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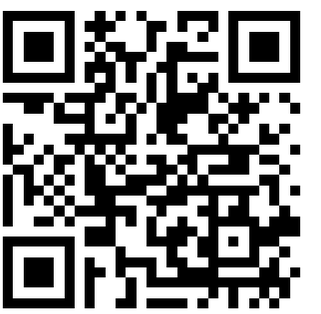

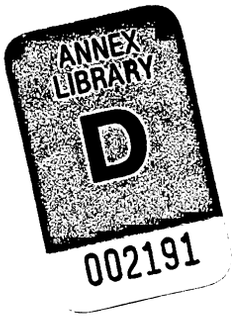

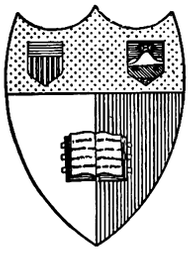

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Electric Railway Journal

Volume 67

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Getting the Most from the Index

This is essentially a subject index, not an index of titles, and articles treating a number of different subjects are listed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about an electric railway are under the name of the city in which the main office of the company is located, but in the case of electrified sections of steam railroads, the entries appear under the name of the railroad.

In the subject index, the alphabetical method is followed. If there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below is a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into fourteen general subjects.

The headings which appear in the index itself are in small type under the general classifications. The main headings in capitals below do not appear in the index. The list of keywords is revised from time to time to keep the index abreast with developments.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question. The reader would therefore refer to this keyword under S in the body of the index.

In addition to the groups of articles covered by these headings, papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short articles about machine tools appear only under the heading "Repair shop practice; shop methods and equipment" and are not indexed alphabetically, because there is a wide choice in most cases of the proper keyword to be used.

Signed articles also are indexed by the name of the author. When the name of the author is known to the reader this provides the simplest method of locating any article.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION
Accident claim department
Accident prevention
Accidents (including wrecks)
Insurance, Fire
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS
Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT
Bearings
Brakes and compressors
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Resistors
Seats
Trolley wheels
Trucks
Wheels and axles

EMPLOYEES
Education
Employees
Insurance and pensions
Strikes and arbitrations
Wage decreases
Wage increases
Wages and working agreements

FARES
Fare collection (including apparatus)
Fare decreases
Fare increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS
Accounting
Appraisal of railway property
Blanks and forms
Discontinuance of lines
Financial (methods of financing)
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

HEAVY ELECTRIC TRACTION
Heavy electric traction (general)
Locomotives

MAINTENANCE OF EQUIPMENT
Car cleaning
Lubrication
Maintenance practice
Motor buses, Practice with
Painting
Repair shop practice; cars and car equipment
Repair shop practice; shop methods and equipment
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

MOTOR BUSES
Motor buses, design
Motor buses, field for
Motor buses, installations
Motor buses, practice with
Motor buses, regulation

POWER
Energy checking devices
Energy consumption
Fuels
Overhead contact system

POWER—Continued
Power distribution
Power generation
Power stations and equipment
Power transmission
Substations and equipment

STRUCTURES
Carhouses and storage yards
Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals and waiting stations

TRACK
Pavements
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRANSPORTATION
Advertising
Customer ownership
Dispatching
Freight and express
Interurban railways
Merchandising transportation
Publicity
Public, Relations with
Rapid transit (elevated and subway)
Schedules and timetables
Signals
Street traffic congestion
Traffic investigations
Traffic regulation
Traffic stimulation
Transportation, Metropolitan (general studies)

MISCELLANEOUS
European practice
Management
Noise reduction
Railways (general)
Snow and ice removal
Standardization
Wood preservation

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INDEX TO VOLUME 67

PAGES BY WEEKS

January 2	1 to 54
January 9	55 to 94
January 16	95 to 140
January 23	141 to 178
January 30	179 to 222
February 6	223 to 272
February 13	273 to 308
February 20	309 to 350
February 27	351 to 388
March 6	389 to 430
March 13	431 to 472
March 20	473 to 532
March 27	533 to 576
April 3	577 to 620
April 10	621 to 660
April 17	661 to 704
April 24	705 to 746
May 1	747 to 788
May 8	789 to 830
May 15	831 to 870
May 22	871 to 910
May 29	911 to 954
June 5	955 to 998
June 12	999 to 1036
June 19	1037 to 1082
June 26	1083 to 1132

A

Accident claim department:
—Claims work reviewed by Safety Council, 512.
—Photography an aid to work of, *65.

Accident prevention (see also Safety work):
—A.E.R.A. Committee report, 1117.
—Attleboro, Mass., Accident record, *719.
—B.-M.T. organizes Accident Prevention Bureau, 860.
—Buffalo, N. Y., Accidents reduced, 324, 807.
—California companies decrease accidents, 976.
—Dallas, Texas, safety record, 541.
—Los Angeles, Cal., Reduction in accidents, 211.
—New Orleans, La., Contest reduces accidents, 736.
—Providence, R. I., Accidents reduced in 1925, 976.
—Rochester, N. Y., Accident reduction contest, 261.
—St. Louis, Mo., Record for 1925, 365.

Accidents (including wrecks):
—Accident faker convicted, 418.
—Germany, Analysis of, 159.
—German tramcar accidents, 990.
—Grand Rapids, Mich., Traffic accidents analyzed, *840.

Accounting (See also Blanks and forms):
—Bus purchase, Indiana, Accounting method specified, 86.
—Control of inventories, Details [Maher], 893.
—Cost accounting prevents excess expenditures [Holden], c724.
—Depreciation as operating expense [Maltbie], 354, 399, 542; Comments on, 390.
—Detailed cost data important [Jordan], c639.
—Erie, Pa., Ticket and coin sorting machine, *889.
—San Francisco ordinance changes accounting methods, 49, 823.

Advertising (see also Merchandising Transportation and Publicity):
—Benefits of advertising service, Comments on, 55.
—Billboard campaign, Providence, R. I., *693.
—Billboards and exterior advertising, Oakland, Cal., Controversy, 734, 860.
—Campaign for fare increase, Syracuse, N. Y., 338.
—Campaign for traffic, Results, Details, Birmingham, Ala., *753.
—Cars carry service ads, Muskegon, Iowa [Blue], *549.
—Freight service advertised, Illinois Traction, *1113.

Advertising (Cont.):
—Industrial advertising prize urged by Harvard, 387.
—Louisville Railway newspaper ads tell need of expansion, 649, 942, 986; Comments on, 956.
—Milwaukee, Wis., One man car service advertised, 1118.
—Necessity for railways to advertise [Budd], 229.
—Newspaper ads used in Baltimore, Md., *550; Comments on, 578.
—Newspaper advertising for increased business, Texas Electric Co., *723.
—Newspaper spreads needed to clear railway-bus situation [Jackson], c597.
—Posters advertise service, Richmond, Va., *724.
—Posters made of scenic photos, Toronto, *278.
—Publicity campaign, Baltimore, Md., 376.
—Signboards on main highways [Walker], *195.
—Service ads in newspapers, Chicago Surface Lines [Gordon], *708.
—Westinghouse ads boost railway service, 470.

Airplane service by P.R.T. from Washington to Philadelphia, 1071.

Akron, Ohio:
—Northern Ohio Traction & Light Co.:
Annual report, 646, 866.
Brake tie rods repairs, *514.
Buses meet emergency situation in railway strike, 902; Comments on, 957.
Buses purchased, 702.
Co-ordinating bus and car maintenance [See], *504.
Employees strike for higher wages, Details, 815, 857, 899, 942; Comments on, 833.
Improvements planned, 139.
Massillon abandonment sought, 376.
Rolling steps for spray painting, *560.
Tax suit, Details, 88.
Truck for street car wrecking [See], *327.

Albany, N. Y.:
—United Traction Co.:
Annual report, 739.
Fare increase hearings, 84, 339, 460, 898, 1118.

Allentown, Pa.:
—Lehigh Valley Traction Co.:
Annual report, 823.
Bus service planned, 378.
Safety campaign, 45.

Alton, Ill.:
—Alton, Granite & St. Louis Traction Co.:
Foreclosure ordered, 867, 904, 949, 1127.
New receiver appointed, 174.

American Automobile Association:
—Bus Division to be organized, 524.

American Electric Railway Association:
—Advisory council:
Local transportation opportunities discussed, 1040; Comments on, 1037, 1038.
Merchandising and modernization discussed, 406; Comments on, 390.
—Annual convention:
Cleveland selected for 1926, 453; Comments on, 433.
Committees appointed, 644.
Exhibit plans made, 604, *744.
Space application blanks sent out, 983.
Street cars exhibit plans, 1129.
—Bureau of information:
Reports available, 78, 291, 412, 690, 856.
—Bus and railway operation, Survey, 1027.
—Committee activities:
Convention committees appointed, 644.
Entertainment, 1067.
Essential features of modern cars, Details, *1086. Comments on, 1083.
Executive, 253, 603, 895.
Location, 77, 125, 291.
Management and operation, 125; Plans [Carbutt], c160; 254.
Manufacturers' executive, 94, 983.
Noise reduction, Work of [Williams], c194; [Graves], c289; [Rasmussen], c324.
Rapid transit, 1067.
Subjects and meetings, 453.
Traffic congestion, 690, 1117.
—Individual and company membership increasing, 291.
—Metropolitan Section:
Bearings discussed at January meeting, 118.
Leaflet appeal for membership, 291; Comments on, 311.
Membership drive, 770.
Transportation, salability discussed, 856.
Steel industry discussed by, 334.
Transportation methods discussed, 454, 644.
—New members elected, 604, 896.
—Poster campaign for manufacturers, *255.
—Publicity campaign to aid manufacturers, 306.
—Public Service Ry. Co. section reorganized, 856.

American Electric Railway Engineering Association:
—Committee activities:
Engineering symbols, 770.
Equipment, 604, 983.
Executive, 124, 205, 255.
Heavy electric traction, 454, 1067.
Manufacturers' engineering, 125, 334, 604.
Power generation and conversion, 690, 1067.

Amer. Elec. Ry. Eng. Assoc. (Cont.):
Power transmission and distribution, 558, 1067.
Special trackwork, 731.
Standardization, 412.
Way and structures, 690, 731.
—Revision of methods of voting on standards, 253; Comments on, 223.

American Electric Railway Transportation and Traffic Association:
—Committee activities:
Accident prevention, 1117.
Bus operation, 123, 896.
Executive, 255.
Merchandising transportation, 123, 1022, 1117.
Traffic congestion, 162.

American Engineering Council:
—New officers elected, 205.

American Engineering Standards Com. (see Standardization):
Report, 518.

American Railway Association:
—Annual meeting, Report, 1062; Comments on, 1039.
—Six-Wheel Co. to exhibit buses and trucks, 997.

American Railway Engineering Association:
—Proceedings and reports, 518.

American Society of Civil Engineers:
—Highway transport discussed, 730.
—Parking restrictions discussed, 982.

American Welding Society:
—Annual meeting, Report, 769.

Anderson, Ind.:
—Indianapolis, New Castle & Eastern Traction Co.:
Receiver sought, 382.
—Union Traction Co.:
Annual report, 823.
Freight trains relieve airplane service, 860.

Appraisal of Railway Property:
—Baltimore, Md., Valuation:
Case analyzed [Maltbie], 69.
Depreciation a factor in, 803.
Proceedings, 459, 523, 696, 904.
—Rochester, N. Y., Reappraisal suit, 309, 568, 1076.

Arbitration (see Strikes and Arbitration):

Atlanta, Ga.:
—Georgia Railway & Power Co.:
Cars ordered, Specifications, 272, 388, 660, 703.
Committee to study "relief petition," 374.
Commutator slotter, Home-made, *766.
Co-ordination with Alabama Power Co., 215.
Credit union, 325, 1010.
Employee organizations and activities, *1009.
Fare increase, Interurban line, 169.
Freight and express service abandonment asked, 461.
Gas furnaces for metal melting, *1016.
Insurance labels on cars, 1049.
Meter test car, Details, *726.
Modern cars replace old types, Details, *874.
Modernization work described in booklet, *630.
Names selected for interurban cars, 261, 734.
Overhead construction and maintenance, Details, *672.
Safety talks for school children, 1073.
Selling rides, Comments on, 57.
Stops eliminated as transit aid, 860.
Ten-cent fare denied, 1026.
Transportation methods, Details, *792.
—Track improvements, 1925, 588.

Attleboro, Mass.:
—Interstate Street Ry.:
Operating methods profitable, Details, *719; Comments on, 707

Augusta, Ga.:
—Augusta-Aiken Railway & Electric Corporation:
Domesticated in Georgia for expansion purposes, 738.
Growth of, Details, *932.
New uses for old rails, *642.

Aurora, Ill.:
—Aurora, Elgin & Fox River Electric Co.:
Cars ordered, Specifications, 910.
Combination carhouse and repair shop, Details [Vernon], *841.
—Chicago, Aurora & Elgin R.R.:
Bond issue offered, 215.
Bond issues called for payment, 525.
Freight development, 797.
Reorganization methods, Details, *357, *439, *593; Comments on, 433.
Sold to Insull, 422.
Track rehabilitation, Details, *392.

Australia:
—Melbourne Tramways:
Three-door car standardized, *402.
—Transit situation, Details, 1028.

Abbreviations: *Illustrated. c Communications.
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

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Austria:
—Electrification extended, Details, *958; Comments on, 999.
—Vienna electrification traffic doubles, 724.
Automobiles (see also Motor buses):
—Competition with railways, Comments on, 142.
—Operating costs, Mobile, Ala., 362.
—Parking affects traffic congestion, Comments on, 622.
—Parking plan extended, Philadelphia Rapid Transit Co., *722.
—Saturation point, Comments on, 749.
—Towing service installed, P.R.T., 1026, Comments on, 1085.

B

Baltimore, Md.:
—Bus passengers transported to center of city, Ruling, 170.
—Railway fares an election issue, 607.
—Traffic survey, Engineers' report, 168, *883, 923; Comments on, 143, 872, 913.
—United Railways & Electric Co.:
Advertising campaign, 376.
Christmas "lucky bags" sold, 210.
Community drive aided by employees, 76.
Financial report, 48.
Group insurance for employees, 609.
Newspaper advertising to sell service, *550; Comments on, 578.
Passengers carried, First quarter, 1925, 866.
Rerouting plan, 335, 1026.
Skip-stops suggested in traffic survey, 168; Comments on, 143.
Valuation findings, 459, 523, 696, 904; Depreciation as a factor, 803; Analysis [Maltbie], 69; Comments on, 55.
Week-end safety drive, 1121.
—Washington, Baltimore & Annapolis Electric Ry:
Annual report, 613.
Fares reduced, 609.
Baton Rouge, La.:
—Baton Rouge Electric Co.:
Bus service to University, *263.
Bearings (see also Lubrication):
—Axle Maintenance of, Comments on, 311.
—Bearing clearance, Effect on gears, *317; Comments on, 311.
—Discussed by Metropolitan Section, A.E.R.A., 118.
—Effect on car noises [Williams], *476.
—Life and lubrication of [Dean], 119.
—Machined fits, Comments on, 831.
—Motor Design, Lubrication and maintenance, [Guynes], 121.
Beaverton, Ore.:
—Southern Pacific Co.:
Parts labeled in storeroom shelves, *329.
Beaver Valley Traction Co. (see New Brighton, Pa.).
Beech Grove, Ind.:
—Bus regulation controversy, 87, 695.
Berlin (see Germany).
Bermuda to have electric railway, 377.
Binghamton, N. Y.:
—Binghamton Railway:
Fare increase controversy, 335.
Birmingham, Ala.:
—Birmingham Electric Co.:
Advertising campaign, Details, *753.
Cars ordered, Specifications, 998.
"Use the Car" campaign, *210.
Blanks and forms:
—Bus maintenance records [See], *504.
—Car schedule reports, *279.
—Charts for Chicago traffic light system [Dewhurst], *536.
—Maintenance record system [Paterson], *497.
—Operator's registe rsheet, *1100.
—Road instructor's daily report form, *631.
—Trolley wire inspection forms, *837.
Bloomsburg, Pa.:
—Bus operated over former railway route, 610.
Bluffton, Ind.:
—Marion & Bluffton Traction Co.:
Purchased by Insulls, 131.
Boise, Idaho:
—Boise Street Car Co.:
Rehabilitation plans, 1123.
Bonding (see Rail joints and bonds).
Book reviews:
—A century of progress, by Delaware & Hudson Co., 303.
—A review of railway operations in 1925, by Julius H. Parmelee, 655.
—Consolidation of railroads, second supplement, 1925, 655.
—Depreciation in public utilities, by Delos F. Wilcox, 655.
—Electric railway engineering, by C. Francis Harding, 824.
—Electric railway practices in 1925, by A.E.R.A., 994.
—Forecasting, planning and budgeting in business management, by Percival White, 655.
—French-English and English-French dictionary by J. O. Kettridge, 824.
—Guiding principles of public service regulation, by Henry C. Spurr, 467.
—Handbook of automotive standards, by Society of Automotive Engineers, 1033.
—Handbook of modern electric railway methods and practices, 1925, by A.E.R.A., 655.
—Labor laws of the United States, 303.
—Pegasus or problems of transportation, by Col. J. F. C. Fuller, 1033.
—Planning problems of town, city and region, by Norman Remington Co., 303.
Book reviews (Cont.):
—Proceedings of fifteenth annual convention, Pacific Claim Agents Association, 303.
—Railway engineering and mantenance cyclopedia, by Simmons-Boardman Publishing Co., 1033.
—Railway track and maintenance, by E. E. Russell Tratman, 655.
—Report of the Third Annual Convention of the Internationaler Strassenbahnund Kleinbahnverein, 1033.
—Safety rules for the installation and maintenance of electric utilization equipment, by Bureau of Standards, 1033.
—Second technical confergnce of the State Utility Commission Engineers, by Dept. of Commerce, 303.
—Signal wiring, by Terrell Croft, 467.
—Statistics of railways in the United States, by Bureau of Statistics, Washington, D. C., 824.
—Super-Power—Its genesis and future, by W. S. Murray, 174.
—The electrician—Annual tables of electricity undertakings, by Benn Brothers, Ltd., 1033.
—Underground General Associated Tramways American tour, 303.
Boston, Mass.:
—Boston Elevated Railway:
Buses in coordinated service, Details [Dana], *757; Comments on, 747.
Car cleaning methods, 116.
Cars ordered, Specifications, 94, 788.
Coal storage for employees, 127.
Crosstown buses well patronized.
Departmental organization, *282.
Financial report, *300, 466; Comments on, 352.
Fr ight car contract approved, 1073.
Public control bill, 418, 458, 523, 605, 691.
Skylight scaffold for building maintenance, *80.
Tension kept on armature wire, *164.
Track improvement plans, 222.
Trolley wire breaks reduced, Details, *837.
Wage negotiations under way, 943.
—Eastern Massachusetts Street Railway Co.:
Dividend payments to be settled by court, 265.
Fares decreased, 736, 899.
Financial condition, Comments on, 273.
Oil handling facilities, *1058.
—Rapid transit recommendations made to legislature, 82.
—Subway route to be studied, 734.
Boston & Maine R. R.:
—Bus service objected to, 861, 1029.
—Competitive bus service denied, 946.
—Electrified branch, Operating proposal, 564.
—Gas-electric cars ordered, 619.
Boston & Worcester Ry. (see Framingham, Mass.
Brakes and Compressors:
—Band and disk, Berlin, Germany [Kindler], *285.
—Brake adjustment, Dead lever guide aids, *372.
—Double rod reduces brake release failures, *456.
—Emergency valve used with air brake, 456.
—Regenerative braking on multiple-unit trains [Aspinwall], 447.
Bridgeton, N. J.:
—Cumberland Traction Co.:
Hot brine clears tracks of snow and ice, 314.
Rehabilitation methods, Details, *144.
British Columbia Electric Ry. (see Vancouver, B. C., Can.).
Brooklyn, N. Y. (see New York City).
Buffalo & Erie Dy. (see Erie, Pa.).
Buffalo, N. Y.:
—Bus bids called for, 1080.
—Bus ordinance proposed, 990.
—Bus situation, 212, 298, 378, 611, 1075.
—Electrification ordinance appealed, 608.
—Gas-electric bus application, 462, 566.
—International Railway Co.:
Accidents decreased, 807.
Annual report, 698.
Armature assembly prevents end play, *1116.
Armature testing block, *1060.
Bus franchises granted, 737.
Loan for reconstruction sought, 987.
Painting destination signs, 849.
Track construction ordered by commission, 46.
Traffic ordinance enforcement campaign, 45.

C

California, State of:
—Bakersfield-Los Angeles interurban electric railway under discussion, 988.
—Motor vehicle registration law unconstitutional, 1029.
Canadian Electric Railway Association:
—Annual meeting, Program, 856; Report, 1019.
Capital Traction Co. (see Washington, D. C.)
Capitalization:
—Non-voting stock discussed, 380, 621.
Car cards (see Publicity)
Car cleaning (see also Maintenance practice):
—Boston, Mass., Methods, 116.
—Cane seats, Machine for cleaning, *81.
Car cleaning (Cont.):
—Car mats cleaned by steam, Detroit, *599.
—Chemical mixture removes paint [Brown], *292.
—Spray washing reduces cost, Cleveland, 629.
Car design (see Cars):
Carhouses and storage yards:
—Aurora, Ill., Combination carhouse and repair shop, Details [Vernon], *841.
Car Lighting (See lighting and lighting fixtures):
Car Signs:
—Steel frames for, Grand Rapids, Mich., *686.
Cars (including design):
—Additional doors speed trailer operation, Cleveland, *630.
—Berlin, Germany, Motor and trailer cars, Details [Kindler], *285.
—British tramways rolling stock improvements, Details, *1109.
—Car design development [Gordon], *427.
—Cars ordered, Specifications:
Alliance, Ohio, 704, 908.
Atlanta, Ga., 272, 388, 660, 703, Details *874.
Aurora, Elgin & Fox River Elec. Co., 910
Birmingham, Ala., 998.
Boston Elevated Ry., 94, 788.
Charleroi, Pa., *575.
Chicago Rapid Transit Co., Details [Lee], *182.
Chicago, South Shore & South Bend R.R., 348.
Chicago Surface Lines, *908.
Columbus Railway, Power & Light Co., *619.
Dallas, Texas, *997.
Detroit, Mich., *574.
East Taunton Ry., *1035.
Fort Smith, Ark., *787.
Grand Rapids, Mich., 786; Details, *914.
Hazelton, Pa., *703.
Hobart, Ind., *745.
Miami Beach Ry., 54.
Montreal Twys, 830, 870, 952.
Philadelphia Rapid Transit Co., *952.
Portsmouth Public Service Co., *426.
Providence, R. I., *471.
Richmond, Va., 532, 703, *953.
Seattle Municipal Ry., 620.
Tampa Electric Co., 140.
Youngstown Municipal Ry., *659.
—Chicago, Aurora & Elgin R.R., Details, *439; Comments on, 433.
—Design wanted by public [Williams], *669.
—Double-deck tramcars, South Africa [Edward], *403.
—Essential features of modern cars, A.E.R.A. report, *1086, Comments on, 1083.
—Ferry car for flooded car tracks, Design, 189.
—Floor coverings for, Comments on, 309.
—Freight trailers standardized, Specifications, *237; Comments on, 225.
—Gas-electric:
St. Louis Car Co., builds for Seaboard Air Line, Details, *220.
—Grand Rapids Ry., New Cars, Details, *914; Comments on, 911.
—Hinged aprons on cars, *326.
—Improvements in design,—Possibility of [Master Mechanic], c160; Comments on, 309.
—Manufacturers should develop design, Comments on, 55.
—Meter test car, Atlanta, Ga., *726.
—Miami, Fla., New cars, Features of, *283.
—Modern cars essential [Gordon], 233.
—Modern cars increase traffic, Morristown, N. J., *763.
—Motor car for hauling trailers, Swiss electrification, *321.
—Names substituted for numbers, Comments on, 310.
—New cars desirable, Comments on, 351.
—One man:
Augusta, Ga., *932.
Buffalo & Erie Ry., *58; Comments on, 56.
Dayton, Ohio; Case appealed, 608.
Des Moines, Iowa, Controversy, 1119.
Milwaukee, Wis., 294, 897, 1068.
New Jersey board favors, 735.
Pueblo, Colo., Cars remodeled for one-man operation, *970.
Toronto, Can., Design, Details, *98
—Orders during 1925 analyzed, Statistics, *19; Comments on, 3.
—Painting (see Painting):
—Passenger cars classified by age, Statistics, *25; Comments on, 2.
—Peter Witt cars, Dallas, Tex., Details, *750.
—Pittsburg Ry. new cars, Comments on, 578.
—Platform equipment enclosed in casings, *1116.
—Remodeled cars, Houston, Texas [Bennetté, *1098.
—Remodeled subway cars, London, England, *1050.
—Sheffield, England, Anti-glare glass for, 289.
—Step heights, Comments on, 95.
—Steps, Visible edge, *516.
—Three-door car adopted as standard, Melbourne, *402.
—Toronto, Can., Remodeled cars, Details, *98.
—Tram cars, European cities [Spectator], *147.
—Type of equipment attracts patrons [Harvie], 197.
—Types of cars in use, 1925 statistics, *19; Comments on, 3.
—Windshield wipers for, 129.
—Wooden models show car construction, Grand Rapids, Mich., *806.
—Zanesville, Ohio, New cars, Details, *396.
Car steps, New type, *516.

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Cedar Falls, Iowa:
—Waterloo, Cedar Falls & Northern Ry.:
Operating statement, 3 years, 382.
Central Electric Railway Association:
—Annual meeting:
Boat trip plans announced, *689.
Foreman conference demonstration, 244; Comments on, 223.
Program, 77, 1021.
—Freight trailer equipment standardized, Specifications, *237; Comments on, 225.
—Midwinter meeting:
Running report, 244; Comments on, 223.
Central Electric Railway Master Mechanics Association:
—Meetings, Running reports, *331, 894.
Central Electric Traffic Association:
—Constitution to be amended, 770.
—Penny coupon tickets considered, 769.
Charles A. Coffin Prize:
—Advantages of competing for, Comments on, 748.
—"Journal's" analysis of 1925 presentation commended [Bolt], c76.
—N. E. L. A. award, 898; Comments on, 872.
Charlotte, N. C.:
—Piedmont & Northern RR.:
Articulated locomotive built, Design, *156.
Chattanooga, Tenn.:
—Tennessee Electric Power Co.:
Signal operation and maintenance, *685.
Chautauqua, N. Y.:
—Chautauqua Traction Co.:
Chautauqua Institution refuses to finance, 297.
Service abandoned, 342, 608.
Student service tender guarantee agreement, 211.
Chester, Pa.:
—Cab service acquired by railways, 1124.
Chicago, Aurora & Elgin R.R. (see Aurora, Ill.).
Chicago, Ill.:
—Aldermen tour to inspect transit conditions, 772.
—Appropriations made for loading platforms, 1024.
—Chicago City & Connecting Rys.:
Governing body to act as protective committee, 864.
—Chicago & Northwestern Ry.:
Oil-electric locomotive delivered, 869.
Reorganization plan, 654.
—Chicago Railways:
Federal Court restrains 5-cent fare order, 943.
—Chicago Rapid Transit Co.:
Annual report, 379.
Expansion progress, 417.
Insurance plan popular with employees, 238, 438.
New cars, Design, Details [Lee], *182.
Wage increase asked, 857.
—Chicago Surface Lines:
Accident prevention contest, 461.
Armature baking, Details [Jorgensen], *501.
Armature testing decreases open circuits [Wheeler], *834.
Cars ordered, Specifications, *908.
City's lawsuits decided in favor of railway, 735.
City's share of earnings paid, 820.
Co-ordinated lights and rerouting speed up traffic [Dewhurst], *536; Comments on 577.
Financial reports, 651, 906.
Franchise negotiations, 259, 859, 899, 988, 1025, 1121.
Holiday traffic record, 112.
New cars, Purchase authorized, 786.
Overhauling for holiday service, Details [Adams], *188.
Protective committees formed, 215, 613.
Public relations improved, Methods, Details [Gordon], *708.
Seven-cent fare upheld, 523.
Spray painting of cars, Methods [Wheeler], *206.
Storm service praised by press, *648.
Substation ordered, 786.
Use of idle funds sought, 1118.
—Cleveland railway and police inspect traffic signals, *541.
—Department stores check on customers using parking space, 722; Comments on, 707.
—Illinois Power & Light Corp.:
Annual report, 1125.
Dividend rate to be changed, 866.
Preferred stock increased, 380.
Wage arbitration, Peoria, Ill., 945.
—Illinois Traction, Inc.:
Door-to-door freight and express service begun, 86.
Freight service advertised, *1113.
Light-weight cars reduce operating expense, *1086.
Personnel changes, 868.
Stock sale, Results, 1077.
Wage increase, 45, 169.
—Merchants interviewed on proposed subway, 460.
—Railway securities analyzed, 821.
—Railways, Progress during 5 years [Budd], 229.
—School regulations expedite car loading, 376.
—Terminal electrification discussed, 1122.
—Traction franchise ordinance progress, 127, 418, 565, 734, 940, 1025.
—Traffic signals, Effect on railway operation [Miller], *580.
—Transportation methods census, 900.
Chicago, Milwaukee & St. Paul R.R.:
—Copper used in electrification [Beeuwkes], 1042.
—Cost of electrification [Dynes], c933.
—Electric locomotive test, 185.
—Financial affairs discussed, 733; [Dynes], c933.
Chicago, Milwaukee & St. Paul R.R. (Cont.):
—Rail bond maintenance, Details [Lovell], *312.
Chicago, North Shore & Milwaukee R.R. (see Highwood, Ill.):
Chicago, South Shore & South Bend R.R. (see Michigan City, Ind.).
Cincinnati & Dayton Traction Co. (see Hamilton, Ohio.)
Cincinnati, Ohio:
—Cincinnati, Milford & Blanchester Traction Co.:
Operating plans, 984.
Sold to Cincinnati Street Ry., 1031.
—Cincinnati Street Ry.:
Advertising emblem sought, 461.
Bus order, 348.
Co-ordinated bus service, Details, *107.
Financial reports, 264, 905.
Holiday pass plan considered, 608.
Milford line bought, 1031; operation resumed, 1121.
New Mack buses have special type seats, *576.
Personnel changes, 304.
Rapid transit and bus proposals, 567.
Track reconstruction project, 618.
—Ohio Traction Co.:
Distribution of assets arranged, 822, 948.
Liquidation in progress, 653.
—Rapid transit system, Construction progress, 647.
—Street railway department to be expanded, 563.
—Traffic survey to be made, 1123.
Circuit breakers (See Electrical equipment for Cars):
City planning:
—Coral Gables, Fla., Electric railway relied on, Comments on, 56.
—Practical plans necessary, Comments on, 957.
—Relation to transportation, Comments on, 224, 871.
—Zoning method, Growth, Comments on, 873.
City Railway (see Dayton, Ohio).
Claim department (see Accident claim department):
Cleveland, Ohio:
—Cleveland Railway:
Additional doors speed trailer operation, *630.
Co-ordinated railway and bus operation, Details, *545; Comments on, 534.
Franchise negotiations, 607, 648, 691, 771; Comments on, 789.
Leather seats prove popular, *844.
New uniforms for trainmen, 797.
Power generation on substation basis, [Bale], 714.
Spray washing reduces car cleaning costs, 629.
Stock sale planned for improvements, 336.
Track crossings reduce noise, *511.
Traffic report, *589.
Trainmen make safety suggestions, 927.
Wages increased, 988.
—Lake Shore Electric Ry.:
Power properties sold, 738.
—Merchants make traffic survey, 1025.
—Subway ordinance proposed, 44.
Coal (see Fuels and Market conditions):
Coffin Foundation (see Charles A. Coffin):
Columbia, S. C.:
—Bus operation authorized, 47.
—Columbia Railway, Gas & Electric Co.:
Transit program adopted, 1071.
Zone fare changes, 211.
—Transit situation, 562, 815, 1071.
Columbus, Ohio:
—Columbus Railway, Power, & Light Co.:
New cars ordered, Specifications, *619.
Power contract, 128.
Community Traction Co. (see Toledo, Ohio).
Connecticut Co. (See New Haven, Conn.):
Conspectus of Indexes, 173, 380, 569, 739, 949, 1126.
Copper used in C.M.&St.P. Ry. electrification [Beeuwkes], 1042.
Coral Gables, Fla.:
—Trolley used in community planning, Comments on, 56.
—Coral Gables Rapid Transit Co.:
Opening scheduled for April, 607.
—Public utilities purchased by Florida Power & Light Co., 654.
Culverts at stations, Los Angeles, *163.
Cumberland Traction Co. (see Bridgeton, N.J.).
Current collection:
—Maintenance of equipment reduced, Ft. Worth, Tex., *1048.
Customer ownership (see also Public, Relations With):
—Philadelphia Rapid Transit Co., Stock sale, Details, *437.

D

Dallas, Tex.:
—Dallas, Ry.:
Cars ordered, Specifications, *997.
Chemical mixture removes paint [Brown], *292.
Fare increase, 296, 419, 691; Comments on, 391.
Franchise situation, Comments on, 790.
Improvement program, 691.
Merchandising transportation, Methods [Dewhurst], *879.
Service extension plans, Details, *750.
Dallas, Tex. (Cont.):
—Texas Electric Ry.:
Annual report, 568; Comments on, 432.
Dividends deferred, 777.
Newspaper advertising to increase business, *723.
Safety contest reduces accident cost, 630.
Safety record, 541.
Selling service, Methods [Dewhurst], *879.
Wheel grinding equipment, *1059.
Danbury, Conn.:
—Danbury & Bethel Street Ry.:
Name changed, 1079.
Reorganization, 173, 696, 821.
Taxes remitted, 49.
Davenport, Iowa:
—Tri-City Railway:
Trainmen sign register after reading bulletins, *1100.
Dayton, Covington & Piqua Traction Co. (see West Milton, Ohio).
Dayton, Ohio.:
—City Railway:
One-man car ruling appealed, 85, 608.
Personnel changes, 383.
Delaware & New Jersey Transportation Co.:
—No-par non-voting stock issue denied, 653; Comments on, 621.
—Stock issue allowed, 697.
Denver, Colo.:
—Denver Tramways:
Axle bearing storage, 257.
Cars to be painted solid colors, 110.
Dashboard signs boost city, *986.
Financial reports, 266.
Manganese special trackwork, Maintenance, 292.
Motors, Old type, Improvements in, 164.
Pavements, Filling cracks in, *79.
Trolley wheel bushing press, *115.
—Picturesque railway abandoned, 860.
Depreciation (see Appraisal of railway property or Financial).
Des Moines, Ia.:
—Bus franchise sought, 737.
—Des Moines City Ry.:
Annual report, 782.
Cross-town bus service installed, 990.
One-man car controversy, 1119.
Rolling stock maintenance [McMahon], *483.
Sunday passes installed, 989, 1073.
Transit situation outlined, 605.
—Street railway commissioner attacked, 987.
Detroit, Mich.:
—Cable installed for city service, 138.
—Department of Street Railways:
Air-operated clamp for drill press, *810.
Axle dustguards for motors, *726.
Bids for car and bus equipment, 387, 574, 658, 702.
Bonding plan for purchase of rolling stock disapproved, 692.
Buses rented from D. U. R., 348.
Bus order, Specifications, 471, 829.
Car mats cleaned by steam, 599.
Car sign painting, Methods, *455.
Cars ordered, Design, *574.
Car stops, 850 eliminated, 1120.
Cleaning and blowing out controllers, *848.
Corrosion eliminated on air reservoir glands, *643.
Employees protest change of hours, 261.
Fare increase under consideration, 83.
Financial reports, 132, 381, 570, 739.
Loan made to city, 993.
Motor cleats prevent short circuits, *849.
Operating speed increased, *356.
Paint brushes kept in good condition, *977.
Paint storage, Details, *1059.
Plate glass protects lathe operator, *767.
Platform equipment inclosed in casings, *1116.
Wire brush cleans wheels, *1115.
Pneumatic tires on acetylene welding truck, *934.
Rehabilitation of equipment needed, 94.
Rerouting plans, 166, 860.
Rolling stock expenditures planned, 337.
Salary increases, 169.
Service changes, 260.
Shop furniture standardized, Comments on, 831.
Silk screen sign painting, Press for, *1016.
Tire equipment on mileage basis, 470.
Traffic congestion discussed [Wallace], 369.
Truck overhauling, Drill for, *891.
Wage increase, 337, 898, 1119.
—Detroit United Ry.:
Cars added to combat buses, 84.
Car colors changed, 167.
Express bus service begun to Toledo, 695.
Improvement plans, Details, 209.
Paving costs assumed by Ecrose, Mich., 815.
Reorganization plans, 342.
Special limited service begun, 460.
—Highway plans progressing, 43.
—Jitney regulation right upheld, 692.
—Monorail overhead experimental line to be constructed, 336, 988.
—Rapid transit plan, 261.
Dick Prescott, *115, *328, *513, *683, *847, *1057.
Discontinuance of lines:
—Abandonments in 1925 reviewed, Statistics, *15; Comments on, 3.
—Brownsville Street & Interurban R.R., 524.
—Chautauqua Traction Co., 342, 607.
—Cleveland, Painesville & Eastern R. R., 527.
—Denver & South Platte Ry., 776.
—Hartford & Springfield Street Ry., 1077.
—Hornell Traction Co., 947, 991.
—Newton, Mass., 47.
—New York & Long Island Traction Co., 653.
—Ontario, Canada, Suspensions, Comments on, 56.

Abbreviations: *Illustrated, c Communications.
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

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Discontinuance of lines (Cont.):
—Replacement by buses, Extent of, 242.
—St. Thomas, Ontario, Canada, 84.
—Westchester Street Ry., 821.
Dispatching:
—Asbestos lumber dispatching booths, *978.
—Skokie Valley line, Highwood, Ill., *1043.
—Telephone dispatching:
East Liverpool, Ohio, *1101.
San Antonio, Texas [Dewhurst], *929.
Doors, car:
—Aluminum sliding doors, *208.
—Handle fits for, *413.
—Treadle:
Grand Rapids Ry., new cars, *914.
Toronto cars, one-man, *98.
Drawbridge closing during rush hours asked, New Jersey, 563.
Dubuque, Iowa:
—Dubuque Electric Co.:
Carhouse remodeled as garage, Details [Smith], *186.
Duluth, Minn.:
—Duluth Street Ry.:
Regulation bill held valid by Supreme Court, 901.
—Duluth-Superior Traction Co.:
Annual report, 463.

E

Eastern Massachusetts Street Railway Co. (see Boston, Mass.).
East Liverpool Ohio:
—Steubenville, East Liverpool & Beaver Valley Traction Co.:
Rehabilitation methods, Details, *1101.
Easton, Pa.:
—Easton Transit Co.:
Bronze tablet in commemoration, 1008.
East St. Louis, Ill.:
—East St. Louis Ry.:
Fare increase, 336, 523.
—East St. Louis & Suburban Ry.:
Fare increase, 169, 339.
Education:
—Co-operative colleges further engineering education, 895.
—Foremen conferences, Comments on, 97.
—French exchange professorship, 252.
—Industrial, As applied to rubber manufacturing [Ching], 77.
—Personnel selection and training Milwaukee [Dewhurst], *624; Comments on, 622.
—Promotional work, Brooklyn Edison Co., 78.
—Training executives from the rank and file [Danforth], 200; Comments on, 181.
—Training platform men:
New Orleans, La., *631.
New York City, Details [Segard], *1105.
—Yale offers transportation fellowship, 184.
Eighth Avenue Railroad Co. (see New York City).
Electrical equipment for cars (except motors):
—Circuit breakers:
High-speed breaker, *935.
Interborough, Details, *152.
Multi-pole oil-tight breaker, *456.
Sectionalizing switch for spur tracks [Appel], *329.
Testing and maintenance [McMahon], *483.
—Locomotive-car, Switzerland, Details, *321.
—Noise reduction aided by electrical dept. [McKelway], *481.
Elevated railways (see Rapid transit).
Electrification (see Heavy electric traction).
Electric Railway Association of Equipment Men, Southern Properties:
—Annual meeting, Report, *408.
—Ohio Brass Co. exhibit, *470.
Electric Railway Journal:
—Annual Maintenance Number commended [Budd], [Buffe], [Reid], [Coates], [Dana], c596; [Thompson], [Wallace], c639; [Draper], [Holden], c682; Comments on, 661.
—Journal suggestions of use to industry [Drew], c724.
El Paso, Tex.:
—El Paso Electric Ry.:
Fire gong at railway clubroom, 76.
Properties sold, 738.
Public safety demonstration, 1098.
Rail-bus service to lower Rio Grande Valley, 212.
Selling service, Methods [Dewhurst], *929.
Trolley wire breaks overcome, 116.
Emergency Wagons (see Service and tower trucks).
Employees (see also Strikes and arbitration, and Wages):
—Berlin, N. H., Management entertains, 297.
—Bonus to trainmen, Los Angeles, 127.
—Christmas celebrations, Comments on, 224.
—Christmas party for, Louisville, Ky., 167.
—Conductor wins service award, Louisville, Ky., 735.
—Co-operation, Methods to secure [Segard], *999; Comments on, 181.
—Credit union organized, Atlanta, Ga., 325, 1010
—Development of administrative ability builds morale, Comments on, 143.
—Educational courses, Southern Properties, *408.
Employees (Cont.):
—Eight-hour bill killed in Mass., 419.
—Employes solicit freight, Jackson, Mich., 918.
—Engineering department organization, New Orleans [Paterson], *497.
—Foreman conference demonstration, 244; Comments on, 223.
—Insurance handled by employees, Kansas City, Mo., 772.
—Labor problems of General Electric Co. analyzed, 701.
—Locomotive operator an engineer, not motorman [Booth], c76.
—Mutual Aid Association meets, Utah, 338.
—Organizations and activities, Atlanta, Ga., *1009.
—Pension plan considered in Portland, Ore., 338.
—Personnel selection and training, Milwaukee [Dewhurst], *624; Comments on, 622.
—Promotion system, Los Angeles, 402.
—Public relations work by [Storrs], 554.
—Safety bonuses awarded, San Diego, Cal., 262.
—Safety record, Manchester, N. H., *260.
—Selection and training methods, Philadelphia, Pa., *971.
—Suggestion Department, Pittsburgh, Pa., 843; Comments on, 833.
—Training platform men, New Orleans, La., *631.
—Welfare fund, Minneapolis, Minn., 1122.
—Woman's place on utility staff [Steiner], 252.
—Veterans' wives awarded passes, Wheeling, W. Va., 288.
Engineers:
—Engineer as title for locomotive operator [Booth], c76.
—Future executives from engineering profession, 689; Comments on, 662.
England (see Great Britain).
Erie, Pa.:
—Buffalo & Erie Ry.:
Air compressor noises reduced, *848.
Bus line proposed in New York, 340.
Flexible trolley base reduces noise, *977.
High-speed service increases business, Details, *58; Comments on, 56.
—Erie Railways:
Aluminum protection for seat ends, *1059.
Armature rack made from rails, *767.
Board shows location of cars, *849.
Bolster guides improve car riding, *890.
Disc grinding motormen's valves, 850.
Ford truck for sanding track, *684.
Hose used as buffer in dipping tank, 978.
Motormen's seat, Adjustable, *811.
Ticket and coin sorting machine, *889.
Erie Railroad:
—Gasoline-electric train built for, 140.
European Practice (see also different countries):
—Cutting worn-out tires from wheels, *811.
—Rail corrugation studies, 1056).
—Rail welding, Thermit [Tinnon], c597.
—Tramway conditions and practices [Emery], *363.
—Tramway operation, Observations on [Spectator], *147.
—Wages on electric railways, 365.
Evansville, Ind.:
—Evansville Suburban & Newburgh Ry.:
Business men will help preserve line, 461.
Exeter, N. H.:
—Exeter, Hampton & Amesbury Street Ry.:
Property to be sold at public auction, 994.
Express (see Freight and Express).

F

Fairmont, W. Va.:
—Monongahela-West Penn Public Service Co.:
Schedule speed reduced, 68.
Fare boxes, Repair practice, *326.
Fare collection:
—Advance in methods of, 869.
—Buffalo & Erie Ry., Methods, *58; Comments on, 56.
—Change making by conductors, Comments on, 275.
—Entrance signs, Providence, R. I. *371.
—Portland, Me., Ticket collecting method changed, 210.
—Sunday pass:
Allegheny Valley Street Ry. installs, 298.
Des Moines, Iowa, Installation, 989, 1072.
Trenton, N. J., Abolished, 565.
Wheeling, W. Va., Interstate, 210.
—Token clearing house needed [Speed], c596; [Sherion], c682; Comments on, 579.
—Toronto, Methods, Details, *98.
—Weekly pass:
Wheeling, W. Va., 772.
—Zone fare system, Java [Balsem], *191.
—Zone fare system, South Africa, *403.
Fare decreases:
—Atlantic, Mass., 899.
—Boston, Mass., 756.
—Capital Traction Co., bus, 46.
—Columbia, S. C., Zone fares, 211.
—Highwood, Ill., Commutation rates, 901.
—Pacific Electric Ry., 691.
—St. Louis, Mo., Bus competition reduces fares, 171.
—Washington, Baltimore & Annapolis Elec. R.R., 609, 861.
—Washington, D. C., Bus, 86, 87.
—West Penn Rys., Revenue increased by [Horton], 243.
Fare increases:
—Atlanta, Ga., Interurban line, 169.
—Belleville, Ill., 169, 339.
—Dallas, Texas, 296, 419, 691; Details, *750.
—East St. Louis Ry., 336, 523.
—Evanston, Ill., Bus, 903.
—Evansville, Ind., 462.
—Indianapolis & Cincinnati Traction Co., Bus fares, 651.
—Indianapolis, Ind., Transfer charges, 169.
—Joplin & Pittsburg Ry., 46, 169.
—Louisville, Ky., 259, 420; Bus, 737.
—Minneapolis, Minn., Details, 82.
—Oakland, Cal., 126.
—Philadelphia Rapid Transit Co., Commission report, Details [Dewhurst], *157; Comments on, 141.
—Rochester, N. Y., 128.
—San Francisco and Berkeley, Cal., Controversy, 336.
—Shreveport, La., 1025.
—Sioux Falls, S. D., 774.
—South Bend, Ind., 462; Bus, 340.
—Spokane, Wash., 44, 211.
—Utah Light & Traction Co., 944.
—Washington, D. C., Buses, 379.
—Webb City, Mo., 861.
—Wheeling, W. Va., 945.
Fares:
—Authority of courts in rate cases, 126.
—Average railway fares, A.E.R.A. report, 651.
—Bus, Determination of fair rates [Smith], 250.
—Cleveland, Ohio, Survey of, *589.
—Double fare necessary for bus to handle all traffic, Berlin, Germany, 1011; Comments on, 1000.
—Fare trend, Details [Nash], 965.
—Federal rate interference petition, New Jersey, 419.
—Increases necessary, Comments on, 1001.
—Length of ride governs [Coates], 245.
—Mansfield, Ohio, More passengers with higher fare [Jackson], 975.
—New fare ordinance, Dallas, Tex., Details, *750.
—N. Y. State Rys., Controversy over increase, 335.
—St. Louis, Increase requested, Details, 1023.
—Token clearing house needed [Speed], c596; [Sherion], c682; Comments on, 579.
—Tokens sold in Christmas bags, Baltimore, Md., 210.
—Transfer privileges curtailed, Seattle, Wash., 649.
—Trend in 1925 [Richey], *37; Comments on, 2.
—Utica, N. Y., Fare hearing, 605, 691.
Financial (see also Statistics, Reports, Financial):
—Auburn & Syracuse Electric R.R., Financial condition, 904.
—Bond issue, Associated Electric Co., 696.
—B.-M.T. financial structure, Comments on, 96.
—Budgetary control for railways, Details [Patten], *1063.
—Buses operated at loss, Tampa, Fla., 902.
—Cedar Falls, Iowa, railway outlook improved, 382.
—Chicago, Aurora & Elgin R.R., Reorganization Methods, Details, *357.
—Chicago railway securities analyzed, 821.
—Cleveland plans stock sale, 336.
—Coral Gables, Fla., public utilities sold, 654.
—Credit situation improving [Storrs], 226; Comments on, 225.
—Detroit Municipal Ry., makes city loan, 993.
—Detroit United bond trading, 569.
—Dividend payment controversy, Boston, Mass., 265.
—Expenditures for improvements, Dallas, Tex., *750.
—Expenditures, Railway estimate, 1926, *5; Comments on, 4.
—Foreclosures (see also Reorganization under Financial):
Alton, Granite & St. Louis Traction Co., 867, 904, 949, 1127.
Cincinnati & Dayton Traction Co., 213, 464.
Cleveland, Painesville & Eastern R.R., 527.
Cumberland & Westenport Electric Ry., 1127.
Hartford & Springfield Street Ry., 266, 569, 782.
Kansas City Rys, 48, 88, 948, 1076.
Long Island Electric R.R., 423.
New York & Long Island Traction Co. 343, 423.
Painsville & Ashtabula Electric R.R., 1078.
Review of 1925, statistics, *41.
—Holding company financing, Comments on, 747.
Indianapolis & Northwestern protective committee formed, 1125.
—Methods of obtaining capital, Comments on, 431.
—Middle West companies merge, 1125
—Mortgage bond sold, North Shore line, 1126.
—New Jersey State Board denies no-par non-voting stock issue, 653; Comments on, 621.
—Philadelphia, Pa., Capital stock increased, 172.
—Proposed electric railway expenditures in 1926, Ohio 306.
—Protective committees appointed for Indianapolis & Cincinnati Traction Co., 570.
—Railway costs and fares stable in 1925 [Richey], *37; Comments on, 2.
—Railway outlook, 1925 reviewed, *13; Comments on, 4.
—Receiverships:
Record for 1925, Statistics, *41.
Red Star Bus Co., 1075.
Rockford Electric Co., 382.
Rockford & Interurban Ry., 382.

Abbreviations: *Illustrated. c Communications.
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

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Financial (Cont.):
—Reorganizations:
Chicago, Aurora & Elgin R.R., Details, *439; Comments on, 433.
Chicago, Peoria & St. Louis R.R., 654.
Cincinnati & Dayton Traction Co., 213, 464.
Cincinnati, Hamilton & Dayton Ry., 696.
Cleveland, Painesville & Eastern R.R., 174.
Danbury & Bethel Street Ry., 173, 696, 821, 1079.
Detroit United Ry., 342.
Fort Wayne, Van Wert & Lima Traction Co., 1030.
Graybar Electric Co., 786.
Hartford & Springfield Street Ry., 266.
Joplin & Pittsburg Ry., 738.
Kansas City Rys., 88, 422, 740, 864, 1125.
Laconia Street Ry., 948.
Nelsonville-Athens Electric Ry., 338.
Rockford, Beloit & Jonesville R.R., 1032.
Steubenville, East Liverpool & Beaver Valley Traction Co., Details, *1101.
United Railways of St. Louis, 84, 131, 342, 422, 568, 653.
—Rockford, Ill., Receiver's rights questioned, 865.
—St. Louis securities, Trading in, 866.
—Standard Gas & Electric merger, 654.
—Stock depression explained, 613.
—Texas Electric Co. defers dividends, 777.
—Trust certificates sold for equipment, 342.
Fire Protection:
—Gong at railway Clubroom, 76.
Fires (see Storm and fire damage).
Flood in Pennsylvania, 562.
Florida, State of:
—New electric road planned, 418.
Foreclosures (see Financial).
Foreign practice (see European practice).
Fort Dodge, Iowa:
—Local car line to be restored, 944.
Fort Smith, Ark.:
—Fort Smith Light & Traction Co.:
Cars ordered, Specifications, *787.
Fort Wayne, Ind.:
—Fort Wayne, Van Wert & Lima Traction Co.:
Reorganization plan, 1030.
—Hotel furnishes guests with trolley schedules, 765.
Fort Worth, Tex.:
—Northern Texas Traction Co.:
Overhead system, Maintenance reduced, *1048.
Selling service, Methods [Dewhurst], *879.
Transportation for convention delegates [Rowe], *1108.
Trolley wire inspection, 79.
Framingham, Mass.:
—Boston & Worcester Street Ry.:
Bus operation by employees, 990, 1124; Comments on, 1000.
Franchises:
—Chicago, Ill., Negotiations, 734, 899, 940, 988, 1025, 1121.
—Chicago Surface Lines, Outlook for new franchise agreement [Gordon], *708.
—Cleveland, Ohio, Negotiations, 607, 691, 771, 789.
—Dallas, Texas, New franchise, Comments on, 790.
—Definition of, Comments on, 955.
—Hamilton, Ont., Electors approve, 859.
—Indeterminate permit, Wisconsin's experience with [Gettle], 980.
—Indiana, Indeterminate permit rights, 1072.
—Kansas City, Kan., Discussion, 295.
—Kansas City, Mo., Negotiations, 944, 984, 1024.
—Little Rock, Ark., Amendment permits improvements, 169.
—Louisville Ry., advertises needs, 986; Comments on, 956.
—Ohio Blanket bus permit denied, 1074.
—Omaha, Neb., New franchise before voters, 735; Result, 899.
—Ontario, Canada, Franchise negotiations, 732.
—Recent franchises more flexible, Details [Nash], 965.
—Richmond, Va., Negotiations, 83, 772, 858, 899, 939, 984, 1023, 1073.
—St. Louis, Mo., Negotiations, 166, 209, 259, 521, 646, 693, 900, 944, 987, 1122.
—San Francisco, Cal., Ordinance revises accounting, 823.
—Sioux City, Iowa, New, 128.
—Terminable permit urged by Illinois senator, 1068.
—Terminable permits, Comments on, 179.
—Toledo, Ohio, Traffic report basis for new franchise, 943.
—Waukesha-Milwaukee franchise, 338, 565.
Freight and express:
—Aurora, Ill., Freight development, 797.
—Buffalo & Erie Ry, freight development, *58; Comments on, 56.
—Illinois Traction:
Door to door service provided, 86.
Light truck for express delivery, *963.
—Jackson, Mich., Employees solicit freight, 918.
—Milwaukee, Wisc., New freight line authorized, 461.
—Union Traction Co. freight service, 860.
Fuels:
—Coal and fuel oils, World production, 1925, 745.
—Coal bill will be reported, 952.
—Coal, Importance of continuous supply, Comments on, 96.

G

Garages:
—Carhouse rebuilt for garage, Akron, Ohio [See], *504.
—Carhouse remodeled as garage, Details [Smith], *186.
—New Orleans, La., Details [Paterson], *497.
Gary, Ind.:
—Bus service plans, 819.
—Gary Street Ry.:
Annual report, 422.
Gears and pinions:
—Bevel gear and worm drives, Germany, *1053.
—Excessive spacing causes trouble, Details, *317; Comments on, 311.
—Gaging gears and pinions for wear, Details [Sawtelle], *323.
—Maintenance practice increases life, England [Roberts], *1051; Comments on, 1039.
—Reducing gear noise, Details [Sawtelle], *184.
Georgia Railway & Power Co. (see Atlanta, Ga.).
Germany:
—Berlin bus situation [Pforr], *c725; Comments on, 706.
—Berlin Street Railway:
Motor cars and trailers, Design, Details [Kindler], *285.
—Bevel gear and worm drives on railway cars, *1053.
—Bonding by zinc coating, *1060.
—Street car accidents analyzed, 159, 990.
—Traffic handling, Bus vs. railway, Cost, 1011; Comments on, 1000.
Grand Rapids, Mich.:
—Grand Rapids Ry.:
Acetylene welding truck, *978.
Annual report, 215, 905.
Bolt rack in overhauling shop, *1115.
Boy Scout car dedicated, *584.
De luxe cars to be delivered soon, 786.
Hinged aprons on cars, *326.
Hose for burning paint off cars, *727.
New cars, Design, Details, *914; Comments on, 911.
Parade of new cars, Details, *1069; Comments on, 1039.
Steel frames for car signs, *686.
Storage of trolley catchers, *890.
Turntable speeds sash painting, *935.
Waste cans for uniform saturation, *1018.
Winning public good will, Methods [De Lamarter], 247.
Wooden models show car construction, Details, *806.
—Traffic accidents analyzed, *840.
Great Britain:
—Central London Ry.:
Cars remodeled, Details, 1050.
—Bus service reduced to relieve congestion, *635, 736; Comments on, 623.
—General strike, Transportation facilities provided, 817, *940; Comments on, 911.
Lost property curiosities, 722; Comments on, 873.
Soft seats for riding comfort, 284.
—London Underground Ry.:
Power station extended, 600.
—Metropolitan District Ry., London:
Traction recorder for car operation tests [Swan], *845.
—National electricity supply plan, 377.
—Rolling stock improvements, Details, *1109.
—Southern Railway of England:
Gears and pinions, Maintenance [Roberts], *1051 Comments on, 1039.
Groton, Conn.:
—Groton & Stonington Street Ry.:
Status explained, 464.
Guelph, Canada:
—Guelph District Rys.
Municipal control of railway favored, 127.

H

Hamilton, Ohio:
—Cincinnati & Dayton Traction Co.:
Bus operation planned, 524.
Foreclosure sale, 213.
Reorganization arranged, Details, 464.
Hamilton, Ont.:
—Hamilton Street Ry.:
Agreement with city averts abandonment, 84.
Franchise negotiations, 732, 859.
Hampton, Va.:
—Newport News & Hampton Railway, Gas & Electric Co.:
Retiring president honored, 419.
Sold to Fitkin, 173, 300.
Harrisburg, Pa.:
—Harrisburg Railways Co.:
Pull-in record, March, 674.
Hartford & Springfield Street Ry. (see Warehouse Point, Conn.).
Havana, Cuba, West Indies:
—Havana Electric Railway, Light & Power Co.:
Woodworking department, Work of, Details [Gottschalk], *113.
Hazelton, Pa.:
—Lehigh Traction Co.:
Cars ordered, Specifications, *703.
Installing and removing semi-elliptic springs, *727.
Modernizing old trucks [Brown], *104; Comments on, 95.
Headlights used for park lighting, Toronto, 373.
Headlight, new type, for electric car roof, *457.
Headways (see Schedules):
Heavy Electric Traction (see also Locomotives, Electric):
—Austria extends electrification, Details, *958; Comments on, 999.
—Copper used in C.M.&St.P. electrification [Beeukes], 1042.
—Czechoslovakia electrification plans, 377.
—Effect of Diesel locomotive on [Cooke], 367; [Storer], 368.
—Electrification recommended as aid to farmers, 54.
—Great Northern Ry. electrification plans, 260.
—Illinois Central electrified service, *658, 860, 989.
—Italian engineers study American methods of electrification, 1130.
—Italy, Electrification progress, 909; 25 years operation; 1002; Comments on, 999.
—Java begins electric operation, Details [Balsem], *191, 609.
—Long Island R.R., Electrification plans, 1926-1929, 45.
—Pennsylvania R.R. to electrify Philadelphia section, 563.
—Progress in 1925, Statistics, 28.
—Russia to extend electrified lines, 618.
—Steam railroad electrification discussed, 296, 805.
—Uruguay, Electrification plans, 170.
—Vienna traffic doubles, 724.
Highwood, Ill.:
—Chicago, North Shore & Milwaukee R.R.:
Annual report, 820.
Awards made for station names, 167.
Commutation fares reduced, 901.
Employee insurance increased, 238.
Mortgage bonds sold, 1126.
New cars ready for delivery, 954.
New passenger stations for, 798.
Skokie Valley line, Construction, details, 985, *1043.
Zion bus ordinance over-ruled by Commission, 1029.
Historical:
—Bronze tablet commemorates Easton Ry., 1008.
—Davenport, Iowa, Growth, 734.
—Transit development in New York [Storrs], 644.
Holyoke, Mass.:
—Holyoke Street Ry.:
Bus competition upset plans, 1029.
Interstate bus competition restricted, 378.
Mount Tom property to be sold, 654.
Power situation adjusted, 419, 694.
—Railway-bus suit, Decision postponed, 946.
Hornell, N. Y.:
—Hornell Traction Co.:
Bus service to be substituted, 947.
Remodeled cars, Design [Bennett], *1098.
Service abandoned, 991.
Hose bridges for car tracks adopted, Pittsburgh, Pa., *765.
Houston, Tex.:
—Houston Electric Co.:
Bus operating contract with realtors, 1008.
Selling service, Methods [Dewhurst], *929.
Hudson & Manhattan R.R. (see New York City).
Huntington, W. Va.:
—Ohio Valley Electric Ry.:
Modernization program, Results, *1086.

I

Illinois Central R.R.:
—Electrification progress, *658, 989.
—Electrified service begun, 860.
Illinois Electric Railway Assn.:
—Annual meeting, Report, *552.
Illinois Power & Light Co. (see Chicago, Ill.).
Illinois, State of:
—Utility operations controlled by State Commission, 943.
Illinois Traction System (see Chicago, Ill.).
Indiana, Columbus & Eastern Traction Co. (see Springfield, O.).
Indianapolis, Ind.:
—Bus terminal history outlined, 566.
—Indianapolis & Cincinnati Traction Co.:
Protective committees appointed, 570.
—Indianapolis & Northwestern Traction Co.:
Protective committee formed, 1125.
—Indianapolis Street Ry.:
Annual report, 341, 1076.
Bonus as a reward for courtesy, 736.
Labor question in courts, 1123.
One hundred cars to be modernized, 606.
Transfer charge increased, 169.
Wage increase asked, 1027.
—Interstate Public Service Co.:
Annual report, 1031.
—Terre Haute, Indianapolis & Eastern Traction Co.:
Abandonment of bus line sought, 737.
Merger plans, 1031.
Power plant improvement plans, 574.
Safety zones costructed, Details [Walker], *319.
Signboard advertising [Walker], *195.
—Transportation coordination urged, 650.
—Violation of labor contracts before court, 773.
Indiana, State of:
—Accounting method for bus purchase specified, 86.
—Bus lines seek fare increases, 87.
—Bus merger plans, 650, 775.
—Bus routes sales to tractions approved, 420.
—Light, power and traction merger under way, 264.

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Inspection:
—Bus inspection, Akron, Ohio [See], *504.
—Car for track inspection, Roller bearing, *686.
—Trolley wire, night work, Ft. Worth, Texas, 79.
Insurance, Fire:
—Costs reduced, Chicago Surface Lines [Gordon], *708.
—Insurance labels for cars, 1049.
Insurance and Pensions:
—Employee insurance increased, Chicago, Ill., 238.
—Employees' Benefit Unit to carry own insurance, Kansas City, Mo., 772.
—Group insurance plan, Baltimore, Md., 609.
—Group insurance popular, Chicago, 438.
Interborough Rapid Transit Co. (see New York City).
International Railway Co. (see Buffalo, N. Y.).
Interstate Public Service Co. (see Indianapolis, Ind.).
Interstate Street Ry (see Attleboro, Mass.).
Interurban Railways:
—Expansion by bus co-ordination [Pinkley], 249; [Smith], 250; [Graham], 251.
—Features of interurban cars, A.E.R.A. report, *1086.
—Interurban rehabilitations [Gordon], 233.
Italy:
—Electrified operation, 25 years, *1002; Comments on, 999.

J

Jackson, Mich.:
—Michigan Electric Ry.:
Employees solicit freight, 918.
Wage arbitration, Bus operators, 902.
Jamaica Central Rys., Inc. (see New York City).
Jamestown, N. Y.:
—Bus lines to suspend, 47.
—Jamestown Street Ry.:
Personnel changes, 785.
Japan:
—Damages to railways by earthquakes, 40.
Java:
—Dutch East Indies States' Rys.:
Electrified service, Details [Balsem], *191.
Jitneys (see Motor buses).
Joliet, Ill.:
—Chicago & Joliet Ry.:
Safety drive, *1100.
Joplin & Pittsburg Ry. (see Pittsburg, Kans.).

K

Kansas City, Kans.:
—Franchise question up, 295.
Kansas City, Mo.:
—Interurban station ordinance rescinded, 339.
—Kansas City Public Service Co.:
Franchise negotiations, 944, 984.
—Kansas City Rys.:
Bus operations, Results, 818, 1074.
Bus wheel tests, 830.
Foreclosure sale, 48, 88, 948, 1076.
Franchise negotiations, 944, 984, 1024.
Paving question raised, 695.
Power contract, 1071.
Reorganization, 422, 740, 864, 1125.
Repaving controversy, 647.
Kentucky Association of Public Utilities:
—Midwinter meeting, Running report, 204.
Kentucky, State of:
—Bus regulations, 775.
—Gasoline tax increased, 378.
Kentucky Traction & Terminal Co. (see Lexington, Ky.).
Key System Transit Co. (see Oakland, Cal.).

L

Labor (see Employees).
Laconia, N. H.:
—Laconia Street Ry.:
Receivership terminated, 948.
Lake Shore Electric Ry. (see Cleveland, O.).
Lamps (see Lighting and lighting fixtures).
Lancaster, Pa.:
—Conestoga Traction Co.:
Property included in merger, 215.
Legal:
—Federal Court restrains 5-cent fare order, Chicago, 943.
—Holyoke, Mass., Railway-bus suit, 946.
—Labor contract violations before court, Indianapolis, Ind., 773.
—Legal notes, 89, 267, 467, 615, 783, 995.
—Rate decision, Madison, Wis., 172.
—Salaries of federal judges, Comments on, 179.
Legislation for Railways:
—Amendment to railroad law lost, 737.
—Enabling bill, New York, 860, 942.
—I.C.C. schedules hearings on transportation act, 986.
—Jersey paving bill laid over, 375.
—New Haven railway control bill opposed by Governor, 897.
—Paving bill lost, New York, 733.
—Paving relief bill defeated, New Jersey, 259, 565, 606.
—Permissive recapture bill, New York City, 461.
Legislation for railways (Cont.):
—Regulation brings stability [Nash], 965.
—Relief from unwise legislation necessary, 997.
—Tax value basis for rates, Bill proposed, 297.
—Thayer bill approved, New York, 900.
—Transit Commission changes, New York City, Details, 607.
—Utility operations controlled by State Commission, Illinois, 943.
Lehigh Traction Co. (see Hazelton, Pa.).
Lehigh Valley Traction Co. (see Allentown, Pa.).
Levis, Can.:
—Levis County Railway:
Dipping and baking armatures [Chenard], 1066.
Lexington, Ky.:
—Kentucky Traction & Terminal Co.:
Car slogans tell of service, *805.
Lighting and lighting fixtures:
—Floodlight for railway yards, 812.
—Grand Rapids Ry., new cars, *914.
—Headlight, New type, for electric car roof, *457
—Safety guard on lamp, *208.
—Temporary street lighting stands, N. Y. C., *934.
Lincoln, Neb.:
—Gas and electric properties combined, 568.
Little Rock, Ark.:
—Arkansas Central Power Co.:
Franchise amendment, 169.
Loading platforms (see also Terminals and waiting stations).
—Iron culvert installed at interurban stops, *163.
Locomotives:
—Articulated:
Piedmont & Northern Ry. builds, Details, *156.
—Austria uses three types on electrified lines, *958.
—Diesel-electric:
Discussed in joint New York meeting, 366.
Effect on electrification [Cooke], 367.
Features of [Storer], 368.
Use of [Katté], *366.
—Effect on railway location, A.R.E.A. report, 518.
—Freight locomotive for Silesian Mountain Ry., Details, *963.
—Japan manufactures, 347.
—Java, Electrified division [Balsem], *191.
—Montreal harbor order, 530.
—N. Y., N. H. & H. order, *1131.
—Oerlikon locomotive tested, Paris, 809.
—Oil-electric:
Chicago & Northwestern Ry. purchase, 869.
Long Island R.R., Design, *75.
—Oil-electric and gas-electric, Advantages analyzed [Candee], 290.
—Orders during 1925, Statistics, *19; Comments on, 3.
—Pennsylvania R.R. orders for electric passenger, 387.
—Switching, For New York Central, Specifications, *1081.
—Switzerland develops combination locomotive-car, *321.
—Three-phase, Italian electrified railways, Details, *1002; Comments on, 999.
London, Ont., Can.:
—London Street Ry.:
Cars resume operation, 168.
Fares increased pending new franchise, 84.
Long Island Electric Ry. (see New York City).
Long Island R.R. (see New York City).
Loop line suggested for New York-New Jersey commuters, 210.
Los Angeles, Cal.:
—Los Angeles Ry.:
Accidents reduced, 211, 976.
Bonus to trainmen, 127.
Cleaning dust from armatures, 849.
Dispute over use of tunnel, 692.
Promotion system, 402.
Tower truck, Four-section [Brittain], *256.
Welding wheel flanges [Brittain], *413.
Wood blocks for shop flooring, *207.
—Pacific Electric Ry.:
Accidents reduced, 976.
Annual report, 823.
Drainage at interurban car stops, *163.
Fare increase in Pasadena disallowed, 168.
Fares decreased, 694.
Sectionalizing switch for spur tracks [Appel], *329.
—Terminal hearing adjourned, 260.
Louisville, Ky.:
—Louisville & Interurban Ry.:
Commuters' rates increased, 420.
—Louisville Ry.:
Annual report, 423.
Christmas party, Details, 167.
Differential in fares sought, 295.
Fare increase, 209, 259, Bus, 737.
Franchise changes, Ads tell need of, 942, 986; Comments on, 956.
Franchise negotiations, 1072.
Newspaper ads tell need of railway expansion, 649.
Right-turn signals installed, *371.
Wage increase, 564.
—Merchants ask for jitney regulations, 565.
Lubrication:
—Bearing lubrication discussed by Metropolitan Section, A.E.R.A., 118.
Lubrication (Cont.):
—Bearings, Railway [Dean], 119; [Guynes], 121.
—Car and crankcase oil reclaimed, Washington, *1055.
—Greasing and testing trolleys, *727.
—Oil handling facilities, Boston, Mass., *1055.
—Turbine drive for boiler feed pump, 348.

M

Madison, Wis.:
—Madison Rys.:
Bus service, Growth of, 130.
Mail:
—Postal revenues paid railways, 243.
Maintenance practice (see also Repair shop practice and Car Cleaning):
—Better maintenance on new equipment, Comments on, 831.
—Bus and car maintenance, Co-ordination [See], *504.
—Car noises from poor maintenance [Williams], *476.
—Catalog numbers of bus parts, 270.
—Discussed by Illinois Electric Ry. Assn. *552.
—Engineering organization an aid to [Paterson], *497.
—Foundation for selling transportation, Comments on, 832.
—Good maintenance reduces costs [Clark], c512.
—Labor-saving equipment reduces costs, Comments on, 474.
—Maintenance costs, 1925, Atlanta, Ga., 588.
—Maintenance work affects industry prestige, Comments on, 661.
—Part in merchandising transportation, Comments on, 473.
—Pull-in record, 1925, New Orleans, La. [Dawkins], 451.
—Pull-ins compared, Southern properties, 163; 1921-1925, *408.
—Railway motor bearings [Dean], 119; [Guynes], 121.
Management:
—Budgetary control, Details [Patten], *1063.
—Byllesby issues new magazine on, 278.
—Departmental coordination, Comments on, 578.
—Departmental organization, Boston "L", *282.
—Engineers as future executives, 689; Comments on, 662.
—Good management prevents unwarranted destruction, Comments on, 956.
—Management contract criticized, Indiana, 521.
—Small railway unpopular in combined management [Snyder], 556.
—Training potential executives [Danforth], 200; Comments on, 181.
Manchester, N. H.:
—Manchester Street Ry.:
Employee safety record, *260.
Market conditions:
—Abuse of time selling plan in bus field dangerous, 952.
—Allis-Chalmers Mfg. Co. earnings, 703.
—American Car & Foundry production plans, 54, 426, 530.
—American Car earnings, 1130.
—Babbitt metal consumption, 307, 430.
—Balloon tires, Market increasing, 787.
—Brake shoe sales, 1925, 426.
—Brill merger, Car building and motor, 138, 221; Comments on 351.
—Brill sales in 1925, 307.
—Brown Boveri earnings 1925, 746.
—Bus exports, 1925, 1130.
—Business conditions improve over 1925, 744, 997.
—Business forecasts for 1926, 307.
—Car manufacturers should be more aggressive [Spurr], c289.
—Car purchasers reported, 139.
—Coal legislation, Obstacles, 701.
—Cars, Small roads may create market for [Smith], c195.
—Copper, Outlook for 1926, 177.
—Dodge merger reduces prices, 54.
—Electrical business in Germany, 787.
—Electric locomotive production increases, 619, 870.
—Electric railway industry outlook for 1926, 51.
—English Electric business, 908.
—Financial report, Westinghouse Air Brake Co., 619.
—Foreign trade, Attitude toward, 270.
—Gas-electric rail car sales, 1129.
—General Electric earnings decrease in 1925, 575.
—Graham Bros., motor sales, 1035.
—Haskelite business increases, 745.
—Haskelite marketing policy, 703.
—Japanese railway orders rails, 471.
—Mack sales to railways, 348, 1080.
—Manufacturing conditions, 1925, Review, Statistics, *52.
—Metal prices, Legislative safe-guards for stability sought, 138.
—Ohmer sales in January, 387.
—Oil production and prices predicted, 347.
—Organization formed to finance bus purchases, 829.
—Pneumatic door control equipment, Foreign field, 137.
—Railway motor exports, 703.
—Renewal parts manufacture by railways [Angerer], 92.

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Market conditions (Cont.):
—Rubber merger, 348.
—Rubber price situation, 219, 531.
—Steel industry, Condition of, 271.
—Storage battery business good, 786.
—Tool steel orders, 139.
—Transportation vehicles, Market for [Gordon], *349.
—Trolley wire output, 1925, 745.
—Westinghouse sales, 619, 744, 909, 1080.
—Yellow bus sales, 954, 1081.
—Yellow Coach capital stock increase, 1080.
—Yellow Coach earnings, 1036, 1131.
Market Street Ry. (See San Francisco, Cal.):
Massachusetts, State of:
—Bus competition rights to be defined by commission, 1029.
—Bus regulations and rules, 340, 990.
McGraw-Hill Co.:
—Keystone Company purchased, 93.
Memphis, Tenn.:
—Memphis Street Ry.:
Bonus earned by trainmen, 565.
Wage arbitration, 736, 1123.
Merchandising transportation (see also Publicity & Traffic stimulation.):
—A. E. R. A. Committee reports, 123, 1022, 1117.
—Atlanta, Ga., Selling rides, Comments on, 57.
—Better merchandising is bringing results [Gordon], *827.
—Campaign to increase traffic, Dallas, Tex., Details, *753.
—Car design affects [Williams], *669.
—Constructive merchandising, Comments on, 1085.
—High-pressure salesmanship needed, Comments on, 309.
—Industry needs merchandising viewpoint, 406; Comments on, 390.
—Methods of selling service in Texas cities [Dewhurst], *879, *929.
—Methods to follow, Comments on, 999.
—Modernization of cars affects, A.E.R.A. report, *1086; Comments on, 1083.
—Newspaper ads sell service, Baltimore, Md., *550.
—Part of maintenance men in, Comments on, 473.
—Selling service, Advantages of [Wolff], *761.
—Service messages on car cards, *398.
—Trolley maintenance as an aid to [Neild], *479.
Miami, Fla.:
—Miami Beach Ry.:
Cars ordered, Specifications, 54.
Features of new cars, *283.
Michigan City, Ind.:
—Chicago, Lake Shore & South Bend R.R.:
Switching arrangements with steam roads, 418.
—Chicago, South Shore & South Bend R.R.:
Indeterminate permit rights, 1072.
New cars ordered; Specifications, 348.
Rehabilitation work, 24.
Michigan Electric Rys. (see Jackson, Mich.):
Middlesex & Boston Street Ry. (see Newtonville, Mass.):
Milwaukee, Wis.:
—Milwaukee Electric Railway & Light Co.:
Advertising drive, 1118.
Annual report, 341.
Budget plan, 1926, 376.
Electric shop truck, Uses for [Payne], *109.
Freight line authorized, 461.
Headway recorders, Installation, Details, *279.
Interurban and bus developments [Pinkley], 249.
One-man car service, 295, 418, 897, 1068.
Passengers carried by, Per cent, 1015.
Personnel selection and training [Dewhurst], *624; Comments on, 622.
Preferred stock called for payment, 215.
Rapid transit line, Construction details, *679.
Safety demonstration to school children, 85.
Shop furnaces, Calorizer equipped, *207.
Temporary bridge construction, 40.
Testing and greasing trolleys, *727.
Traffic survey to be made, 167, 1119.
Wage agreement renewed, 168.
Waukesha franchise agreement, 338, 565.
—Three railways inter-connected, 419.
Minneapolis, Minn.:
—Minneapolis Street Ry.:
Financial report, 777.
Improvements, Expenditures planned, 308,
—Twin City Motorbus Co.:
Buses to be rerouted, 650, 818.
Bus taxes, 378.
Expansion plans, 299, 531.
Steam railroad competitive buses disallowed, 775.
—Twin City Rapid Transit Co.:
Annual report, 614.
Fares increase controversy settled, Details, 82.
Gas-electric bus tests, 1129.
Rehabilitation plans, 620.
Welfare fund paid to employees, 1122.
Minnesota, State of:
—State commission has right to fix fares, 128.
Mobile, Ala.:
—Mobile Light & Railroad Co.:
Controversy with auto dealers, 362.
Rail and pole storage, *514.
Removing paint by sand blast, *598.
Wheel hoist for raised pit, *455.
Montreal, Que., Can.:
—Locomotives for Harbor, 530.
—Montreal Tramways.:
Cars ordered, Specifications, 830, 870, 952.
Dipping and baking electrical equipment, Details [Scott], *675.
Morristown, N. J.:
—Morris County Traction Co.:
New cars increase traffic, Details, *763.
—Railway and bus compromise, 946.
Motor buses, Design:
—Bus engine piston, New type, *850.
—Buses will conserve rail investments, 894.
—Cincinnati, Ohio, Mack buses, *576.
—Detroit, Mich., Specifications, 471.
—Double-deck buses, Cleveland, *545.
—Gas-electric, Westinghouse-Fageol, Details, *257.
—Lang bodies, New features, *293.
—Progress in, Comments on, 55.
—Six-Wheel Co. equips buses with air brakes, 572.
—Tendencies discussed at Mack convention, 219.
—White chassis improvements, 271.
—White model bus chassis, Details, *643.
Motor buses, Field for:
—Complete service includes buses [Buffe], 717; Comments on 705.
—Co-ordination with rail lines [Ritchie], 201; Comments on, 181; [Wickwire], 203.
—Developments and future use for, 429; Comments on, 790.
—Electric railway replacements, Extent of, 242.
—Feeders to railways, Possibilities [Arnold], 557.
—Finding the field of the bus [Budd], 715; Comments on, 705.
—Interurban railway expansion by bus co-ordination [Pinkley], 249; [Smith], 250; [Graham], 251.
—Newspaper comments on, *434.
—Place for the bus, Comments on, 748.
—Place in transportation [Murphy], 198.
—Place in urban transportation [Locke], 1021.
—State commission cites its views, 263.
—University bus service, Baton Rouge, La.
—Using to relieve congestion [Miller], *813.
Motor Buses, Gasoline-electric:
—Advantages of electric drive for [Thirlwall], 452.
—Boston & Maine R.R., Design, 572.
—Mack single-motor bus, Design, *687.
—Meter measures performance, 457.
—Newark, N. J., order, Details, 51.
—Reading R.R., Operation by, 194.
—Westinghouse-Fageol bus, Design, *257
Motor buses, Installation:
—Bloomsburg, Pa., 610.
—Brownsville, Texas, 524.
—Buffalo, N. Y., 737.
—Cincinnati Street Ry., 650.
—Columbia, S. C., 44.
—Englewood and Littleton, Colo., 776.
—Gulfport, Miss., 87.
—Hornell, N. Y., 991.
—Houston, Tex., 1008.
—Manitowoc, Wisc., Trial service, 862.
—Ogden and Preston, Utah, 1029.
—Napa, Cal., 47.
—Newton, Mass., 47.
—New York, New Haven & Hartford R.R., 862; Comments on, 832.
—North Jersey, De luxe bus service for, 263.
—Ottawa, Ont., Sightseeing, 862.
—Phenix City, Ala., 991.
—Quincy, Ill., 262.
—Railway orders during 1925, Statistics, *29; Comments on, 2.
—Trenton & Mercer County Traction Corp., Details, *67.
—Walla Walla, Wash., 171.
—Westfield, Mass., 902.
—Youngstown Municipal Ry., 130.
Motor buses, Jitney competition:
—Oklahoma City, Okla., 261, 610.
—Savannah, Ga., Service suspended, 83.
Motor buses, Practice with:
—Battery charger used for economy, *1017.
—Brakes for buses and trucks, 814.
—Bus maintenance, *494.
—Bus merger plans, Indiana, 775.
—Cincinnati, Ohio, Co-ordinated service, *107.
—Cleveland coordinates trolley and bus, Details, *545.
—Co-ordinating bus and car maintenance reduces waste, Comments on, 474.
—Co-ordinating with existing transit facilities [Horton], *601.
—Development of auxiliary bus service, Boston "L", [Dana], *757; Comments on, 747.
—Flexibility of, Comments on, 1084.
—Gage for alignment of wheels, [Foote], *890.
—Indiana bus failure, [Storrs], 226; Comments on, 225.
—Jamestown, N. Y., Bus lines suspended, 47.
—Maintenance, Akron, Ohio [See], *504.
—Maintenance discussed by C. E. R. M. M.'s A., *331.
—Maintenance practice, Chicago [Wooton], 333.
—Middlesex & Boston Street Ry., Details, *801.
—New Bedford, Mass., Spare tires carried on rear bumper, *969.
—New Haven bus operation, Extent of, 298.
—N. Y. C., railway-bus company bid for bus franchise, 374.
—N. Y., N. H. & H. R.R., Coordination plans, 170; Comments on, 141.
—Operation by electric railways, Statistics, 1925, *29; Comments on, 2.
—Operation in eight states, Statistics, 288.
—Sand spreader for slippery pavements, *591.
—Specifications, Too many laws about, [Scragg], 618; Comments on, 578.
—Toronto, Ont., Sightseeing and feeder routes, 284.
—Trenton, N. J., Operating methods, Details, *67.
Motor buses, Practice with (Cont.):
—Washers for springs made from old tires [Foote], *599.
—Washington, D. C., De luxe service, Details, *276; Comments on, 275.
—Water rheostat test for gas-electric buses, *766.
Motor buses, Regulation:
—Arkansas Railroad Commission to regulate, 420.
—Beech Grove, Ind., Controversy, 87, 695.
—Bill to regulate interstate buses in New York-New Jersey tunnel, 863.
—British Columbia, Can., New regulations, 695.
—California registration law unconstitutional, 1029.
—Colorado buses controlled by Commission, 776.
—Commission control in New Jersey, 650; Comments on, 623.
—Failure of New York-New Jersey buses shows need of regulation, Comments on, 913.
—I.C.C. to investigate bus competition, 946, 1074.
—Indiana city lines under Commission rule, 299, 462.
—Interstate bridge and tunnel bus traffic, Bill proposed, 650.
—Interstate bus control, Progress, Comments on, 142; 180.
—Interstate bus regulation desirable [Ritchie], 877.
—Interstate regulation bill, 524, 567; Details, 610.
—Kentucky buses under new rule, 775.
—London, England, Bus service reduced to relieve congestion, *635; Comments on, 623.
—Massachusetts, New law, 340, 990.
—Minnesota regulations, 1124.
—Missouri commission cannot rule on fares, 298.
—New Jersey, Amendment proposed, Details, 130.
—New York Governor hears opposition to bus bills, 857.
—Over-regulation to be guarded against, [Scragg], 618; Comments on, 578.
—Regulation bring stability [Nash], 965.
—Rhode Island, Suspension of buses not bonded, 1124.
—State regulatory powers, Comments on, 142.
—Trends in motor vehicle regulation, 854.
—Utah buses regulated by Utilities Commission, 1024.
—Zion, Ill., Restrictions not illegal [Huenery-ager], c1113; Comments on, 1029.
Motors, Electric:
—Automatic starter for synchronus motors, *978.
—Axle dustguards for, *726.
—Back gearing for shop motors, 1018.
—Brake rods, Arch support prevents chafing, *414.
British tramways, Improvements in, *1109.
—Denver, Colo., Improvements in, 164.
—Drive developments, Germany, *1053.
—Gear case with overlapping joint, 415.
—Keeping end play to a minimum, *164.
—Measuring and compensating armature end play [Zimmerman], *839.
—Pinion puller, Jack principle, *1061.
—Rewinding armatures for [Zimmerman], *315; Comments on, 310.
Municipal Operation: (see also Government ownership):
—Seattle, Wash., proposal, 44, 606.
Municipal Railway of San Francisco (see San Francisco, Cal.):
Muskegon, Iowa:
—Muskegon Traction & Lighting Co.:
Advertising car tells of service [Blue], *549.

N

Nashville, Tenn.:
—Nashville Interurban Ry.:
Management changed, 821.
Personnel changes, 825.
—Nashville Railway & Light Co.:
Accidents reduced, 128.
Conference to relieve traffic congestion, 210.
National Conference on Street and Highway Safety:
—Second meeting, Report, 602.
Nebraska, State of:
—Bus franchise decision, Comments on, 955.
Nelsonville, Ohio:
—Nelsonville-Athens Electric Ry.:
Operations begun, 338.
Newark, N. J.:
—Public Service Corporation of New Jersey:
Annual report, 525; 822, 1126, Comments on, 535.
Customer-ownership campaign planned, 569.
—Public Service Ry.:
Accident faker convicted, 418.
Alcohol vapor prevents air pipes freezing, *560.
Armature storage, *515.
Continuation transfers in Irvington, Discussion, 337.
Fare boxes ordered, 271.
Mud guard protects resistors, *686.
One-man car operation upheld, 735.
Spreader on bolster saves motor leads, *641.
Wage issue being discussed, 986.
—Public Service Transportation Co.:
Arrow Bus Co. purchased, 737.
Bus substitution on Bergen line, 862.
De luxe service installed, 695.
Gas-electric cars ordered, Details, 51, 829.
Sand spreader for slippery pavements, *591.
—Terminal and transportation plan for, 166.

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Newark, N. J. (Cont.):
—Traffic signals, Effect on railway operation [Miller], *580.
—Transit Commission recommended, 262.
New Bedford, Mass.:
—New Bedford & Onset Street Ry.:
Discontinuance suggested by management, 614.
—Union Street Ry.:
Anchor plate for trolley wire, *328.
Brake adjustment, *372.
Insulator for trolley wire, *372.
Journal box covers clamped on, 293.
Journal box shims save wear, *372.
Personnel changes, 616.
Spare bus tires carried on rear bumper, *969.
Thermit welds used in rapid track construction, *678.
New Brighton, Pa.:
—Beaver Valley Traction Co.:
Annual report, *740.
Armature failures eliminated by baking, *934.
Battery charger used for economy, *1017.
Car cards improve public relations, *714.
Christmas party, 127.
Modernization program, Results, *1086.
Paving relief voted, Monaca, 774.
Pictures painted on car depicts service, *1007.
Service maintained during bridge reconstruction, *592.
Newburgh, N. Y.:
—Newburgh Public Service Corp.:
Bus operation expanded, 650.
New England Street Railway Club.:
—Annual banquet, Report, 558.
—Purchasing and stores department economies discussed, 854.
—Trolley discussed as transportation agency, 411.
New Haven, Conn.:
—Connecticut Co.:
Arbitration award, Details, 44.
Personnel changes, 175.
Pole racks rebuilt, Berlin substation, *111.
Wages increased, 608, 944.
New Jersey, State of:
—Buses under commission control, 650; Comments on, 623.
—Bus regulation amendment proposed, 130.
—Construction budget, Utility companies, 290.
—Drawbridge rush hour closing asked, 563.
—Interstate bus service curtailed, 378.
—Paving bill defeated, 606.
—Paving relief voted, 565.
New Orleans, La.:
—New Orleans Public Service, Inc.:
Accident reduction contest, 736.
Engineering department organization, Details [Paterson], *497.
Preferred stock sold to customers, 570.
Pull-in record, 1925 [Dawkins], 451.
Spray painting bottom of cars, 599.
Track construction and maintenance, equipment, Details, *664.
Track gage changed over-night, Details [Meyers], *585.
Transportation practice, Details, *631.
Wide gaging wheels, 685.
Newport News & Hampton Railway, Gas & Electric Co. (see Hampton, Va.).
Newtonville, Mass.:
—Middlesex & Boston Street Ry.:
Buses replace cars in Newton, 47.
Bus service expanded, Results, Details, *801.
New York Central R.R.:
—Money advanced to traction lines, 948.
—Switching electric locomotives, Specifications, *1080.
New York City:
—Abandonment of municipal subway operation urged, 608.
—Bill proposed for subway construction, 339, 564.
—Brooklyn City Railroad:
Bus applications, Brooklyn, 566.
Personnel appointments, 176.
—Brooklyn-Manhattan Transit Corporation:
Accident casualty insurance renewed, 447.
Accident prevention bureau organized, 860.
Armature bearings, Boring methods, *641.
Articulated cars ordered, 430.
Bus applications, Brooklyn, 566.
Financial condition, Comments on, 96.
New cars, Date set for bids, 178.
Personnel changes, 176.
Quarterly dividend declared, 525.
—Bus proposals, 298, 340, 416, 462, 566, 1120; Comments on 534, 1075.
—Bus report on franchise question, 298, 566.
—Bus situation explained [Storrs], 554, 1071.
—Car equipment ordered in 1925, 177.
—Crossing signal installation rules, 668.
—Dry Dock, East Broadway & Battery R.R.:
Interest payment, 131.
—Eighth Avenue R.R.:
Device for forming loops on rods, *643.
Fare boxes, Repair practice, *326.
Fixture for bending rings, *371.
Handle fits for door and step operation, *413.
Scraper car for removing snow, *559.
Street lighting stands, Temporary, *934.
Tools for forming step-adjuster bolts, *514.
—Fare situation, Comments on, 534.
New York City (Cont.):
—Fifth Avenue Coach Co.:
Contract to buy New York Rys., 938; Comments on, 912.
—Fifth Ave. Coach Co.—New York Rys. Merger, 374, *434, [Jackson], c597; Comments on, 389.
—Interborough Rapid Transit Co.:
Financial reports, 49, 215.
Improvements ordered by Transit Commission, 772.
Power distribution, Details, *152.
—Jamaica Central Rys., Inc.:
Financing plans, 1078.
New company resumes service on abandoned Long Island lines, 606.
—Long Island Electric R.R.:
Foreclosure, 423.
—Long Island R.R.:
Annual report, 822.
Continuance of Rockaway service requested, 649.
Electrification plans, 1926-1929, 45.
Oil-electric locomotive, Design, *75.
—Loop line suggested for New Jersey commuters, 210, [Miller], *444.
—Merchants offer aid in transit problem, 744.
—Municipal trolley operation, Comments, on, 533.
—New Rochelle-N. Y. sightseeing services restrained, 695.
—New York & Harlem R.R.:
Madison Ave. surface line sold, 821.
Proxies asked for meeting, 864.
—New York & Long Island Traction Co.:
Bus franchises asked to replace trolleys, 524.
Physical assets for sale, 867.
Foreclosure, 343, 423.
Service suspended, 653.
—New York & Queens County, Ry.:
Ferry car solves high water problems, Design, *189.
First mortgage issue liquidated, 381.
—New York Railways:
Bus plan proposed, 374.
Fifth Ave. Coach Co. plans to buy, 938; Comments on, 912.
Traffic signals decrease speed [Miller], *580.
—New York Rapid Transit Corp.:
Washing the Brooklyn tunnels, 1099.
Spray painted signs, Details, *1114.
Third rail insulator maintenance [McKelway], *113.
—New York, Westchester & Boston Ry.:
Bus proposal favored, Details, 737.
New cars ordered, 1130.
Westchester rapid transit report submitted, 773.
—Option on surface lines held by Craig, 523.
—Queensboro subway extension opened, 563.
—Republic Railway & Light Co.:
Dividend payment, 613.
—Richmond Light & Railroad Co.:
Cane seats, Machine for cleaning, *81.
—Staggered hours proposed, Comments on, 353.
—Staten Island Midland Ry.:
Annual report, 48.
Patrons ask continuance of service, 773.
Trackless trolley operating report, 1921-1925, 521; Comments on, 533.
—Staten Island Rapid Transit Co.:
Passenger trains operated by electricity, 46.
—Subway construction, Progress, 647, 858.
—Surface car operation, A. E. R. A. statement, 522.
—Synchronized signals to be interlocked, Comments on, 873.
—Third Avenue Ry.:
Mt. Vernon-New York sightseeing buses opposed, 650.
Semi-annual dividend declared, 525.
Speed test, cars and buses, 67; [Transportation, c195.
Training for platform men, Details [Segard], *1105.
—Ticket sales show greatest traffic points, 320.
—Track removal bill approved, 897.
—Traction revenues, Report, 127.
—Traffic committee report on congestion, 985.
—Transit Commission changes, Details, 607, 816.
—Transit debt bill favored by Senate, 419.
—Transit development, History [Storrs], 644.
—Transit situation, 168, 458; Comments on, 180, 872.
—Westchester Electric R.R.:
Partial bus substitution proposed, 903.
Sightseeing bus competition denied, 946.
New York Electric Railway Association.:
—Midwinter meeting:
Papers, 197; Comments on, 181.
Running report, 196.
New York, New Haven & Hartford R.R.,
—Annual report, 865.
—Boston-Providence bus route allowed, 819.
—Bus co-ordination plans, 170; Comments on, 141.
—Bus operation, Extent of 298.
—Bus service not competing with electric railway allowed, 862; Comments on, 832.
—Electric locomotives ordered, *1131.
—Electric railway control bill opposed by Governor, 897.
—Equipment on order, 178.
—Worcester and Springfield bill favored, 734.
New York Railroad Club.:
—Electric drive and tires discussed, 730.
New York, State of:
—Bus bills, Progress, 611, 776, 857.
—Electrification in New York City, Time extended, 901.
—Enabling bill becmoes a law, 860, 942.
—Public Commission wants more authority over buses, 421.
—Thayer bill approved, 900.
New York State Rys. (see Rochester, N. Y.).
Noise reduction.:
—Air compressor noises reduced, *848.
—A. E. R. A. committee accomplishments [Williams,] c194; [Rasmussen], c324.
—Asset to public relations, Comments on, 535.
—Car noises from poor maintenance [Williams], *476.
—Electrical department can help in [McKelway], *481.
—Flexible trolley base suspension reduces noise, *977.
—Floor coverings an aid to, Comments on, 309.
—Gears, Tests for, Details [Sawtelle], *184.
—Indication of inefficiency, Comments on, 661.
—Influence on design [Gordon], 233.
—Merchandising value of [Williams], *669.
—Overhead construction maintenance affects [Neild], *479.
—Service improved by [See], c289.
—Trackwork, Effect on [Bean], 503.
—Track crossings reduce noise, Cleveland, *511; Comments on, 475.
Northern Ohio Traction & Light Co. (see Akron, Ohio).
Northern Texas Traction Co. (See Fort Worth, Tex.).
North Jersey Transit Commission:
—Interstate loop plan, 210; Analysis [Miller], *444; Comments [Mantell], [Saunders], c149; [Brinckerhoff], [Garber], c450; [Lewis], c639.
—Rapid transit plan proposed, *239.

O

Oakland, Cal.:
—Advertisements on street car exteriors, Controversy, 734, 860.
—Key System Transit Co.:
Annual report, 993.
Equipment trust issue, 696, 866.
Express car and local bus service application, 858.
Fare increase, Temporary, 126.
Ferry transport problem, 45.
Track extensions planned, 1023.
Transportation problem, 693.
Trustee appointed to operate, 905.
Ohio Brass Co., holds annual sales meeting, 137.
Ohio, State of:
—Blanket bus franchise denied by Supreme Court, 1074.
—Proposed expenditures in 1926, 306.
Oklahoma City, Okla.:
—Oklahoma Ry.:
Annual report, 172.
Bus operation, Success of, 47.
Jitney competition, 261, 610.
Ohio Traction Co. (See Cincinnati, O.).
Oil City, Pa.:
—Citizens' Traction Co.:
Transportation service during flood, *1013.
Omaha, Neb.:
—Omaha & Council Bluffs Street Ry.:
Franchise negotiations, 419, 735, 899.
Omnibuses (see Motor buses).
One man cars (see Cars, One-man).
Ontario, Canada:
—Franchise negotiations, Hamilton, London and St. Thomas, 732.
—Suspensions of railway service, Comments on, 56.
Operating Records and Costs:
—Attleboro, Mass., Seven months record, *719; Comments on 707.
—Augusta, Ga., Car modernization reduces, *932.
—Chicago Surface Lines, General review of [Gordon], *708.
—Comparison of operating expenses, 11 Railways, A.E.R.A. report, *1086.
—Construction costs index, 1925 [Richey], *37; Comments on, 2.
—Maintenance cost records, Comments on, 663.
—Modern cars reduce operating expense, Atlanta, Ga., Details, *874.
—Reports, Monthly and annual (see Statistics).
—Traffic handling cost, Berlin, Germany, 1011; Coments on, 1000.
Oshkosh, Wis.:
—Wisconsin Power & Light Co.:
Track reconstruction, Details [Oldfield], *102.
Ottawa, Ontario, Can.:
—Ottawa Electric Ry.:
Annual report, 992.
Sightseeing bus service installed, 862.
Wage agreement renewed, 1123.

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Overhead Contact System:
—Armored cap and cone insulator, 600.
—Austria electrified lines, Details, *958.
—Catenary construction:
Java electrified line [Balsem], *191.
—Condulet for ground wire, *516.
Skokie Valley line, Highwood, Ill., *1043.
—Construction and maintenance practice, Atlanta, Ga., *672.
—Design of overhead construction, St. Catharines, Can., Details [Villiers], *759.
—Efficient maintenance affects riding [Neild], *479.
—El Paso, Texas, Trolley wire maintenance, 116.
—Line maintenance to prevent delays, *492.
—Maintenance reduced, Ft. Worth, Tex., *1048.
—Pantograph air-break switch, *1018.
—Sockets or sleeves for cables, 114.
—Trolley wire breaks reduced in Boston, Details, *837.
—Trolley wire inspection, Ft. Worth, Texas, 79.

P

Pacific Electric Ry. (see Los Angels, Cal.).
Painting (including paint shop practice and equipment):
—Aluminum graphite paint, Composition of, 165.
—Car sign painting methods, Detroit, *455.
—Chemical mixture removes [Brown], *292.
—Denver, Colo., cars to be painted solid colors, 110.
—Destination signs painted with roller and mask, 849.
—Effect on public relations, Comments on, 473.
—Lacquer, Discussed by C.E.R.M.M.'s A., *331.
—Lacquer painting reduces drying time [Spratt], 332
—Paint brushes stored in steel cabinet, *977.
—Present-day methods for cars [Demarest], 198.
—Press for silk-screen sign painting, *1016.
—Sand blasting removes paint, Mobile, Ala., *598.
—Spray:
Bottom of cars spray painted, New Orleans, La., 599.
Chicago, Methods [Wheeler], *206.
Rolling steps for, Akron, Ohio, *560.
Sign painting, New York City, *1114.
—Repaving controversy, Leavenworth, Kansas, 647.
—Streamline effect on car bodies, Comments on, 96.
—Turntable speeds sash painting, *935.
Parking automobiles (see Automobiles).
Pavements:
—Brick, Life of, 140.
—Concrete breakers, Improved type, *258.
—Jersey paving bill laid over, 375.
—Paving dispute in Ohio Cities, 1120.
—Paving obligations, Morristown, N. J., *763.
—Paving relief granted:
Ecrose, Mich., 815.
Monaca, Pa., 774.
Progress [Nash], 965.
Pennsylvania-Ohio Electric Co. (see Youngstown, Ohio).
Pennsylvania Railroad:
—Baggage cars constructed by St. Louis Car Co., *572.
—Bridge construction, Beaver Valley, Pa., *592.
—Electric passenger locomotives ordered, 387.
—Philadelphia section to be electrified, 563.
Pennsylvania Street Railway Association:
—Annual convention, Report, 517.
Pensions (see Insurance and pensions).
Philadelphia, Pa.:
—Conowingo hydro-electric project approved, 417.
—Frankfort, Tacony & Holmesburg Street Ry.:
Injunction against sale of road, 174.
Operating plans by P.R.T., 85.
—Philadelphia Rapid Transit Co.:
Airplane service, Washington-Philadelphia, 1070.
Annual report, 949.
Automobile towing service installed, 1026.
Comments on, 1085.
Buses ordered, 271.
Bus service to waterfront, 170.
Capital stock increased, 172.
Cars ordered, Specifications, 308, *952.
Co-ordinating bus with existing facilities, Details [Horton], 601.
Delaware Bridge bus service proposal, 989.
Equipment trust certificates offered, 343.
Fare controversy, 126, 338.
Fare increase, Report of commission, Details [Dewhurst], 157; Comments on, 141.
Frankford line development plans, 85.
Gas-electric equipment, Operating details [Horton], 601.
Mortgage bonds offered to patrons, 820.
Parking plan beneficial, 461.
Parking plan extended, *722.
Personnel changes, *616.
Prize for company publication cover design, 608, *859.
Philadelphia, Pa. (Cont.):
Radio programs broadcasted, 45.
Selection and training methods for employees, Details, *971.
Sesqui-Centennial sight-seeing bus tours, 862.
Stock offered to customers and employees, 173; Results, *437.
Subway operation discussed, 168, 608.
Taxi operation proposed, 49, 260, 734, 816; Comments on, 97.
Transportation provided for Sesqui-Centennial, 128, 735; Details [Thayer], *919.
Wage reduction, 416; Comments on, 391.
Water rheostat test for gas-electric buses, *766.
—Subway may be municipally operated, 462.
Phoenix, Ariz.:
—Phoenix Railway Company of Arizona:
Dissolution decree granted, 131.
Rehabilitation plans, 697.
Situation outlined, 417.
Traffic survey, Comments on, 432.
Photography an aid to railways, Survey, *65.
Psychological tests for employees:
—Milwaukee, 624.
—Philadelphia, *971.
Piedmont & Northern R.R. (see Charlotte, N.C.).
Pittsburgh, Pa.:
—Pittsburgh Railways:
Annual reports, 343, 697.
Hose bridges for car tracks, Pittsburgh, Pa., *765.
Modern cars, Comments on, 578.
Modernization program, Details, *1086.
Parking restrictions speed up cars, 362; Comments on, 351.
Refund made by receivers, 88.
Service suggestions by patrons, 443, 565.
Suggestion department, 843; Comments on, 833.
Wage agreement renewed, 735.
—Stagger system suggested for traffic relief, 1122.
—Subway plans progress, 46, 771.
—Traffic survey, Boy Scouts aid, *918.
—West Penn Railways:
Fare reduction increases revenue [Horton], 243.
Pinion keys made permanent with shaft, *1116.
Pittsburg, Kans.:
—Joplin & Pittsburg Ry.:
Fares increased, 46, 169.
Reorganization plans, 738.
Poles (see also Overhead contact systems and Wood Preservation):
—Concrete bases installed under old poles, *111.
Portland, Me.:
—Cumberland County Power & Light Co.:
Ticket collecting method changed, 694.
Portland, Ore.:
—Portland Electric Power Co.:
Block signal performances, Report [Charters], *559.
Connecting rod reduces track switch failures [Charters], *598.
Pension plan under consideration, 338.
Portsmouth, Ohio:
—Portsmouth Public Service Co.:
New cars ordered, Specifications, *426.
Operating deficits, 381.
Poughkeepsie, N. Y.:
—Poughkeepsie & Wappinger Falls Electric Ry.:
Time tables distributed by trainmen, *640.
Power conservation:
—Energy saving campaign, Seattle, Wash., Details [Goodwin], *799.
Power distribution:
—Austria electrified lines, Details, *958.
—Direct current relays for feeder circuits, 1061.
—Electrical system overhauled, Chicago Aurora & Elgin R.R., Details, *593.
—Great Britain plans national power supply, 377.
—Holyoke, Mass., Situation adjusted, 694.
—Interborough, New York City, Details, *152.
—Mercury arc power rectified for current conversion, *728.
—Kansas City, Mo., New power contract, 1071.
—Skokie Valley line, Highwood, Ill., *1043.
—Surplus power agreement, Providence, R. I., 606.
—Welded steel tank for transformer, *979.
Power generation:
—Cleveland, Ohio, on all-substation basis [Bale], 714.
—Cost reduced, Chicago, Aurora & Elgin R.R., *593.
—Emergency equipment during flood, Oil City, Pa., *1013.
Power stations and equipment:
—London Underground extends service, 609.
Power transmission (see Power distribution).
Prescott, Dick, *115, *328, *513, *683, *847, *1057.
Providence, R. I.:
—United Electric Rys.:
Accidents reduced in 1925, 976.
Billboard campaign, *693.
Cars ordered, Specifications, *471.
Cars repainted, 649.
Entrance signs, Changeable, *371.
Modernization program, Results, *1086.
New wage and working agreement submitted, 988.
Power agreement, 606.
Surplus power, Market sought for, 339.
Publicity (see also Merchandising transportation):
—Booklet describes modernization work, Atlanta, Ga., 630.
—Car cards improve public relations, Beaver Valley, Pa., *714.
—Car slogans used, Lexington, Ky., *805.
—Illuminated signs on cars, Houston, Tex. [Bennett], *1098.
—Newspapers praise Chicago service, *648.
—Parade of new cars, Grand Rapids, Mich., Comments on, 1039.
—Photography as an aid to, *65.
—Pictures painted on car depict service, *1007.
—Posters used, Bridgeton, N. J., *144.
—Tokens sold in Christmas "lucky bags," 210.
—Utility news published in booklet form, Tennessee, 564.
Public Relations with:
—Annual reports as public relations material, Comments on, 789.
—Awards made for station names, North Shore Line, 167.
—Bad crossings, Effect on, Comments on, 622.
—Bridgeton, N. J., Promotion of, Methods, *144.
—Business men will help preserve Indiana line, 461.
—Bus service for crippled children, Toronto, Can., *775.
—Changing public attitude to bring relief from unjust burdens, Comments on, 431.
—Chicago Surface Lines, Methods of improving, Details [Gordon], *708.
—Christmas party, New Brighton, Pa., 127.
—Courtesy affects, Comments on, 791.
—Customer and employee ownership, Comments on, 431.
—Customer-ownership campaign, Vancouver, B.C., 465, 612.
—Customer satisfaction, Comments on, 180.
—Employee enthusiasm improves [Storrs], 554.
—Grand Rapids enlists support of Boy Scouts, *584.
—Hotel furnishes guests with trolley schedules, 765.
—Lost and found department may promote good will, Comments on, 873.
—Jacksonville, Fla., Merchant rents trolley for day, 1122.
—Noise elimination an asset to, Comments on, 535.
—Painting affects, Comments on, 473.
—Preferred stock sold to customers, New Orleans, La., 570.
—Public good will necessary to railways [Wolff], *761.
—Public utility prize awarded, 945.
—Service improvements suggested by patrons, Pittsburgh, Pa., 443.
—School children entertained, Rochester, N. Y., 1121.
—Texas properties promote good will, Methods [Dewhurst], *879, *929.
—Unsatisfactory relations reason for refusal of rate increase, Comments on, 955.
—Winning public good will [De Lamarter], 247; Comments on, 275.
—Washington, D. C., De luxe coach service improves, *276; Comments on, 275.
Public Service Corporation of New Jersey (see Newark, N. J.).
Public Service Ry. (see Newark, N. J.).
Public Utility Bureau formed, New York, 858.
Pueblo, Colo.:
—Southern Colorado Power Co.:
Cars remodeled for one-man operation, *970.
Puget Sound Power & Light Co. (see Seattle, Wash.).

Q

Quincy, Ill.:
—Quincy & Northeastern Ry.:
Bus certificate granted, 262.
Construction of new railway planned, 606.

R

Radio:
—All-copper rail bond, *1116.
—P.R.T. radio programs broadcasted, 45.
Rail joints and bonds:
—Bonding by zinc coating, Germany, *1060.
—Bond maintenance, Details [Lovell], *312.
—Bond tester, New Type, *81.
—Copper arc weld bond, *600.
—Track rail and third rail bonding, A.R.E.A. report, 519.
Railways:
—Automobile competition, Comments on, 142.
—Better merchandising bringing results [Gordon], *827.
—Buses and trucks will increase business [Vauclain], 1062; Comments on, 1039.
—Bus operation by, 1925, statistics, *29; Comments on, 2.
—Estimate of industry budget, 1925, *5; Comments on, 4.
—Extent of the industry, Statistics, 64.

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Railways (Cont.):
—Faith in railway industry, Comments on, 955.
—Financial outlook, 1925 reviewed, *13; Comments on, 4.
—Future opportunity for [Storrs], 554.
—Future of railway predicted [Loree], 732, c808; [Shapleigh], c808; [Richardson], [Buffe], [Beeler], c809.
—Industry advancements and future [Gordon], *385, 427, *573.
—Modernization benefits small properties, Comments on, 431.
—New local transportation era [Nash], 965; Comments on, 999.
—Operating statistics, 10 years [Richey], 281.
—Progress during 5 years [Budd], 229; [Coates], 245.
—Progress of the industry outlined by L. S. Storrs, 83.
—Quantity buying for small railways [Fuller], 893.
—Railway operation, A.E.R.A. report 651, 777.
—Review of events 1925 [MacMurray], *5; Comments on, 4.
—Rules for railways [Storrs], 226; Comments on, 225, 273, 577.
—Traction progress in 1925, 177.
—Traffic report, A.E.R.A., 131, 264, 424, 821.
—Trend of [Snyder], 556.
—Year's progress, Comments on, 1.
Rapid transit:
—Boston, Mass., Recommendations made to legislature, 82.
—Cleveland, Subway ordinance proposed, 44.
—Lisbon, Portugal, subway plans approved, 377.
—Milwaukee, Wis., Construction details, *679.
—Monorail elevated proposed for Detroit, 336.
—North Jersey, Plan proposed for, Details, *239.
—Oslo, Norway, to construct subway, 170.
—Pittsburgh, Pa., subway planned, 771.
—Queensboro subway extension opened, N.Y.C., 563.
—Transit work in Cincinnati, Progress, 647
Reading Railroad:
—Bus application, 524, 517, 611; Comments on, 535
—Gas-electric car operated, Details, 194.
Real estate development along Chicago, Aurora & Elgin R.R., *357.
Receiverships (see Financial).
Repair shop practice, Cars and car equipment:
—Alcohol vapor prevents air pipes freezing, *560.
—Armatures:
Cleaning dust from, 849.
Failures eliminated by baking, *934.
Measuring and conmpensating end play [Zimmerman], *839.
Rewinding, Details [Zimmerman], *315; Comments on, 310.
Testing, Chicago, Details [Wheeler], *834.
Testing block for, *1060.
Winding wires, Tension kept on, *164.
—Bearing fits, Comments on, 831.
—Bolster guides improve car riding, *890.
—Brake tie rods, *514.
—Cleaning and blowing out controllers, *848.
—Commutator slotter, Home-made, Atlanta, Ga., *766.
—Co-ordinating bus and car maintenance reduces waste, Comments on, 474.
—Corrosion eliminated on air reservoir bands, Detroit, *643.
—Cutting worn-out tires from wheels, *811.
—Dipping and baking electrical equipment, Montreal, Can., Details [Scott], *675.
—Disk grinding motormen's valves, 850.
—Double rod reduces brake release failures, *456.
—Forming step-adjuster bolts, *514.
—Hose for burning paint off cars, *727.
—Inadequate maintenance causes car noises [Williams], *476.
—Journal covers clamped in position, *293.
—Maintenance of old cars, Comments on, 474.
—Motor cleats prevent short circuits, *849.
—Motormen's seat, Adjustable, Erie, Pa., *811.
—Mud guard protects resistors, *686.
—Names substituted for numbers increases repair problem, Comments on, 310.
—Noise tells need of repairs, Comments on, 1037.
—Overhauling controllers [Bristol], 411.
—Rolling stock improvements, Richmond, Va., *500.
—Rolling stock maintenance [McMahon], *483.
—Semi-elliptic springs, Installing and removing, *727.
—Shims save wear on Journals, *372.
—Spreader on bolster saves motor leads, *641.
Repair shop practice (Cont.):
—Truck overhauling, Drill for, *891.
—Welded-in bushings for hangers, *686.
—Chicago, Overhauling for holiday service, Details [Adams], *188.
Repair shop practice, Shops and shop equipment:
—Air-operated clamp for drill press, *810.
—Armatures:
Adjustable carriers for, *515.
Assembly presents end play, *1116.
Baking, Details, Chicago [Jorgensen], *501.
Boring practice, B.-M.T., *641.
Dipping and baking, Levis, Can. [Chenard], *1066.
Hose used as buffer in dipping tank, 978.
Pinion keys made permanent with shaft, *1116.
Right materials essential, Comments on, 310.
—Board shows location of cars in shops, *849.
—Car wheel boring tool, Details, *330.
—Current control devices for installation of resistors, *850.
—Device for forming loops on rods, *643.
—Electrode, Water-cooled, *561.
—Fixture for bending rings, *371.
—Gas furnaces for soft metal melting, *1016.
—Insulator prevents wear on trolley wire ends, *373.
—Jack, self-lowering, *415.
—Malleable iron galvanized, 294.
—Manufacturing operations, Comments on, 475.
—Materials handling a factor in safety, 177.
—Metal-working machines, Combination, *415.
—Meter test car, Details, Atlanta, Ga., *726.
—Modern machine tools for, Comments on, 1038.
—New use for old rails, Augusta, Ga., *642.
—Parts manufacture by railways, Comments on, 310.
—Plate glass protects lathe operator, *767.
—Plug fuse, Improved type, *768.
—Pneumatic tires on acetylene welding truck, *934.
—Portable machines for, Comments on, 1038.
—Renewal parts, Cost of [Dalgleish], c112.
—Sandpapering device for wood finishing, Toledo, Ohio, *642.
—Shop furniture standardized, Comments on, 831.
—Taper pin reamer shows reduction in torque, *728.
—Waste cans insure uniform saturation, *1018.
—Wheel hoist for raised pit, Mobile, Ala., *455.
—Wire brush cleans wheels, *1115.
Repair shops and equipment (see also Painting and Repair shop practice):
—Angle plate for grinders, *561.
—Atomizing oil burner, *117.
—Aurora, Ill., Combination shop and carhouse, Details [Vernon], *841.
—Ball bearing chain hoist, *294.
—Band saw, Metal cutting, *117.
—Chicago, Aurora & Elgin R.R. increase capacity of, *439.
—Circular saw, Portable, *892.
—Commutator slotting attachment for lathe, *892.
—Drum controller, wall-type, *728.
—Furnaces, Calorizer equipment for, *207.
—Havana, Cuba, Woodworking machinery [Gottschalk], *113.
—How to select shop equipment, *490.
—Labor-saving equipment reduces maintenance costs, Comments on, 474.
—Modern machine tools needed, Comments on, 663.
—Oil handling facilities, Boston, Mass., *1058.
—Pipe-threading machine, Portable, *81.
—Shop cleaning, Comments on, 832.
—Skylight scaffold, Boston "L," *80.
—Small tools, Importance of [Read], c512.
—Soldering irons, electric, 457.
—Special devices for repair work, Comments on, 662.
—Starter, New type, *561.
—Tilting frame for motor driven saw, *936.
—Wood-block flooring for, Los Angeles, Cal., *207.
—Wrench set, Detachable, *116.
Rhode Island:
—Power companies agreement, 606.
—Suspension of buses not bonded, 1124.
Richey's computation of indexes for 1925, *37; Comments on, 2.
Richey's Conspectus of indexes, 173, 380, 569, 739, 949, *1126.
—Virginia Electric & Power Co.:
Adjustable armature carrier, *515.
Richmond, Va.:
Annual report, 1031.
Brake release failures reduced, *456.
Brake rods kept off motor cases, *414.
Bus and trolley co-ordination program, 869.
Cars ordered, Specifications, 532, 703, *953.
Franchise negotiations, 83, 339, 733, 772. 858, 899, 939, 984, 1923, 1073.
New cars demonstrated, 1068.
Posters advertise service, *724.
Rolling stock improvements, *500.
Rochester, N. Y.:
—Canal-bed railway construction progress, 771.
—New York State Rys.:
Accident prevention contest, 261.
Advertising campaign, Syracuse, 338.
Appraisal suit, 300, 568, 1076.
Bus extension plans, 818.
Bus subsidiary, Annual report, 380.
Canal bed line operation, 166.
Electric track switches, operating methods [Brown], *105.
Fare controversy, 126, 128, 335, 419, 605, 691, 693, 694, 1025.
Financial reports, 172, 569, 1078.
Improvement program, Syracuse, 745.
Limited cars for rush-hour service, 210.
School children entertained, 1121.
Special work thermit welded, *373.
Union terminal for trolley and bus lines, 882.
Wage increase negotiations, 460, 565, 692, 734, 861, 900, 943.
—Oil-electric locomotives for canal bed line, 1072.
—Subway freight and passenger service plans, 858.
Rockford, Ill.:
—Rockford, Beloit & Janesville R.R. Reorganization plans, 1032.
—Rockford City Traction Co.:
Receiver appointed, 343, 382.
Receiver's rights questioned, 865.
Suspension deferred, 524.
—Rockford & Interurban Ry.:
Protective committee requests deposit of bonds, 993.
Receiver appointed, 342, 382.
Route Signs:
—Improvement of sign conditions, Comments on, 95.

S

Sacramento, Cal.:
—Traffic survey to be made, 900.
—Union station built, *969.
Safety work:
—Accident contest, Savannah, Jacksonville and Tampa, Fla., 648.
—Accident prevention contest, Chicago, 461.
—Allentown, Pa., Safety campaign, 45.
—Baltimore, Md., Week-end safety drive, 1121.
—Crossing protection necessary, Comments on, 432.
—"Magnetic flagman" a crossing protection, 53.
—Materials handling a factor in, 177.
—Nashville, Tenn., Accidents reduced, 128.
—Public safety demonstration, El Paso, Tex., 1098.
—Safety committees formed, Springfield, Ohio, *773.
—Safety contest reduces accident costs, 630.
—Safety zones constructed in Terre Haute [Walker], *319.
—Safety talks for school children, Atlanta, Ga., 1073.
—Safety zone markers, *979.
—Safety zones, Development, Comments on, 748.
—Synchronized signals, Effect on [Miller], *580.
—Too much caution hampers speed, Comments on, 957.
—Trainmen make safety suggestions, Cleveland, Ohio, 927.
—Traveling car advocates safety, Joliet, Ill., *1100.
St. Catharines, Ont., Can.:
—Niagara, St. Catharines & Toronto Ry.: Overhead construction design, Details [Villiers], *759.
St. Louis-Kansas City Short Line R.R. (see St. Louis, Mo.).
St. Louis, Mo.:
—St. Louis-Kansas City Short Line Ry. Certificate of convenience refused, 169.
—St. Louis Public Service Co.:
Fare increase sought, 986; Details, 1023.
Franchise negotiations, 900, 944, 987, 1121, 1122.
Trading in securities starts, 866.

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St. Louis, Mo (Cont.):
—United Railways Company of St. Louis:
Accident record, 1925, 365.
Annual report, 822.
Bonds called for payment, 525.
Bus competition reduces fares, 171.
Claims for service fees disallowed, 949.
Franchise negotiations, 166, 209, 259, 646, 693, 900, 944, 987.
Power plant burns, 648.
Property expansion, 443.
Reorganization plans, 46, 84, 131, 342, 422, 568, 653.

Salt Lake City, Utah:
—Salt Lake & Utah R.R.:
Annual report, 864.
Personnel reorganization, 50.
—Utah Light & Traction Co.:
Abandonments and bus petitions, 378.
Fares increased, 647, 944.
Wage increase, 564.

Sand blasting used to remove paint, Mobile, Ala., *598.

San Francisco, Cal.:
—Ferry petition denied, 565.
—Market Street Ry.:
Annual report, 612.
Development plans, 85.
Wage increase, 374.
—Municipal Railway of San Francisco:
Accidents reduced, 976.
Accounting revised, 49, 823.
Annual report, 213.
Extensions proposed, 139.
Wages increased, 564, 691, 774.
—San Francisco-Sacraento, R.R.:
Annual report, 1032.

Savannah, Ga.:
—Jitney service suspended, 83.
—Savannah Electric & Power Co.:
Accident contest won from Jacksonville and Tampa, 648.

Schedules and time tables:
—Atlanta, Ga., Improved schedules, Details, *792.
—Buffalo & Erie Ry. schedules, Details, *58; Comments on, 56.
—Buses faster than cars in New York [Transportation], c195, [Fair Play], c325.
—Chicago Surface Lines, scientific schedule construction [Gordon], *708.
—Clarksburg, W. Va., Service speeded up, 68.
—Cleveland, Bus schedule, *545.
—Milwaukee, Headway recorders, Details, *279.
—New Orleans, La., Keeping cars on schedule, Method, *631.
—Operating speed increased, Detroit, *356.
—Pittsburgh, Pa., Parking restrictions speed up cars, 362; Comments on, 351.
—Timetables distributed by trainmen, Poughkeepsie, N. Y., *640.
—Tramway schedules, South Africa [Edward], *403.

Scranton, Pa.:
—Scranton Ry.:
Wage agreement, 523, 563.

Seats:
—Aluminum protection for seat ends, *1059.
—British tramways, Improvements in, *1109.
—Cane seats, Cleaning by machine, *80.
—Chicago elevated cars, Arrangement [Lee], *182.
—Design adopted by Chicago, Aurora & Elgin R.R., *439; Comments on, 433.
—Leather upholstered seats popular, Cleveland, *844.
—London, England, Cushioned seats for comfort, 284.
—Miami, Fla., Slate and book-type, *283.

Seattle, Wash.:
—Municipal bus operation considered, 991.
—Puget Sound Power & Light Co.:
Interurban and stage terminal, 524.
Tax issue to be decided by U. S. District Court, 992.
—Seattle Municipal Ry.:
Annual report, 820.
Buses ordered, 1131.
Car purchase terms, 744.
Employees ask for pension system, 816.
Employees in service, 1919-1925 [Henderson], c325.
Energy saving campaign, Results [Goodwin], *799.
New cars, Specifications, 620.
Traffic survey, Laymen's report, 938; Comments on, 912.
—Seattle & Rainier Valley Ry.:
Municipal ownership proposal, 44, 169, 606.
Suit holds up sale, 343.
Transfer privileges curtailed, 649.

Service and tower trucks:
—Acetylene welding truck, Pneumatic tires for, *934.
—Dump truck, Design, Details, *165.
—Electric and gasoline, South Africa [Edward], *403.
—Electric shop truck, Milwaukee [Payne], *109.
—Elevating platform truck for shop uses, *812.
—Equipment for overhead construction, Atlanta, Ga., Details, *672.
—Ford truck for sanding track, Erie, Pa., *684.
—Light truck for express delivery, *963.
—Power-operated, Four-section tower truck [Brittain], *256.
—Truck for street car wrecking [See], *327.

Shreveport, La.:
—Shreveport Rys.:
Fares increased, Litigation ended, 1025.

Signals:
—A.R.E.A. report on, 519.
—Block signal failures, Report, Portland, Ore., [Charters], *559.
—Crossing signal installation rules, New York, 668.
—Grade crossing and block signals, Chicago, Aurora & Elgin R.R., *392.
—Interlocking towers, Skokie Valley line, Highwood, Ill., *1043.
—Operation and maintenance, Chattanooga, Tenn., *685.
—Prefocused lamp and socket for, 600.
—Right-turn signals installed, Louisville, Ky., *371.
—Synchronized signal control hampers traffic [Miller], *580; Comments on, 577.
—Synchronized signals to be interlocked, New York City, Comments on, 873.
—Traffic signals relieve congestion, Chicago, [Dewhurst], *536; Comments on, 577.
—Traffic signals used in Winnipeg, Can., [Stewart], *756.
—Unit flasher for, Motor-driven, *330.

Sioux City, Ia.:
—Sioux City Service Co.:
Franchise voted, 128.

Sioux Falls, S. D.:
—Sioux Falls Traction Co.:
Fares increased, 774.
Voters to decide fate, 523.

Snow and ice removal:
—Cleaning snow from city streets, Comments on, 274.
—Hot brine clears car tracks, 314.
—Scraper car, New York, *559.

South Africa:
—Tramway operation in Johannesburg, Details [Edward], *403.

South American journalists study U. S. industry and highways, 692.

South Bend, Ind.:
—Chicago, South Bend & Northern Indiana Ry.:
Bus fares increased, 340.
Bus service expanded, 819.
Fare increase sought, 212, 337.
Interurban and bus developments [Smith], 250.

Southern Pacific R.R. (see Beaverton, Ore.).

Southwestern Public Service Assn.:
—Annual meeting, Report, 688; Comments on, 706.

Special trackwork:
—Connecting rod reduces track switch failures, Portland, Ore. [Charters], *598.
—Crossing insert, Angleblock, *318.
—Manganese, Welding practice, Denver, 292.
—Maintenance practice, New Orleans, *631.
—Sheboygan, Wisc., Reconstruction [Oldfield], *102.
—Thermit welding for, *373.
—Track crossings reduce noise, Cleveland, *511, on, 475.
—Track crossing with manganese filler, *851.

Spokane, Wash.:
—Spokane United Rys.:
Reorganization, 651.
Fare increase, 44, 85, 211.
Obsolete cars burned, 419.
Wages increased, 339.

Springfield, Mass.:
—Springfield Street Railway:
Annual report, 302.
Bus permit granted, Westfield, Mass., 902.
Patrons to suggest design for new car, 746.
Rehabilitation plans, 416,460.
Traffic survey progressing, 262.

Springfield, Ohio:
—Columbus-Dayton Transportation Co.:
Wheel-aligning gage, Details [Foote], *890.

Springfield, Ohio (Cont.):
—Indiana, Columbus & Eastern Traction Co.:
Dayton-Union City line abandoned, 173.
Franchise for Bellefontaine rejected, 736.
Rubber washers made from old tires [Foote], *599.
Safety committees formed, *773.

Standardization:
—Air brake equipment, Six-wheel buses, 572.
—American Engineering Standards Com.:
Gage standard, 125.
Track bolts and nuts, 894.
Unification of wire and sheet metal gages, 161, 690.
—Bus equipment standardized, Newtonville, Mass., *801.
—Carbon brushes and shunts, Dimensions listed, 937.
—Freight trailer equipment, Specifications, *237; Comments on, 225.
—International standardization conference, Progress, 769.
—Lamps for street cars, 471.
—Motor bus, Progress of, Comments on, 578.
—Three-door car, Melbourne, *402.
—Wheel gages, 412.

Staten Island Midland Ry. (see New York City).

Staten Island Rapid Transit Co. (see New York City).

Statistics:
—Abandonments, 1925 reviewed, *15; Comments on, 3.
—Accident record, Attleboro, Mass., *719.
—Accidents, 1925, St. Louis, Mo., 365.
—Age of electric passenger cars, 1096.
—Automotive equipment, Railway purchases, 1925, *29; Comments on, 2.
—Berlin, traffic carried by different transit systems [Pforr], *c725; Comments on 706.
—Block signal report, 1921-25, Portland, Ore. [Charters], *559.
—Bond issues and maturities, 1925, *13; Comments on, 4.
—Buenos Aires tramways, 990.
—Buffalo & Erie Ry., Revenue growth, Details, *58; Comments on, 56.
—Bus operation, Boston "L," [Dana], *757; Comments on, 747.
—Bus operation by electric railways, 1925, *29; Comments on, 2.
—Bus replacements of electric railways, Extent of, 242.
—Bus statistics from eight states, 288.
—Car orders, 1925, New York City, 177.
—Cars, 1925 orders analyzed, *19; Comments on, 3.
—Cars, Passenger, classified by age, *25; Comments on, 2.
—Chicago, Aurora & Elgin R.R., Income statement, 1922-1925, *357.
—Electric passenger cars in the U. S., *1086.
—Electric railway conditions, 10 yr. period [Richey], 281.
—Employees in Seattle, Wash., 1919-1925 [Henderson], c325.
—Extent of electric railway industry, 64.
—Heavy electric traction, 1925 work reviewed, 28.
—Italian electrified operation, 25 years, *1002; Comments on, 999.
—Market conditions in 1925 reviewed, *52.
—Passengers carried, 1920-25, Atlanta, Ga., *792.
—Passengers carried by railway, Milwaukee, Wis., 1015.
—Photograph, Use by railways, 50 companies, *65.
—Power conservation, 7 years, Seattle, Wash. [Goodwin], *799.
—Railway costs and fares, 1925 [Richey], *37; Comments on, 2.
—Receiverships, 1924 reviewed, *41.
—Repair materials used yearly, Des Moines, Ia. [McMahon], *483.
—Reports, Financial:
Akron, Ohio, 646, 866.
Allentown, Pa., 823.
Albany, N. Y., 739.
Annual reports as public relations material, Comments on, 789.
Attleboro, Mass., Seven months', *719; Comments on, 707.
Baltimore, Md., 48.
Boston Elevated Ry., *300, 466; Comments on, 351.
Brill Co., 387.
Capital Traction Co., 948.
Central California Traction Co., 949.
Chicago Rapid Transit Co., 379.
Chicago Surface Lines, 651, 906.
Cincinnati Street Ry., 264, 905.
Columbus, Newark & Zanesville Electric Ry., 1924-1925, *396.

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Statistics:
—Reports, Financial (Cont.):
Community Traction Co., 173, 612.
Denver Tramway Corp., 266.
Department of Street Rys., Detroit, Mich., 132, 381, 570, 739, 993.
Des Moines, Iowa, 782.
Duluth, Minn., 463.
East Avenue Bus Co., Rochester, 380.
Gary Railways, 422.
Grand Rapids Ry., 215, 905.
Halifax, Nova Scotia, 739.
Havana, Cuba, 1126.
Highwood, Ill., 820.
Illinois Power & Light Corp., 1125.
Indianapolis Street Ry., 341, 1076.
Interborough Rapid Transit Co., 49, 215.
International Ry., 698.
Interstate Public Service Co., 1031.
Kansas City, Clay County & St. Joseph Ry., 1077.
Kansas City Rys., 864, Bus operation, 818.
Long Island R.R., 822.
Louisville Ry., 423.
Market Street Ry., 612.
Midland Utilities Co., 464.
Milwaukee Electric Railway & Light Co., 341.
Minneapolis Street Ry., 777.
Municipal Ry. of San Francisco, 213.
New Brighton, Pa., 740.
New York, New Haven & Hartford R.R., 865.
New York State Rys., 172, 569, 1078.
Oakland, Cal., 993.
Ohio Traction Co. assets, 822.
Oklahoma City, Okla., 172.
Ottawa Traction Co., 992.
Pacific Electric Ry., 823.
Philadelphia Rapid Transit Co., 949.
Pittsburgh Rys., 342, 697.
Public Service Corporation of New Jersey, 525, 822, 1126; Comments on 535.
Quebec, Canada, 1030.
Railway operation, 1925, A.E.R.A. report, 777.
Richmond, Va., 1031.
Salt Lake & Utah R.R., 864.
San Diego, Cal., 698.
San Francisco-Sacramento R.R., 1032.
Seattle, Wash., 820.
Springfield, Ill., 696.
Springfield Street Ry., 302.
Staten Island Midland Ry., 48.
Staten Island Midland Ry., Trackless trolley, operation, 1921-1925, 521; Comments on, 533.
Syracuse Railways Co-ordinated Bus Lines, Inc., 128.
Tacoma, Wash., 653.
Texas Electric Ry., 568.
Toledo, Ohio, 424, 905.
Twin City Rapid Transit Co., 614.
Union Traction Co., Anderson, Ind., 823.
United Rys. of St. Louis, 822.
Washington, Baltimore & Annapolis R.R., 613.
Washington Railway & Electric Co., 992.
—Ticket sales, 1925, New York City, 320.
—Track construction, 1925 reviewed, *15; Comments on, 3.
—Traffic signals, Effect on railway operation [Miller], 580; Comments on, 577.
—Trolley wire breaks, Boston, 3 years, *837.
—Wage rates increase, 1913-1920, 595.
—Chicago, Aurora & Elgin R.R., *439; Comments on, 433.
—Vienna electrification traffic, 724.

Stores:
—Armature rack for, *515.
—Armature racks from old rails, *767.
—Arrangement of materials, Comments on, 1037.
—Axle bearing storage, 257.
—Bolt rack in shop, Grand Rapids, Mich., *1115.
—Labeling parts in storeroom shelves, *329.
—Paints and oils storage, *496.
—Paint storage, Detroit, Mich., *1059.
—Purchases and stores department economies discussed by N. E. St. Ry. Club, 854.
—Quantity buying for small railways [Fuller], 893.
—Racks for car repair materials, Des Moines, Ia. [McMahon], *483.
—Rail and pole, Racks for, *514.
—Steel cabinet for storing hand brushes, *977.
—Trolley catchers, Racks for, *890.

Storm and fire damage:
—Oil City, Pa.:
Flood causes service suspension, 562.
Transportation during flood, *1013.
—Ontario, Can., Storm affects railway, 694.
—St. Louis, Mo. Power plant burns, 648.
Street traffic congestion (see also Signals, Street):
—A. E. R. A. committee report, 690, 1117.
—Atlanta, Ga., Stops eliminated to relieve, 860.
—Baltimore, Md., Cars rerouted, 335, 1026.
—Chicago stores check on customers using parking space, 722; Comments on, 707.
—Co-ordinated light and rerouting speed up traffic [Dewhurst], *536.
—Decentralization relieves, Comments on, 1001.
—Detroit, Mich.:
Cars rerouted to relieve, 860.
Highway plans, Progress, 43.
Problem discussed [Wallace], 369.
—Engineering Council of Utah discuss, 549.
—London, England, Bus service reduced to relieve, *635; Comments on, 623.
—New York City traffic report on, 985.
—Parking plan extended, Philadelphia Rapid Transit Co., *722.
—Parking problem, Comments on, 622, 791.
—Parking restrictions discussed by, A.E.C.E., 982.
—Parking restrictions relieve, Pittsburgh, Pa., 362; Comments on, 351
—Reduction in hours of labor, N.Y.C., Comments on, 353.
—Staggered hours proposed in New York City, Comments on, 353.
—Stagger system suggested, Pittsburgh, Pa., 1122.
—Suggestions for relief [Coates], 729; 611; Comments on, 706, 579.
—Traffic control is essential to relieve [Coates], 852.
—Traffic police officers discuss, Galveston, Comments on, 789.
—Transportation men can help, Comments on, 790.
—U.S.C. of C. discusses, 852.
—Use of bus to relieve [Miller], *813.
Strikes and arbitrations:
—Akron, Ohio, Strike Details, 815, 857, 899, 942; Comments on, 833, 957.
—Connecticut Co., Arbitration award, 44.
—Great Britain:
Service restored, Details, 1028.
Transportation provided during strike, 940; Comments on, 911.
—Jackson, Mich., Arbitration settles dispute on bus wages, 902.
—Memphis, Tenn., Arbitration, 936, 1123.
—Pottsville, Pa., Arbitration agreement, 989.
Substations and equipment:
—Automatic:
Chicago, Aurora & Elgin R.R., *593.
East Liverpool, Ohio, Details, *1101.
Skokie Valley line, Highwood, Ill., *1043.
—Meter case for watt-hour meters, *851.
—Overhead relay redesigned, 768.
Subways (see Rapid transit).
Switzerland:
—Locomotive-car developed, Details, *321.
Syracuse, N. Y.:
—Auburn & Syracuse Electric R.R.:
Protective committee formed, 904.
—Bus service, Annual report, 128.
—New York State Rys. (see Rochester, N.Y.).
—Traffic signals, Effect on railway operation [Miller], *580.
—Traffic survey being made, 416.

T

Tacoma, Wash.:
—Bus service controversy, 259, 338, 1074; Comments on, 274.
—Tacoma Railway & Power Co.:
Annual report, 653.
Department store charters cars, 649.
Terms of new agreement with city, 1072, 1119; Comments on, 1084.
—Transit problem to be settled by new mayor, 503, 1072, 1119; Comments on, 1084.
Tampa, Fla.:
—Florida Interurban Rapid Transit Co.:
Construction progress report, 733.
—Tampa Electric Co.:
Buses operated at loss, 902.
Cars ordered, Specifications, 140.
Improvement program, 701.

Taxes:
—Federal income tax bill, exemptions asked, 120.
—Gasoline tax increased, Kentucky, 378.
—Hartford & Springfield Street Ry. state taxes abated, 655.
—Minnesota railway bus tax, 378.
Taxes (Cont.):
—Seattle tax issue to be decided by U. S. District Court, 992.
—Taxation relief for railways necessary [Nash], 967.
—Tax reduction suit, Akron, Ohio, Details, 88.
—Transit regulation by taxation, Comments on, 749.

Taxicabs:
—Chester Valley lines to operate, 1124.
—Fare increase, New York City, Comments on, 749.
—P.R.T. to operate, 260, 734; Comments on, 97.
Tennessee Electric Power Co. (see Chattanooga, Tenn.).
Terminals and waiting stations:
—Buffalo & Erie Ry., *58; Comments on, 56.
—Culverts for, *163.
—Indianapolis bus terminal closed, Details, 566.
—Passenger stations, New, North Shore road, 798.
—Rochester, N. Y., Union terminal for trolley and bus lines, 882.
—Seattle, Wash., Interurban and stage terminal, 524.
—Skokie Valley line, Highwood, Ill., *1043.
—Union station, Sacramento, Cal., *969.
Terre Haute, Indianapolis & Eastern Traction Co. (see Indianapolis, Ind.).
Tests of materials and equipment:
—Armature testing, Chicago, Details [Wheeler], *834.
—Bus wheel tests, 830.
—Carborundum track brakes, 767.
—Creosoted pine poles [Braunig], *937.
—Electric locomotive overload tests, 185.
—Electric locomotive test, Paris, 809.
—Electric train test in Sweden, 377.
—Gaging gears and pinions for wear, Details [Sawtelle], *323.
—Gas-electric buses, 1129.
—Gas-electric car demonstration, *93.
—Gear noise reduction tests [Sawtelle], *184.
—Rail bond resistance tests [Lovell], *312.
—Rail bonds, Tester for, *81.
—Rail corrugation tests, Europe, 1056.
—Regenerative braking tests, Chicago Elevated [Aspinwall], 447.
—Speed test, cars and buses, New York City, 67; [Transportation], c195.
—Ties, Service and life test rules, 518.
—Traction recorder for car operation tests [Swan], *845.
—Trolley car vibrations help hearing, Tests, 773.
—Trolley poles and wheels, *727.
—Water rheostat test for gas-electric buses, *766.
Texas Electric Ry. (see Dallas, Tex.).
Third Avenue Ry. (see New York City).
Tickets and tokens (see Fare collection).
Timetables (see Schedules).
Tires for Buses:
—Balloon tires, Use increasing, 870.
—Cincinnati tire contract, 1081.
—Mileage selling plan opposed by manufacturers, 306.
Token clearing house needed [Speed], c596; [Sherion], c682; Comments on, 579.
Toledo, O.:
—Community Traction Co.:
Bus feeder lines, 421.
Bus service during repaving, 903.
Annual report, 173, 424, 612, 905.
Rehabilitation plans considered, 732.
Sandpapering device for wood finishing, *642.
Traffic report basis for new franchise, 943.
Traffic survey, Riggs report approved, 168.
Transit topic taken up with mayor, 562.
Wage negotiations, 900, 1122.
Toronto, Ont., Can.:
—Hydro-electric Rys.:
Headlights used for park lighting, 373.
Posters advertise service, *278.
—Toronto Transportation Commission:
Advertising on car cards, *398.
Budgetary control effects saving [Patten], *1063.
Bus service for crippled children, *775.
Bus service, supplementary, Details, 284.
Car designs standardized, Methods, Details, *98.
New railway line for suburbs opened, *337.
Overhead construction maintenance [Neild], *479.
Radial line deficit explained, 213.
Trolley loops made into parks, *964.
Tower wagons (See Service and Tower Trucks).

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Track abandoned (see Discontinuance of Service).
Track construction (see also special track work):
—A.R.E.A. report, 518.
—Augusta, Ga., Concrete used, Details, *206.
—Ballast, A.R.E.A. revised rules, 519.
—Bridge, Temporary, Milwaukee, 40.
—Chicago, Aurora & Elgin R.R., Details, *392.
—Chicago, South Shore & South Bend R.R. rehabilitation work, 24.
—Gage changed overnight, New Orleans, La., Details [Meyers], *585.
—Labor saving equipment for, *493; New Orleans, Details, *664.
—Material handling equipment reduces time for, *495.
—Milwaukee rapid transit line, Details, *679.
—Rail gringer, Improved type, *600.
—Reconstruction work, East Liverpool, Ohio, Details, *1101.
—Relaying track at night, *489.
—Review of 1924, Statistics, *15; Comments on, 3.
—Sesqui-Centennial extension, Philadelphia, Pa. [Thayer], *919.
—Sheboygan, Wisc., Methods, Details [Oldfield], *102.
—Skokie Valley line, Hihgwood, Ill., *1043.
—Thermit welding used in New Bedford, Mass., *678.
Trackless trolleys:
—Darlington, England, installs, 377.
—England, Development of, 170.
Track maintenance:
—Ballast dipper for, 414.
—Ford truck used for sanding track, Erie, Pa., *684.
—Influence of proper maintenance, Comments on, 663.
—Inspection car, Roller bearings, *686.
—Labor saving equipment for, New Orleans, La., Details, *664.
—Quiet track gives low cost [Bean], 503.
—Third rail insulator maintenance [McKelway], *113.
Track switches, Operating methods, Rochester, N. Y. [Brown], *105.
Traffic Investigations:
—Baltimore, Md., Engineers' report, 168, *883, *923; Comments on, 143, 872, 913.
—Bay Cities, Cal., Survey suggested, 336.
—Bus and railway operation, A.E.R.A. survey, 1027.
—Chicago, Ill., Merchants check customers using parking space, 722; Comments on, 707.
—Cincinnati, Ohio, Survey to be made, 1123.
—Cleveland, Ohio, Merchants surveys, 1025.
—Cleveland, Ohio, Report, *589.
—Harrisburg and Lancaster, Pa., Plans, 647.
—Milwaukee, Wis., Survey suggested, 1119.
—New York City, Report by Regional Plan Committee, 458.
—New York City's greatest traffic points, 320.
—North Jersey, Rapid transit plan proposed, *239.
—Pittsburgh, Pa., Boy Scouts aid survey, *912.
—Sacramento, Cal., Survey to be made, 900.
—Seattle, Wash., Laymen's report, 938; Comments on, 912.
—Springfield, Mass., Survey, 84, 262.
—Syracuse, N. Y., 416.
—Toledo, Ohio, Engineer's report, 168, 943.
—Westchester, N. Y., Engineer's report, 773.
—Worcester, Mass., Report, 375.
Traffic Regulation:
—Bill to regulate interstate buses in New York-New Jersey tunnel, 863.
—Brass cups for traffic markers, 768.
—Police officers can improve transportation [Good], 1015.
—Synchronized signal control hampers traffic [Miller], *580; Comments on, 577.
—Traffic control is essential [Coates], 852.
—U.S.C. of C., Comments on, 871.
Traffic Stimulation (see also Merchandising Transportation).
—Advertising campaign increases traffic, Details, *753.
—Birmingham, Ala., "Use the car" campaign, *210.
—Chicago, Holiday traffic, 112.
—Detroit, Mich., 850 car stops eliminated, 1120.
—Modern cars increase traffic, Morristown, N. J., *763.
—Patronage attracted by equipment [Harvie], 197.
—School regulations expedite car loading, Chicago, 376.
—Superiority of straight-line operation [Jackson], c682.
—Toronto, Supplementary bus service increases riding, 284.
Transfers (see Fare collection).
Transformers (see Power distribution).
Transportation, Metropolitan (see also Motor bus, field for and Rapid Transit):
—Atlanta, Ga., Local problems solved, Details, *792.
—Broadening conception of, Comments on, 621.
—Discussed by A.E.R.A. Advisory ouncil, Details, 1040; Comments on, 1037, 1038.
—Future predicted by Mr. Alfred, Comments on, 391.
—New York-New Jersey interstate loop plan, Analysis [Miller], *44; Comments [Mantell], [Saunders], c449; [Brinckerhoff], [Garber], c450.
—Place of the motor bus in [Budd], 715; [Buffe], 717; Comments on, 705.
—Points on which traction and city officials should agree [Capes], 200.
—Trolley company as complete transportation agency, 411.
Trenton, N. J.:
—Trenton & Mercer County Traction Co.: Bus operation, City and interurban, *67.
Trolley base, Roller bearing, *117.
Trolley buses (see Trackless trolleys).
Trolley wheel and harp, New type, *768.
Trolley wheels:
—Bushing press for, Denver, *115.
Trolley wire:
—Anchor plate for *328.
Trucks:
—Grand Rapids, Ry., new cars, *914.
—Modernization methods [Brown], *104; Comments on, 95.
Tucson, Ariz.:
—Tucson Rapid Transit Co.: Buses ordered, *909.
Tulsa, Okla.:
—Transportation agencies unified, 611.
Tunnel cleaning, Brooklyn, 1099.
Twin City Rapid Transit Co. (see Minneapolis, Minn.).

U

Unemployment (see Employees and Labor).
Union Internationale de Tramways, de Chemines de Fer d'Interêt Local et de Transports Publics Automobiles:
—Annual convention Barcelona, Spain, Program, 161.
Union Street Ry. (see New Bedford, Mass.).
Union Traction Company of Indiana (see Anderson, Ind.).
United Electric Rys. (see Providence, R. I.).
United Railways Company of St. Louis (see St. Louis, Mo.).
United Railways & Electric Co. (see Baltimore, Md.).
United States Chamber of Commerce:
—Annual meeting, Plans, 745; Comments on, 871.
—Election of director, Candidate indorsed, 370.
—Traffic congestion relief discussed, 852.
United Traction Co. (see Albany, N. Y.).
Utah Light & Traction Co. (see Salt Lake City, Utah.)
Utility information bureaus (see Public, Relations with).

V

Valuation (see Appraisal of railway property).
Vancouver, B. C., Can.:
—British Columbia Electric Ry.:
Bus expansion plans, 819.
Customer-ownership campaign, 465, 612.
Virginia Electric & Power Co. (see Richmond, Va.).

W

Wage decreases:
—Philadelphia, Pa., 416; Comments on, 391.
Wage increases:
—Cedar Rapids, Iowa, 338.
—Cleveland, Ohio, 988 .
—Detroit, Mich., 337, 1119.
—Illinois Traction System, 45, 169.
—Jacksonville, Fla., 46.
—Louisville, Ky., 564.
—New Haven, Conn., 944.
—San Francisco, Cal., 374, 774.
—Spokane, Wash., 339.
—Utah Light & Traction Co., 564.
—Winnipeg, Can., 898.
Wages and working agreements:
—Auburn, N. Y., Increase asked, 736.
—Chicago elevated men ask wage increase, 857.
—Community Traction Co., Negotiations, 900, 1122.
—Connecticut Co., Arbitration award, 44.
—Conspectus of indexes, 173, 380, 569, 739, 949, 1126.
—Cultural wage advocated, Comments on, 913.
—Detroit, Mich., Municipal employees seek increase, 898.
—European railway wages, 365.
—Indianapolis, men demand increase, 1027,1123.
—Java electrified line [Balsem], *191.
—Memphis, Tenn., Arbitration, 736.
—Milwaukee, Wis., Agreement renewed, 168.
—Newark, N. J., Wage issue up, 986.
—New Haven, Conn., Increase asked, 608, 944.
—Pittsburgh, Pa., Agreement renewed, 735.
—Providence, R. I., New agreement submitted, 988.
—Rates increase faster than cost of living, Statistics, 595.
—Rochester, N. Y., Controvery, 734, 861, 900, 943.
—Scranton, Pa., Wage agreement, 563.
—Toledo, Fostoria & Findlay Ry., 129.
—Trend in 1925 [Richey], *37; Comments on, 2.
—Winnipeg, Can., Controversy, 898, 989.
Waiting stations (see Terminals and waiting stations):
Walla Walla, Wash.:
—Walla Walla Valley Ry.:
Railway operation discontinued, 171.
Warehouse Point, Conn.:
—Hartford & Springfield Street Ry.:
Foreclosure, 266, 569, 782.
Service abandoned, 1077.
Survey to be made, 491.
Warren, Pa.:
—Warren & Jamestown Street Ry.: Modernization program, Results, *1086.
Washington, Baltimore & Annapolis Electric Ry. (See Baltimore, Md).
Washington, D. C.:
—Bus fares lowered, Three months' trial, 86.
—Capital Traction Co.:
Annual report, 948.
Bus fare lowered, 46.
De luxe bus service, Details, *276; Comments on, 275.
Personnel changes, 784.
—Railway-bus service proposal, 900.
—Railway merger proposed, 1026.
—Service-at-cost bus operation suggested, 47.
—Traffic signals, Effect on traffic [Miller], *580.
—Washington Railway & Electric Co.:
Annual report, 992.
Bus fares increased, 379.
Bus fare lowered, 87.
Car and crankcase oil reclaimed, *1055.
—Washington Rapid Transit Co.:
Complaint against "rubber-necks," 563; Comments on, 534.
—Washington-Virginia Railway:
Bus line sold to competitor, 570.
Waukegan, Ill.:
—North Shore & Waukegan Ry. incorporated, 774.
Weekly pass (see Fares).
Welding:
—Acetylene welding truck, *978.
—Automatic arc, For wheel flanges [Brittain], *413.
—Copper tungsten electrode for, 516.
—Electric welding speeds repairs, *491.
—Gas-welding rail bonds, Details [Lovell], *312.
—Gas welding torch, *812.
—Pipe welding discussed by American Welding Society, 769.
—Rail welding practice, Europe [Tinnon], c597.
—Thermit, Used on special trackwork, *373.
—Thermit welds used in rapid track construction, New Bedford, Mass., *678.
Westchester Electric R.R. (see New York City).
West Milton, Ohio:
—Dayton, Covington & Piqua Traction Co.:
Rehabilitation programs, 786.
Syndicate may purchase, 342.
West Penn Rys. (see Pittsburgh, Pa.).
Wheeling, W. Va.:
—Wheeling Traction Co.:
Contract for Mozart Hill line proposed, 296.
Interstate Sunday passes installed, 210.
Veterans' Association entertainment, 288.
Weekly pass installed, 772.

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Wheels and axles:
—Axle equipment for New Jersey buses, *177.
—Car noises caused by [Williams], *476.
—Grinding equipment, *1059.
—Wide gaging wheels, New Orleans, La., 685.
White Plains, N. Y.:
—Westchester Street Ry.:
Abandonment objected to by patrons, 986.
Service abandoned, 821.
Williamsport, Pa.:
—Traction companies merge, 89.
Willoughby, Ohio:
—Cleveland, Painesville & Eastern R.R.:
Disposition of railway undecided, 342.
Sold to power company, 174.
Winnipeg, Man., Can.:
—Winnipeg Electric Co.:
Ejecting passengers, Rules, 693.
Winnipeg, Man., Can.
—Winnipeg Electric Co. (Cont.):
Traffic signals used, Details [Stewart], *756.
Wage controversy, 898, 989.
Wisconsin Power & Light Co. (see Oshkosh, Wis.).
Wisconsin, State of:
—Experience with indeterminate permit [Gettle], 980.
Wood preservation:
—A.R.E.A. report, 520.
—Creosoted pine poles, Life of [Braunig], *937
Worcester, Mass:
—Worcester Consolidated Street Ry.:
Traffic investigation report, 375.
Working agreements (see Wages and Working Agreements).
Wrecks (see Accidents).

Y

Yale University offers transportation fellowship, 184.
Youngstown, Ohio:
—Pennsylvania-Ohio Electric Co.:
Bus service exanded, 775, 818.
Interurban railway and bus developments [Graham], 251.
New cars advantageous, Details, *1086.
—Youngstown Municipal Ry.:
Bus service on former car line, 130.
Cars ordered, Specifications, *659.

Z

Zanesville, Ohio:
—New cars effect savings, Details, *396.
Zion, Ill.:
—Bus restrictions, Court decision [Hueneryager], c1113.
Zone fare systems (see Fares).

AUTHOR INDEX

A

Adams, H. H.:
—Rapid overhauling permits maximum holiday service, *188.
Appel, L. H.:
—Double sectionalizing switch for oil sidings, *329.
Arnold, B. W.:
—Operate motor coaches for profit, not loss, 557.
Aspinwall, L. M.:
—Regenerative braking tried on multiple-unit trains, 447.

B

Bale, L. D.:
—Cleveland on an all-substation basis, 714.
Balsem, C. F.:
—Java starts electric trunk line, *191.
Bean, H. E.:
—Quiet track gives low maintenance cost, 503.
Beeler, John A.:
—Electric railway industry challenges Loree statement, c809.
Beeuwkes, R.:
—Copper used in electrification of C.M.&St.P. Railway, 1042.
Bianchi, Giuseppe:
—25 years of electric operation in Italy, *1002.
Blue, L. E.:
—Advertising car does missionary work at Muskegon, *549.
Bolt, W. C.:
—"Journal's" analysis of Coffin Prize presentation commended, c76.
Booth, George W.:
—Motorman or locomotive engineer, c76.
Braunig, H. E.:
—Cresoted pine poles, *937.
Brinckerhoff, Henry M.:
—Alternative methods of handling commuter traffic, c450.
Bristol, T. R.:
—Shop practice in overhauling controllers, 411.
Brittain, J. R.:
—Flexible arrangement for welding wheel flanges, *413.
—Four-section tower truck, *256.
Brown, J. L.:
—Chemical mixture removes paint quickly, *292.
Brown, James W.:
—Modernizing old trucks, *104.
Brown, Leon R.:
—Safe methods of operating electric track switches, *105.
Budd, Britton I.:
—Finding the field of the bus, 715.
—Annual Maintenance Number commended, c596.
—Electric railways have entered a new era, 229.
Buffe, F. G.:
—Annual Maintenance Number commended, c596.
Buffe, F. G. (Cont.):
—Complete service includes buses, 717.
—Electric railway industry challenges Loree statement, c809.

C

Capes, William Pau:
—Points on which traction and city officials should agree, 200.
Carbutt, R. F.:
—Committee on management and operation planning big program, c160.
Charters, H. J.:
—New connecting rod reduces track switch failures, *598.
—Portland signal failures still decreasing, *559.
Chenard,O.:
—Dipping and baking are of great value in severe service, 1066.
Ching, C. S.:
—Industrial education as applied to rubber manufacturing, 77.
Clark, A. T.:
—Good maintenance reduces costs, c512.
Coates, Frank R.:
—Annual Maintenance Number commended, c596.
—City traffic and its best servant, 729.
—The industry has kept the faith, 245.
—Traffic control is essential, 852.
Cooke, Harte:
—Effect of Diesel-electric on railroad electrification, 367.

D

Dalgleish, R. H.:
—The renewal parts question, c112.
Dana, Edward:
—Annual Maintenance Number commended, c596.
—Buses supplement rail transportation system in Boston, *757.
Danforth, R. E.:
—Training potential executives in the rank and file, 200.
Dawkins, Frank T.:
—Improving the pull-in record at New Orleans during 1925, 451.
Dean, John S.:
—Bearing life and lubrication of electric railway equipment, 119.
DeLamarter, L. J.:
—Winning public good will, 247.
Demarest, Samuel S.:
—Present-day car painting, 198.
Dewhurst, John A.:
—Co-ordinated lights and rerouting speed up Chicago's Loop traffic, *536.
—8-cent fare granted to P.R.T. by Pennsylvania commission, 157.
—Personnel selected and trained in Milwaukee on scientific basis, *624.
—Texas prosperties are getting results from good merchandising work, *879, *929.
Draper, Walter A.:
—Annual Maintenance Number commended, c682.
Drew, James H.:
—Putting suggestions to work, c724.
Dynes, O. W.:
—Cost of C. M. & P. S. electrification was $22,000,000, c933.

E

Edward, M.:
—Tramway operation progressive in the Witwatersrand, *403.
Emery, James A.:
—Impressions of European tramways, *363.

F

"Fair Play":
—Payroll time not running time, c325.
Foote, F. J.:
—A new use for old tires, *399.
—Gage checks alignment of bus wheels, *890.
Fuller, A. B.:
—Quantity buying for small railways, 893.

G

Garber, Daniel A.:
—Commission plan has two objects, c450.
Gettle, Lewis E.:
—Wisconsin's experience with the indeterminate permit, 980.
Good, Stanley:
—Police officers can do much to improve transportation, 1015.
Goodwin, S. E.:
—Energy saving campaign nets $110,000 in seven years, *799.
Gordon, Charles:
—Better merchandising is bringing results, *827.
—Edwin B. Meissner foresees industry awakening to its opportunity, *427.
—Full speed ahead with expiring franchise, *708.
—Modern cars—not a panacea, but an essential step, 233.
—Samuel M. Curwen sees enlarged market for transportation vehicles, *349.
—Tom Elliott talks on the electric railway outlook, *385.
—Walter J. Cummings says outlook for railways never brighter, *573.
Gottschalk, Otto:
—From log to finished car parts, *113.
Graham, R. N.:
—Experience with interurban railway and bus service, 251.
Graves, Willard F.:
—An opportunity for "Master Mechanic," c289.
Guynes, M.:.
—Design, lubrication and maintenance of railway motor bearings, 121.

Abbreviations: *Illustrated. c Communications.
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

Digitized by Google

H

Harvie, W. J.:
—What type of equipment will attract patronage? 197.
Henderson, D. W.:
—Additional information concerning number of employee in Seattle, c325.
Holden, William W.:
—Annual Maintenance Number commended, c682.
—Detail cost records correct excess expenditures, c724.
Horton, J. O.:
—Fare reduction increases revenue, 243.
Horton, R. H.:
—Co-ordinating the bus with existing transportation facilities, 601.
Hueneryager, A. E.:
—Restrictions in Zion not illegal, c1113.
Hurlock, H. T.:
—Oil handling facilities improved, *1058.

J

Jackon, A. A.:
—Ministry of Transport authorizes 1½d. per passenger-mile, c160.
Jackson, Walter:
—Bus rumors grow as the square of the distance, c597.
—More passengers with higher fare, 975.
—Superiority of straight-line operation, c682.
Jordan, H. E.:
—Detailed cost data are important, c639.
Jorgensen, O. H.:
—Capacity of three baking ovens increased 62 per cent, *501.

K

Katté, E. B.:
—The Diesel locomotive must prove itself, *366.
Kindler, E.:
—Light weight motor cars and trailers for the Berlin Surface Lines, *285.

L

Lee, Colin K.:
—New cars for the Chicago elevated, *182.
Lewis, Harold M.:
—Interstate loop as part of transportation plan for Metropolitan District, c639.
Locke, Dean J.:
—The motor bus in urban transportation, 1021.
Loree, L. F.:
—Electric railway industry challenges Loree statement, c808.
Lovell, Charles G.:
—Rail bond maintenance, *312.

Mc

McKelway, G. H.:
—The electrical department can help reduce noise, *481.
—Third rail insulator maintenance, *113.
McMahon, C. R.:
—Reliable rolling stock must have well-directed maintenance, *483.
MacMurray, G. J.:
—Fiction has nothing on these facts, *7.
Maher, W. F.:
—Control of inventories, 893.
Maltbie, W. H.:
—Depreciation as an operating expense, 354, 399, 542; Comments on, 390.
—Valuation principles in Baltimore case, 69.
Mantell, J. J.:
—All-rail delivery of passengers in Manhattan, c449.
"Master Mechanic":
—Footing the bill for car improvements, c160.
Meyers, E. S.:
—Wide gaging 4,762 ft. of double track in New Orleans, *585.
Miller John A., Jr.:
—Street car operation hampered by unscientific traffic regulation, *580.
—Using the bus to relieve congestion, *813.
—Will interstate loop plan improve commuter transportation? *444.
Murphy, Ernest:
—Destroying a service which cannot be replaced, 198.

N

Nash, L. R.:
—A new local transportation is ahead, 965.
Neild, J. F.:
—Efficient trolley maintenance helps sell rides, *479.

O

Oldfield, Alf. A.:
—Track reconstruction in Sheboygan, Wis., *102.

P

Paterson, A. B.:
—Organizing an equipment engineering department, *497.
Patten, H. C.:
—Budgetary control for electric railways, 1063.
Payne, Harold J.:
—Electric shop truck earns $6,000 a year, *109.
Pforr, Wilhelm:
—Street railways not giving way to buses in Berlin, *c725.
Pinkley, R. H.:
—Economic trend of interurban and bus services, 249.

R

Rasmussen, Nels C.:
—Noise reduction should pay well, c324.
Read, W. T.:
—Are your small tools efficient? c512.
Reid, Harry:
—Annual Maintenance Number commended, c596.
Richardson, G. A.:
—Electric railway industry challenges Loree statement, c809.
Richey, Albert S.:
—Electric railway costs and fares continue stable in 1925, 37.
—Ten-year statistics show gain in electric railway conditions, 281.
Rickcord, R. V.:
—Promotional work as practiced by the Brooklyn Edison Company, 78.
Ritchie, John A.:
—Co-ordination of rail and automotive transportation, 201.
—Interstate bus regulation desirable, 877.
Roberts, A. E.:
—High standard of bearing maintenance gives long gear life, *1051.
Rowe, A. J.:
—A whole convention moved by interurban, *1108.

S

Saunders, B. H.:
—Analysis will stimulate discussion, c449.
Sawtelle, E. S.:
—Reducing gear noise, *184.
—When should pinions and gears be removed for tooth wear, *323.
Scott, Julian M.:
—Modernizing dipping and baking, *675.
See, Pierre V. C.:
—Co-ordinating bus and electric railway car maintenance, *504.
—Five-ton winch truck clears freight truck, *327.
—Great possibilities for improving service through noise reduction, c289.
Segard, Christian P.:
—Improved training for platform men used on Third Avenue System, *1105.
—Internal co-operation, 199.
Shapleigh, A. L.:
—Electric railway industry challenges Loree statement, c808.
Sherion, James F., Jr.:
—Would act as token clearing house, c682.
Smith, A. H.:
—Carhouse remodeled as garage, *186.
Smith, Clinton D.:
—Small roads may create a large market for modern cars, c195.
Smith, R. R.:
—Determination of satisfactory bus fares, 250.
Snyder, D. W., Jr.:
—Electric railway trend is upward and onward, 556
"Spectator":
—Casual observations on the operation of European tramway systems, *147.
Speed, Charles F.:
—Token clearing house needed, c596.
Spratt, J. S.:
—Lacquer painting reduces time needed for drying, 332.
Spurr, A. C.:
—Manufacturers of cars can be more aggressive, c289.
Steiner, Helen E.:
—The utility powder puff versus the utility razor, 252.
Stewart, H. G.:
—Standard traffic signs used in Winnipeg, *756.
Storer, N. W.:
—Some features of the Diesel-electric locomotive, 368.
Storrs, Lucius S.:
—A daily dozen for electric railways, 226.
—Concentrate on the future—There lies opportunity, 554.
—Development of transit in New York City, 644.
Swan, A. W.:
—Improved instrument for car operation tests, *845.

T

Thayer, Edwin F.:
—P.R.T. plans to carry 62,000 an hour at the Sesqui-Centennial, *919.
Thirlwall, J. C.:
—Advantages of electric drive for gasoline buses, 452
Thompson, A. W.:
—Further comment on Annual Maintenance Number, c639.
Tinnon, John B.:
—European rail welding practice, c597.
"Transportation":
—Buses faster than electric cars in New York, c195.

V

Vernon, Bruce:
—New shops built for Fox River line, *841.
Villiers, W. H. C.:
—Standardized overhead for the Canadian National Railways, *759.

W

Walker, D. H.:
—Substantial safety zones constructed in Terre Haute, *319.
—Uniform signboard advertising on main highways, *195.
Wallace, H. U.:
—Further comment on Annual Maintenance Number, c639.
—Track saturation problem in Detroit, 369.
Wheeler, W. C.:
—Improved testing decreases armature open circuits, *834.
—Spray painting used in Chicago, *206.
Wickwire, Edward F.:
—The jollying trolleying public, 203.
Williams, H. S.:
—Car noises from inadequate maintenance demand attention, *476.
—The noise reduction committee's position, c194.
—What type cars does the public want? *669.
Wolff, Ed.:
—Citizen vs. street railway, *761.
Wooton, E.:
—Bus maintenance an important part of the Chicago operation, 333.

Z

Zimmerman, Jesse M.:
—Compensating armature end play, *839.
—Rewinding railway armatures, *315.

Digitized by Google

PERSONAL INDEX

(with biographical notes)

A

Ackerman, M. *268
Adams, E. D. 269
Addison, James *91
Albert, J. E. *269
Allen, Arthur E. 788
Andrews, H. L. *91
Angerer, Victor 826
Arnold, B. W. 528
Atkinson, H. M. *135

B

Bachman, Harold E. 700
Bartlett, C. L. 305
Baskin, Oakley 1129
Baukat, John G. 217
Berceau, H. D. 91, *785
Bertke, W. J. 741
Blair, E. J. *527
Blatz, Warren D. 530
Blunk, Adolf 571
Boehm, F. J. 617
Bohl, Alfred J. 617
Borton, H. E. *1034
Bradford, Herbert E. 469
Brady, D. M. 529
Brennan, T. J. 785
Briar, W. L. 346
Brown, A. V. 617
Brough, Charles H. 268
Buchanan, J. K. 1128
Buker, Edward 426
Burns, E. J. *50
Bush, Arthur R. 270

C

Calvin, Anthony B. 346
Campbell, W. C. *216
Carlton, Williard Gilbert 743
Carnes, J. E. 425, 784
Carpenter, J. W. 1079
Cartwright, D. P. 952
Castle, C. C. *344
Challeen, A. J. *825
Chapin, Frank E. 136
Clark, Walter R. 530
Coen, F. W. 304
Connors, John J. 907
Cornell, F. R. 616
Couch, Harvey C. 826
Cram, Roy C. 217
Crapo, Henry H. *656
Cullen, Charles R. 138
Curtin, M. J. 825

D

Daniels, Fred H. 996
Davison, G. S. 216
Day, Charles 571
Dew, J. R. 1128
Dick, J. P. 216
Dicke, H. F. 528
Duffy, John E. *1129

E

Eales, H. W. 90
Eddy, R. E. *345
Edinger, F. P. 176
Ellingsworth, Ernest B. 90
Elliott, Thomas 425

F

Fariss, E. L. 1034
Federhen, J. A. 1034
Fell, A. L. C. 209
Fernald, Clarence Thayer 868
Fessenden, L. P. 383
Fiske, R. F. 787
Flanigan, M. W. 51
Foltz, C. D. 384
Frank, M. H. *743
Frates, J. A. *617
Frazer, Carl B. 996
Funk, Frank W. 135

G

Gadsden, P. H. 304
Gilchrist, John F. 742
Gillette, C. C. *1128
Gilman, Edgar D. 529
Glenn, Thomas K. 785
Goble, E. V. 136
Godley, Leon G. 742
Goff, David T. 346
Goldberg, Lewis 269
Goldschmidt, Dr. Karl 91
Goodrich, Eliseur S. 996
Gordon, F. D. *700
Gould, Charles A. 176
Gould, H. M. 136
Gregory, T. W. 134
Gregg, Eugene S. 1034
Greig, J. A. *528
Griffin, James P. 996
Griffith, L. H. 51

H

Hallman, J. D. 784
Hamilton, George E. 345
Hammond, John Hays 816
Handshy, C. F. *571
Hanna, John H. *344
Hardin, Harry G. *907
Hart, Frank G. 908
Harte, Charles Rufus *384
Hathaway, E. C. 134
Hauseman, C. B. 616
Hegeman, Harold A. *700
Herdt, Prof. Louis Anthyme 743
Hervey, E. M. 383
Hill, Arthur M. *784
Hines, Earl G. 468
Hodgkins, Walter J. 176
Hood, Ralph D. 136
Horner, F. C. 176
Hubbard, Charles E. 469
Hulswit, Frank T. 468
Huntoon, Edmund J. B. 469
Huntress, Frederick A. 219
Hurt, Joel, Sr. 136

I

Inch, S. R. 175

J

Jeffery, J. G. 742
Jeffries, G. K. *268
Johnston, W. P. 527
Jones, A. W. 136
Jordan, F. A. 996

K

Kelly, W. E. 786
Kennedy, W. H. *345
Knight, D. P. 93
Kretschmer, Edward E. *741
Kuertz, W. Jerome 425

L

Lamar, Robert W. 217
Layng, John F. 996
Lee, Warren K. 953
Lewis, D. K. 616
Lines, W. H. 304
Linforth, F. J. *216
Lockwood, Charles C. 742
Loy, R. L., Jr. 218
Lunda, E. M. 907

M

McClure, D. C. 425
McClure, J. H. 468
McColl, Donald 346
McCune, Joseph C. 469
McGinn, Bernard H. 529
McLimont, A. W. 135, *175
MacCorkle, W. A. 784
Mack, H. L. *825
Maggard, E. H. 951
Maltbie, W. H. *218
Marsh, Alfred H. 951
Mason, Harry C. 270
Mercier, Paul Emile 742
Merrill, E. D. 217
Miller, Carter 346
Millen, Thomas 826
Morgan, Randal 572, 608
Mullett, Howard A. 268
Myers, W. K. 527, *616

N

Nelson, Albert E. 90
Newcomer, C. E. 136
Nicholson, Edward F. *656
Nicholson, J. W. *135
Nicholson, S. L. 305
Noden, R. S. 529
Nougues, Joseph M. 469

O

Odell, Jr., Benjamin B. 868
Ogburn, Charlton 571
Ong, J. R. *383
Overman, W. J. 93

P

Pace, T. J. *699
Paine, Waldo G. 469
Pardoe, E. S. *175
Parham, E. C. 617
Parsons, Frederick N. 219
Peters, W. C. *700
Powell, G. B. *90
Price, Clarence 657
Pryor, Frank J. 743
Pumfrey, Thomas 868, *1079

R

Randall, Frank C. 529
Reynolds, A. L. *134
Richards, Ford A. *383
Rigg, John A. 92
Ritchie, Ralph J. 345
Robertson, W. R. *1034
Rosevear, M. B. *699

S

Sale, C. S. *528
Sawyer, W. H. *90, 268
Schaddelee, Richard 826
Schneider, Edward F. 657
See, Pierre V. C. *468
Seten, W. A. 90
Shannahan, J. N. *304
Shapiro, Alexander 50, 217
Shartel, John W. 701, 1072
Shepherd, William H. 345, *741
Shoemaker, F. C. 176
Smithson, R. A. 657
Sniffin, E. H. *699
Snyder, F. P. *346
Sparks, W. C. 908
Spraggon, Leslie *868
Spreckles, J. D. 1035
Staunton, Frederick M. 218
Stenger, Ernest 217
Stocks, Carl W. 50
Stout, S. H. 616
Sweet, Harrison S. 741
Sweezy, Everett W. *425

T

Tew, C. M. 50
Tulley, H. G. 825

W

Webster, F. W. 784
Weidman, C. O. W. 91
Welsh, G. W. *134
Whaling, T. G. 529
White, R. Allyn 529
Whiteford, William 50
Wilde, Elton S. *656
Williams, B. H. 90
Winans, R. G. *269
Woodin, W. H. *305
Wooler, Ernest 218

Abbreviations: *Illustrated. c Communications.

READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

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Electric Railway Journal

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MORRIS BUCK, *Managing Editor*

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A Year of Steady Progress

JUDGED in a material way, the electric railway industry has had a good year. Preliminary figures indicate that the reduction in riding during the early months was nearly if not quite made up in the summer and fall, so that the total passengers for the year will be little if any less than in 1924. With fares several points higher it is probable that the gross revenues will equal if not exceed those of the banner year of 1923. Operating expenses have changed relatively little, and with economies being practiced the net income for the industry should show a gain.

Faith in the industry is shown by the extensions of track, totaling 340 miles. This is greater than in any previous year since the war. New electrifications were 236 miles, also a record for post-war years. Track reconstruction lagged somewhat, but the total built and rebuilt and electrified was 1,156 miles, which is almost exactly the same as last year's record, which was the greatest since 1915.

SUFFICIENT attention was not paid to replacement of obsolete and worn-out rolling stock. Only 1,659 cars and locomotives were purchased or built during the year as against 4,092 the year before.

The financial situation has been very encouraging. Less difficulty was experienced in refinancing properties that could be regarded as sound investments. The lower requirements due to a smaller volume of maturities in 1926, will make financing materially easier this year. The receivership situation, which was at its worst immediately following the war, is rapidly clearing away. Although thirteen railways went into receivership last year, eighteen were returned to their owners. Two of the largest companies remaining in receivership are practically reorganized, so that they can be expected to resume corporate management early this year.

Most encouraging is the attitude of the railway systems toward the bus. The place of the two modes of transportation is being defined more exactly. Better still, electric railway managements in large number are awake to the necessity of using the bus to round out their systems. New buses to the extent of 2,171 were bought last year by electric railways—well over twice as many as in any previous year, and the companies having bus operation increased 80 per cent. Altogether, 280 companies are now running 5,358 buses.

DURING the year just closed more constructive work has been done with a view to placing the electric railway industry on a sound footing than for many a day past. Leaders of the industry, realizing the need for forward-looking action, have been planning wisely to get a better viewpoint than has existed in the minds of the operators and the public.

Of great significance is the forward move made by the American Electric Railway Association in the formation of the Advisory Council and the appointment of Lucius S. Storrs as managing director. Much work is ahead of him. Alone he cannot accomplish a great deal. He deserves the co-operation and assistance of every electric railway owner, every operator, and every manufacturer serving the industry.

FOR the coming year there is a great deal to be done. Indications are that it will be a good year in regard to revenues and expenditures. This should make it possible to carry forward the plans that have been made for revitalizing the industry so that it may render the greatest of service to the public.

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Stabilized Conditions Should Make for Progress

STABILITY of electric railway operating costs continued throughout last year. Even more than in 1924 the index figures for the industry remained fixed. This is brought out by Professor Richey's article in this week's issue, in which he reviews trends of costs and fares over the past thirteen years. The wholesale price index fluctuated between the limits of 161 and 155.2, or only 3.6 per cent, as compared with 7.9 per cent in 1924. Electric railway construction costs fluctuated still less, or between 205.3 and 200.0, or only 2.6 per cent. Electric railway operating materials costs varied between 150.3 and 158.4, or 5.4 per cent. Wages while high, showed almost no change during the year, going from 221 to 223, or only 0.9 per cent. On the revenue side of the ledger fares were likewise almost stationary, going from 149.6 in January to 151 in October, or 0.9 per cent. However, they receded a trifle to 150.7 in December.

Last year this paper commented on the remarkable stabilization in the index figures as compared with previous years. The fluctuations of 1924 now appear almost violent as compared with those of the year just closed. Last year it was predicted that stabilized conditions would be continued. It was pointed out that the constructive and conservative policy being pursued by the Coolidge administration would make for business stability and hence for similar conditions in the electric railway industry. That prophecy has been fulfilled. With the experience of the past two years there seems to be no reason why it should not be repeated—that present conditions will prevail throughout the present régime.

Conditions such as this should make for progress. Live managements have it in their power to plan with confidence. There is no reason to defer improvements for fear of losing by failure to wait for a more propitious time. What should be done is to adjust operations to the present-day status, and to go ahead without fear for the future.

Record Breaking Bus Developments Mark Progress Toward Co-ordination

EXPANSION of bus service rendered by electric railways broke all records in 1925. While nearly everyone realizes from casual observation that this development has been fast and furious, its true significance is not so readily discernible. Figures show that between Jan. 1, 1924, and Jan. 1, 1925, the number of railway companies operating buses increased about 30 per cent and the number of vehicles slightly more than doubled. During the year just ended the number of railway companies operating buses increased approximately 80 per cent and the number of buses went up almost 120 per cent. New buses ordered in 1925 numbered more than 2,100 as compared with a total gain of some 2,800 in the number owned. Over 3,000 miles of new bus routes were established by the railways, while less than 300 miles of track was abandoned in favor of bus operation.

Careful consideration of the figures presented in the article on bus development published elsewhere in this issue leads to several important conclusions.

1. The increase in the number of vehicles being more rapid than the increase in the number of companies indicates that the experience of the railways operating buses has been satisfactory and that they are extending this type of service.

2. The large number of buses ordered during the year by the railways shows that they are making an energetic effort to provide high class modern transportation facilities.

3. The difference of more than 700 between the net gain for the year in the number of buses owned by electric railways and the number bought from the manufacturers shows that the companies have bought out many competing independents with a view to coordinating rail and bus services. Just how many buses were bought in this way is difficult to determine, but the number is considerably more than 700 because the number of buses junked during the year must be added to the figure mentioned above.

4. The mileage of extensions to bus routes operated by electric railways being more than ten times as great as the railway mileage on which the bus has replaced the car indicates that the existing transportation systems are spreading out to provide service to additional territory.

Encouragement for both the bus and the electric railway is to be found in this situation. Not as competitors but as partners in a joint transportation enterprise they are forging ahead. Co-ordinated service, long believed to be the solution of the transportation problem, made real progress during the past year.

The Public Judges a Railway by the Appearance of Its Cars

CONDITIONS which demand the earnest attention of the entire industry are evident as the result of a survey of the age of electric railway passenger cars. This nation-wide survey, made by ELECTRIC RAILWAY JOURNAL as a feature of this issue, is published on another page. Although mere age alone is of little significance, when viewed in the light of progress that has been made in design and construction over a given period, it becomes a definite index to the condition of the physical equipment. The past fifteen years have brought many fundamental improvements in cars. Previous estimates indicating 25,000 obsolete cars that are in condition to demand rapid replacement are now shown to have been very conservative.

Of much greater importance than seems to be generally accepted are the factors arising from the condition of the cars on a given property. It has been demonstrated on many roads that modern, attractive equipment has a direct effect on the volume of riding. That it helps to maintain regular schedules and to reduce delays and pull-ins is obvious. But it is not so generally recognized that such cars have a direct effect not only on the public's opinion of the railway but also on the morale of platform employees and on their general attitude toward their work. There has also been too little attention given to the reduction in accident hazard made possible by modern cars.

Many examples indicate that the increased earnings and reduced expenses that result from the operation of modern cars of proper design provide an attractive investment basis for financing. Car builders are ready and willing to finance new cars on attractive terms that literally permit them to pay for themselves. One large

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car builder considers equipment trust paper so attractive that he carries it himself as a desirable investment. According to this same builder, no electric railway has ever defaulted on an equipment trust.

In the light of these conditions it is apparent that the industry has been backward in modernizing its equipment. To be sure, it has passed through a most severe period of operating handicaps and restricted credit. But many properties have spent relatively large sums for rebuilding and rehabilitating old, awkward-looking and heavy cars. There has been a tendency to act on the basis that a street car should last forever. Too little attention has been given to the effect of obsolescence on the general standing of the railway in its community. The public has been educated to look for improved design and appearance in transportation vehicles, and in many cities the nondescript and venerable cars suffer by comparison with the modern automobiles. Their appearance has been taken as symbolic of the general condition of the industry.

Much of the popular apathy toward measures for the relief and improvement of electric railway transportation is attributable, in part at least, to the impression of general obsolescence made by the appearance of many cars. The sooner these are replaced and removed from service the quicker will the industry move forward toward that era of renewed prosperity and usefulness which most leaders of thought foresee for the immediate future.

Tendencies in Car Design as Reflected by Statistics

ONE-MAN, two-man cars were bought in greatest quantities during 1925. This evidence of the continued popularity of this type of car is an outstanding feature of the statistics of new rolling stock purchases for last year. For city service one-man, two-man cars constituted 45 per cent of the total of new cars bought, and 14.4 per cent of the interurban cars were of this type. Cars arranged solely for one-man operation amounted to but 11.6 per cent of the total number bought for city service. The number of two-man cars was nearly double that of the one-man type but less than half the one-man, two-man cars.

These figures summarize the relative buying during 1925 of the three types of passenger cars used in surface transportation. The flexibility of the one-man, two-man type which can be operated by one man during off-peak periods and by two men in most congested service meets a long-felt want.

In regard to the size of surface cars, most of the demand was for a car about 44 ft. long and seating 48 passengers. In collecting data for this issue no attempt was made to assemble information as to structural details, but from descriptions of cars published during the year it appears that end entrance and exit cars have been purchased almost entirely. Arch roofs and "T" posts are universally used. Platforms are level with the car floor or with slight ramps and a single step between the roadway and platforms is used. With this type of construction 26 in. diameter wheels became the universal favorite in order to keep step heights to about 16 in.

In general, there have been no radical departures in car design during the last year from that put forward in 1924. Much attention, however, has been given to increasing attractiveness and providing greater comfort.

Large Mileage of Track Extensions Augurs Well for Future of Electric Railways

OPTIMISM for the future of the electric railways is the outstanding impression created by examination of the figures for track extensions made in 1925. New track built during the past year totals nearly 340 miles, more than in any other year since 1917. It would be difficult, indeed, to find more convincing evidence of the important place which the electric railway occupies in the general transportation scheme.

City track extensions were larger than for many years past, as were also the interurban track extensions. This was no sudden spurt to make up for delayed development, as each of the past four years has shown greater track extensions than the preceding twelve-month period. Expenditures for track construction in 1925, however, were not so large as they have been in some other years. This may be explained by the fact that many extensions have been in suburban territory, where the cost of construction is moderate, and also by the fact that part of the paving expense is now being borne by the municipalities.

That the figures for recent years are smaller than those of a decade ago should cause no uneasiness. In those earlier days the electric railway industry was still in a state of development. Today the need for rapid expansion is past, and a steady, healthy growth has taken its place. In fact, we now realize that not all of the expansion of earlier years was necessary or economically justifiable.

But that lesson has been learned. Extensions are not being made nowadays to compete with existing lines, nor to aid in the promotion of real estate ventures. They are made to fill real transportation needs, and only where the volume of traffic promises to justify the expense. Forced by the pressure of post-war high prices to scrutinize every expenditure with the greatest care, the electric railways have never cast off the habit. Yet they deem it worth while to continue building hundreds of miles of new track every year.

Let the pessimists weep at their own prophesies of impending doom for the electric railways. Unwavering confidence in the future on the part of the managements and investors is indicated by their readiness thus to increase the physical plant year after year.

Manufacturers Have Contributed Much to Progress of the Industry in 1925

WELL-GROUNDED satisfaction may be gained from the degree of stability which has marked electric railway equipment prices during the past year. While the general upward trend of economic prosperity has not affected this field directly, due perhaps to the policy of watchful waiting adopted by the operating companies in the matter of additions to equipment, nevertheless the industrial situation, viewed from the standpoint of the manufacturers, is not too somber in aspect.

Practically every business forecast assures a continuation of excellent industrial conditions in general for at least the first half of 1926. Prices are expected to remain fairly stable and there seems little reason to presume any variation from this rule on the part of railway supplies. In fact, it would seem, from the predictions for the current year made elsewhere in this issue by representative manufacturers, that a spirit of

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confidence is shared generally in the ability of the industry to hold its own and slightly improve its purchases.

In the important matter of research and development work on new equipment the manufacturers have been far from idle during 1925. Regardless of the rather sluggish buying which characterized the past twelve months, the producers of railway supplies realized the necessity of further aiding the operating companies through improvements in rolling stock and equipment which would cut down operating costs and attract additional passengers. Hence the large sums annually expended in this direction suffered no material reductions.

It is interesting, in this connection, to note the particular forward strides which representative manufacturers themselves consider as having contributed most of value to the welfare of the industry. Among these were noteworthy reductions in the weights of city and suburban cars, the development of a practically noiseless street car and improvements in the efficiencies of gas-electric buses. Of more general application to transportation problems was the further perfection of oil-electric cars and locomotives.

Electric Railway Expenditures Again on an Even Keel This Year

CONSIDER the fact that the purchasing power of the electric railway industry in the last three years has had a high of $282,000,000 and a low of $262,700,000, a variation of less than 8 per cent. This indicates a most even trend of a business of truly large magnitude. The forecast this year is that $296,150,000 will be spent on new plant and materials for maintenance of existing plant, exclusive of labor. This is nearly 10 per cent greater than the average of the last three years.

Essentially, half of the enormous total will be spent for new construction that will require some form of financing. In recent years this has been a matter of difficulty that has been overcome to some extent through the issue of customer and employee ownership securities or through the aid of car trusts or temporary loans.

The remainder of the budget is that portion of the operating moneys required for the purchase of materials, repair parts and supplies used in the regular maintenance of the cars, tracks, buildings and other structures of the operating companies.

The electric railway industry is indeed one of tremendous proportions. Besides the operating forces necessary to utilize the invested capital and put to work the new money planned for the new year, there is an entire army of men immediately behind the front line ranks in the form of the manufacturers. It is the duty of this group properly to design, manufacture and market the products necessary for operation.

Each phase of these operations is an important element in the successful operation of the railways, and the work of design, manufacture and marketing of the supplies and materials is of as much importance to the purchaser as the market itself is to the manufacturer. This relationship is often lost sight of and is one that calls for the closest co-operation.

Certainly the record of these years and the promise of the new year go a long way to offset the gloom that crops up from time to time, either occasioned by a local company in financial difficulties or perhaps from certain sections of the banking fraternity that have some railway issue thrust back on their shoulders through failure to pay a return on a swollen capitalization.

Proper Balance of Financial Structure Essential

SENTIMENT among bankers toward electric railway securities is distinctly more favorable than it was two years, or even a year, ago. This is reflected in the article elsewhere in this issue. The most glowing sentiments, however, are likely to run to cover under the test of performance. It is not intended by this remark to convey the idea that there is any lack of sincerity in the opinions expressed, but merely to indicate that less fear is felt both among the bankers and the investing public about the future outlook for the electric railways and for the securities based on these properties as a lien. That might at first appear like a Pyrrhic victory, but actually it reflects the sentiment fostered by the many examples of electric railways revitalized in the last few years.

Bankers recognize fully the adverse conditions under which many managements have labored and appreciate the accomplishments in the application of engineering and managerial skill, but they agree with the committee which reported at the Atlantic City convention that the only way out for many properties is by the reorganization of the capital structure. The presentation of this report was one of the most noteworthy events of the year. To many, no doubt, the recommendations contained in it, particularly the one urging voluntary readjustment of finances, came as a shock, but it was a shock that was very much needed. The committee certainly did a business-like job. There is no need to reiterate all the points that the bankers brought out. It does seem advisable, however, to point out again the value of the car trust certificate as a vehicle for the financing of purchases of new equipment. A review of the record of the past shows the high regard in which such securities are held among the bankers, the car builders and the investing public. A great help in this connection will be the successful working out of the plans for interchangeable freight equipment now under way among properties in the Central West.

The talent is available on the operating side to carry on progressively, but an improper, antiquated and rigid financial structure is recognized by the bankers as a greater hindrance than an antiquated engineering structure or plant. In either case the management does not have tools sufficiently flexible and convenient to permit satisfactory operation. To the end that the bankers may be more fully informed about the financial problems of the electric railways the plea is made for co-operation among the members of the American Electric Railway Association in presenting data which would include a balance sheet as of Dec. 31, 1925, with a record of earnings and interest charges for the last five years as an indication of each particular trend and also an estimate of earnings and interest charges for the next five years, and a statement of the probable new capital necessary and the debt maturing within five years.

The time for response to this appeal is at hand. Banker co-operation with the electric railway industry and the constructive work that the bankers may be able to do depend very largely on the extent to which the various companies respond. It is not always true, either financially or otherwise, that he travels farthest who travels alone. The industry is bent upon developing the science of transportation. There can be no adequate development of this kind that does not take fully into account the place that proper financial balance in corporate structure plays in modern business.

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Railways Plan to Spend $296,000,000 for Plant and Material in 1926

Purchasing Power of the Industry Shows Healthy Progress—An Increase of 11.66 per Cent Over Last Year's Figures Is Promised—Large Track Construction Program Is Included in Forecast Submitted by the 57 Operating Companies Furnishing Information

PURCHASES by electric railways for the new year promise to exceed those in 1925 by 11.66 per cent. ELECTRIC RAILWAY JOURNAL'S forecast for 1926 is $296,150,000. This is higher than the estimated actual expenditures for any of the preceding three years and is significant of the outstanding confidence in the permanence of the industry.

This is the fourth forecast of the purchasing power of the electric railway industry made by this paper. In December of each year it sends questionnaires to a number of large companies, in which they are requested to submit confidential figures showing the actual materials expenditures for way and structures, equipment, and power, divided between capital and maintenance accounts. Necessarily, the actual expenditures reported must be based on ten or eleven months of the current year, which, however, is generally quite accurate. The forecast for the coming year is based on the budget figures as actually prepared by those companies making replies to the questionnaire. There is a continual increase in the number of companies making returns. This year there was a total of 57 companies, representing most of the large companies and geographically well distributed over the United States.

An analysis of the accompanying table and charts based on the data contained in this table shows many interesting figures. Of importance is the trend of maintenance expenditures, which have steadily increased for three years and promise a further advance in 1926 equal to an increase over 1923 of nearly 50 per cent.

Expenditures for new plant and equipment in 1925 and the forecast for 1926 do not come up to 1923. The forecast for 1926, however, promises a substantial increase over 1924 and an even greater increase over 1925 of $25,000,000. While the increased use of the bus is responsible for a large part of this promised advance, it is a significant fact that expenditures for way and structures, largely new track, promise a marked upward trend in 1926 of nearly $20,000,000 over 1925.

Segregation of equipment expenditures into rail cars and buses is a new feature in this year's estimate. Expenditures for new buses and accessories by electric railway companies were more than $15,000,000 in 1925, or 23.8 per cent of the total amount spent for equipment.

"ELECTRIC RAILWAY JOURNAL'S" ESTIMATE OF EXPENDITURES OF THE INDUSTRY

New Plant and Equipment

	1922	1923	1924	1925	Forecast 1926
Way and structures	$85,000,000	$74,000,000	$56,000,000	$52,400,000	$72,000,000
Equipment	38,000,000	78,000,000	60,200,000	Rail..50,400,000	45,700,000
				Bus..15,680,000	22,750,000
Power	28,000,000	28,000,000	17,000,000	5,150,000	8,320,000
Total	$151,000,000	$180,000,000	$133,200,000	$123,630,000	$148,770,000

Maintenance Materials and Supplies

Way and structures	$42,000,000	$57,500,000	$56,900,000	$58,950,000
Equipment	44,000,000	54,000,000	Rail..54,700,000	54,000,000
			Bus...7,370,000	11,230,000
Power	16,000,000	18,000,000	22,650,000	23,200,000
Total	$102,000,000	$129,500,000	$141,620,000	$147,380,000

Total of New Plant and Maintenance Materials

Way and structures	$116,000,000	$113,500,000	$109,300,000	$130,950,000
Equipment	122,000,000	114,200,000	Rail.105,100,000	99,700,000
			Bus...23,050,000	33,980,000
Power	44,000,000	35,000,000	27,800,000	31,520,000
Grand total	$282,000,000	$262,700,000	$265,250,000	$296,150,000

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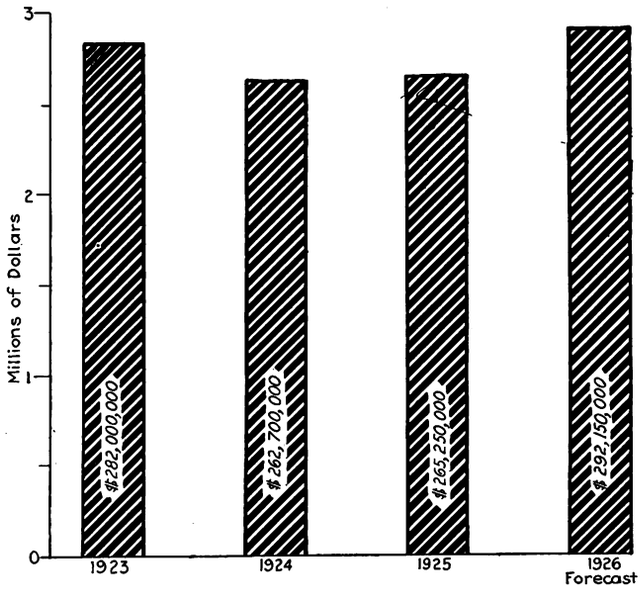
In 1926 the expenditure for buses is estimated at nearly $23,000,000, or 33.2 per cent of the total estimated new equipment purchases in 1926. The combined expenditures for rail cars and buses have thus remained fairly constant for a period of four years, including the 1926 forecast.

Of peculiar interest is the marked upward trend of the estimate for new track expenditures in the 1926 forecast. For the first time in four years the track expenditures have forged ahead of those for equipment. One incentive for increasing line extensions, double-tracking, etc., is undoubtedly the relief of paving charges that many companies have succeeded in obtaining. With the coming of the new year further relief is expected from this antiquated form of taxation.



Total Expenditures for New Plant and Equipment and Maintenance Materials and Supplies

The purchasing power of the electric railway industry for materials and supplies, and new plant and equipment, equals nearly 30 per cent of its billion dollar annual income.

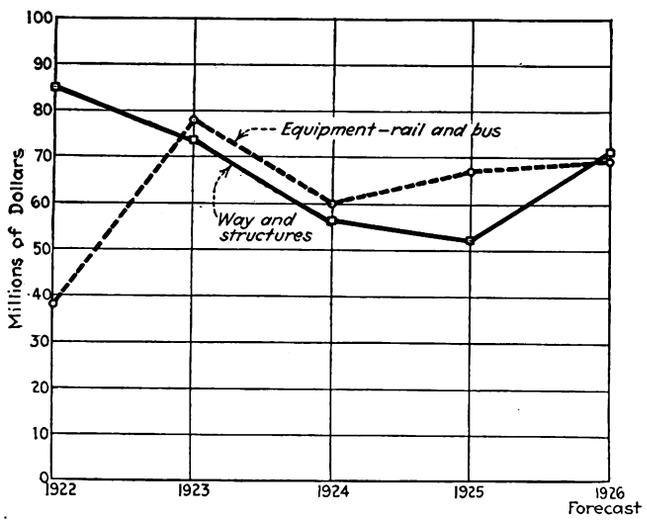
New plant expenditures in the power group show a marked falling off for 1925 and in the forecast for 1926. This is undoubtedly due to the increased use of purchased power as against power generation and denotes generally an economy in operation, although it detracts from this one angle of the purchasing power of the industry.

Without doubt there was an excess of optimism a year ago on the part of the railway companies reporting expenditures and budgets, which were used in making this annual estimate of the purchasing power of the industry. The excessive estimate for new plant and equipment was more than could be expected of a conservative growth. Early in 1925 there was a general recession in business all over the country. This naturally had its effect on the electric railway industry. In the early months of the year passenger traffic was off considerably. While improved business conditions in the summer and fall increased the riding, so that the total revenues for the year will equal those for 1924, the period for starting major improvements had passed. Consequently many companies showed a materially reduced program for extensions and capital expenditures from that they anticipated a year ago.

The estimated purchases of maintenance materials and supplies, however, were exceeded and indicate a tendency to put the house in order and to progress with new projects in an orderly manner.

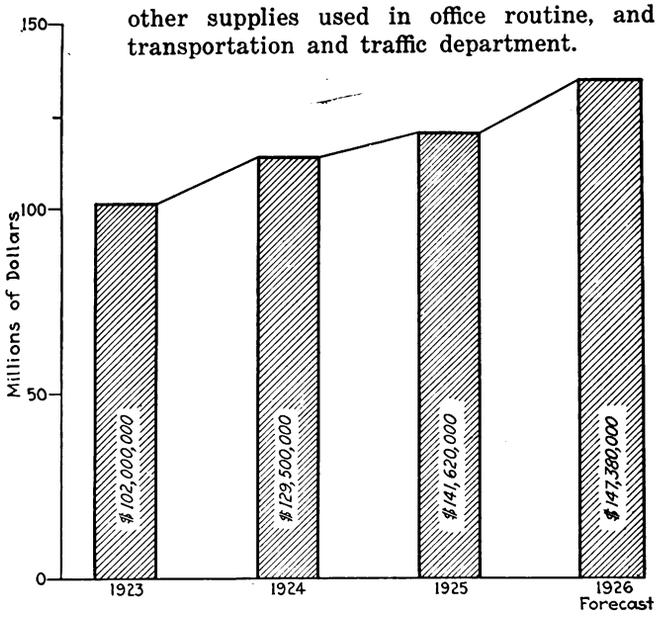
The method of making this forecast by ELECTRIC RAILWAY JOURNAL is similar to that employed in years previous. Essentially the same list of companies was requested to report expenditures for the year 1925 and the budget for the coming year. Some companies replied that they made no budgets, others replied that they weren't ready, and others just didn't reply. A great many of the companies, however, appreciated the importance of the estimate and made careful and prompt returns. Included among these are most of the large companies in all parts of the United States. The totals for the industry are interpolated from the ratio that the track mileage and operating cars of the reporting companies bear to the total of the industry.

These estimates do not include expenditures for new subways and elevated railways that are financed by the cities in which they operate. Likewise this estimate is far less than the actual expenditures for operating the properties as the estimate of maintenance materials and supplies is only for purchases of such materials, and does not include labor or the purchases of other supplies used in office routine, and transportation and traffic department.



New Plant and Equipment

Analysis of purchases for new plant and equipment indicate that expenditures for way and structures will forge ahead of increased rolling stock purchases in 1926.



Maintenance Materials and Supplies

The steady increase in maintenance and rehabilitation expenditures is the greatest indication of the operators' faith in the industry.

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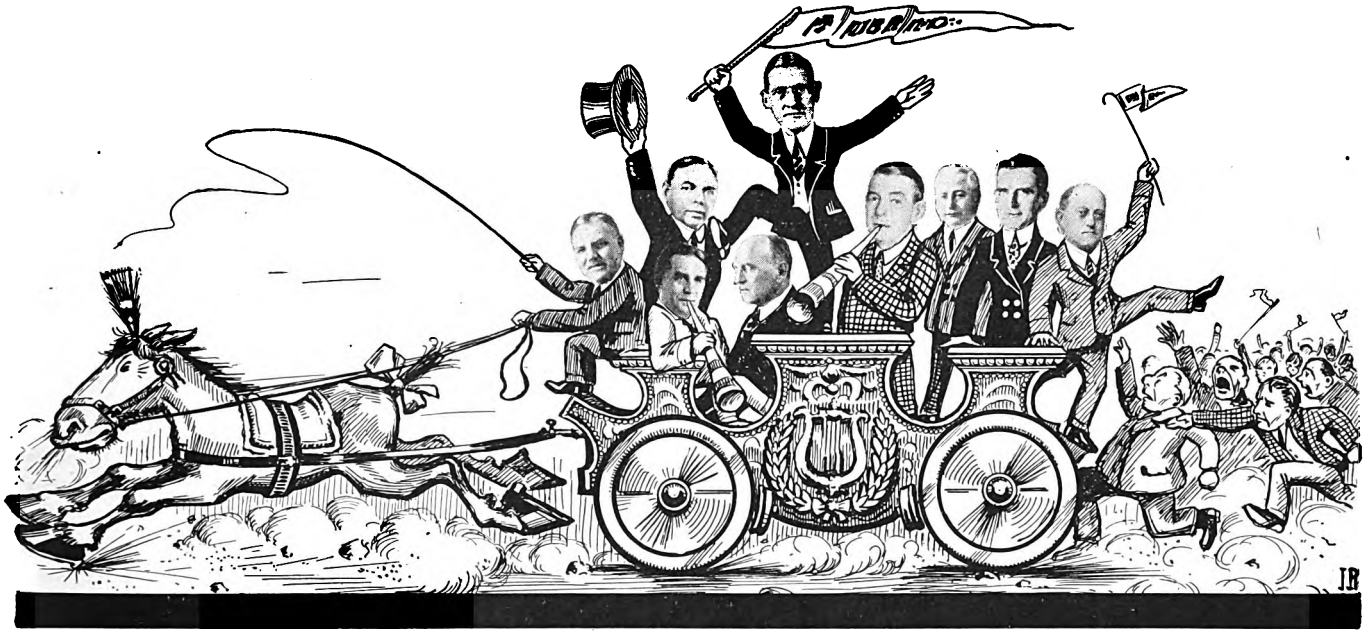

Your Place Is on the Band Wagon Along with the Leaders

Fiction Has Nothing on These Facts!

Suppose You Went to the Door to Answer the Bell and Found a Conductor Instead of a Cop, What Would You Say?—A Science of Transportation Is Being Developed—If You Don't Believe It You Are Out of Touch with the Events of the Industry During 1925

By G. J. MacMurray
News Editor ELECTRIC RAILWAY JOURNAL

SIMEON FORD, the famous wit, said of one of his articles: "If this article, which is meant to be deliciously light and playful, appears to you to be fraught with an underlying varicose vein of gloom, do not hastily pass it by, but remember that it's in the interest of science." That sentence helps a lot. It certainly is a light and playful task to take all the outstanding events of the year in this industry and weave them together into a whole that will be as stimulating as is H. G. Wells' history of the world. But the vicissitudes of journalism are beyond divination. Science must be served. Mr. Wells can, perhaps, afford to be romantic rather then realistic, but I must be realistic in much that I write. All Secretary Welsh's men would call me to account if I treated playfully the statistics of the industry compiled by my good friend Edmund J. Murphy, who registered his *magnum opus* as an orator at the recent convention at Atlantic City.

All the adverse factors considered, there is cheer for nearly everybody in statistics published by the American Electric Railway Association in May which gave operating results on 370 companies, mostly the larger ones. Altogether their operating revenues in 1924 were $786,530,422, or approximately 1 per cent less than in 1923; the operating expenses in 1924 were $581,288,567, or approximately 0.6 per cent less than in 1923, making the 1924 net operating revenue $205,241,855, or approximately 2 per cent less than in 1923. The revenue passengers decreased 1.18 per cent. These figures are neither strident nor cacophonous. They are merely a delicate adumbration of sacred truth achieved by the association's cicerone of statistics. I have no desire to paint the lily or to gild gold. Let us pass on.

FACE TO FACE WITH THE PETRIFIED PAST

Far too often we find ourselves face to face with the petrified traditions of past periods. This is not a new situation in the electric railway industry. Heretofore this matter has been met by doing something drastic, very drastic—like passing a resolution. This year, however, the new Advisory Council, headed by B. C. Cobb, selected Lucius S. Storrs to develop a science of transportation which would result in bringing the members of the family into what Samuel Johnson might have called a consanguine conglobulation. The industry's birthstone might be the grindstone, but it at last came to the same conclusion as the vacuum cleaner, which exclaimed one day as it was pushed over the carpet: "I'm being played for a sucker." In other words the industry was like the man who slipped on a banana peel and executed a funny face, not being hurt, as it turned out, but having his dignity somewhat ruffled. When he recovered a moment later a friend was holding his hat and a number of people had formed a circle.

"What do these idlers want?" he snarled.

"They are not idlers," explained his friend soothingly. "Here's a doctor who wants to look you over,

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a lawyer ready to bring suit for you and a producer of comic films who would like to write you up."

It was something like that with the railways. There they were, all the experts—one saying his traffic arteries were congested, another that his co-ordination was bad.

What the industry needed was not more doctors, but fewer of them. If expert advice were wanted, why not get a man who was an expert? And so it turned to Mr. Storrs. Not until Mr. Storrs had been in office several months did he attempt to prescribe. Then at the meeting of the New York Association he said that the electric railway industry needed to do four things: (1) Modernize equipment, including co-ordination of electric car and bus service; (2) inform the public regarding local transportation facts; (3) obtain greater co-operation among individual utility men for the general good of public service; (4) secure remedial legislation necessary to better service by open and above-board methods.

THE POWER BEHIND THE DRONE

This diagnosis provoked a lot of comment. But the comment of our contemporaries is not always constructive. It often is merely conversation. That's what much of the comment on the Storrs speech was —just conversation. It was like the remark emitted by Pat, in the hospital for observation after an accident. The house surgeon carefully examined the patient, after which he thus stated the case to the nurse:

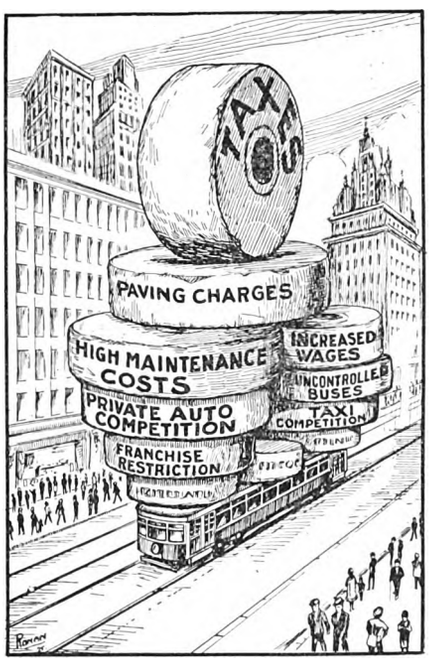
"As subcutaneous abrasion is not observable, I think there is little reason to apprehend tegumental cicatrization of the wound. What do you think yourself?" he asked Pat.

"Sure, doctor," replied Pat, "you're a wonderful thought reader. You took the words out of my mouth."

All of which may make Mr. Storrs the power behind the drone.

And so we enter upon the period of the renaissance of the industry. It is always difficult to fix the limits of any such period. For many companies it began years back, for others it has only lately begun, for still others it remains to begin and for the few it never will begin. These last will become the men of forgotten streets. The direction in which this industry is headed is shown by the material contained in briefs submitted in the contest for the Coffin award, won this year by the Pittsburgh Railways, and by the events of the October convention. A. W. Thompson, president of the Pittsburgh company, said that while many things have made it possible for the company to come within the requirements laid down for the contest, he believed its chief asset has been the successful partnership arrangement with the city for the operation of the trolley service.

Incidentally there never was a convention of the association that reflected so well the general progressive spirit of the industry as did the



The Industry's Birthstone Ought Not to Be the Grindstone

one last October. That isn't apple sauce, either. It led all others in accomplishments, in attendance, in exhibits and in the quality of the presentations by the committees and the various speakers. Freddie Dell, who always insists that things shall be just so, supplied the following final figures.

Year	Convention City	Total Registration at Conventions	Square Feet of Exhibit Space Sold	Number of Manufacturers' Company Members
1921	Atlantic City	1,189	No Exhibit	225
1922	Chicago	4,200	61,895	244
1923	Atlantic City	4,404	75,681	274
1924	Atlantic City	5,804	86,349	330
1925	Atlantic City	7,147	100,030	371

The new president, Frank R. Coates, has a most likable personality and is a capable and progressive operator. Jack Shannahan, his immediate predecessor, made a particularly enviable record. This is all the more to his credit as he succeeded in office a man of very great talent, a prodigious worker and a rescuer of properties for which before his advent there appeared to be little or no hope. Mr. Shannahan, unassuming, unpretentious, took up the work where Mr. Budd left off. The torch was his to hold high. And he did. Largely to him is due the credit both for the formation of the advisory council and the appointment of Mr. Storrs. As for the general work of the association, that story was told at length by John A. Dewhurst in the issue for Dec. 12, page 1029.

In speaking of the convention there is no reason why the lighter side of it should be left out of consideration, just because it was discovered too late to do anything about it that one of the speakers had been vaccinated with a phonograph needle. The girls over at the association office, the Misses Sheridan and Kelly and the sprightly Mrs. Siebrecht, are wearing at work the smocks that were distributed on Carnival Night. In doing this they have set a fashion —created a style. But we are getting away from the point, as the shavings remarked to the pencil sharpener.

DEVELOP THE SCIENCE OF TRANSPORTATION

Don't think that all the good papers and all the good things were said at Atlantic City. It was at the midyear meeting that announcement was made of the real program of the association for the year and that Mr. Storrs had been chosen managing director. You will recall that Owen D. Young said at this meeting that "you have an industry, but perhaps you haven't an art; you have a trade, but perhaps you haven't a science, and I take it, it will be the business of your managing director to develop the science of transportation in your field." There were many notable sectional meetings. At the New York gathering Mr. Storrs laid down his program for the industry. Mr. Shannahan in New England spoke on broadening the work of the association. It was only one of a number of important addresses made by him. D. W. Snyder of the Illinois Traction made a notable address on merchandising transportation last April before the Illinois Association. In June interurban consolidation and

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car design were the topics of the C.E.R.A. summer meeting—always a great event.

Again Mr. Storrs made a cheerful and constructive address. At this meeting of the C.E.R.A. John A. Beeler advanced his suggestion for the consolidation of the interurbans in the Middle West, with the construction of connecting links. Like all of Mr. Beeler's work he made it specific and the presentation entertaining. It was a big idea, this. To a limited extent the suggestion is being achieved by the Insull interests, who have the North Shore, the South Shore and other interurban properties extending as far south as Louisville. Meanwhile don't forget the good work done in rehabilitating the Buffalo & Erie Railway and the very excellent work on the Detroit United!

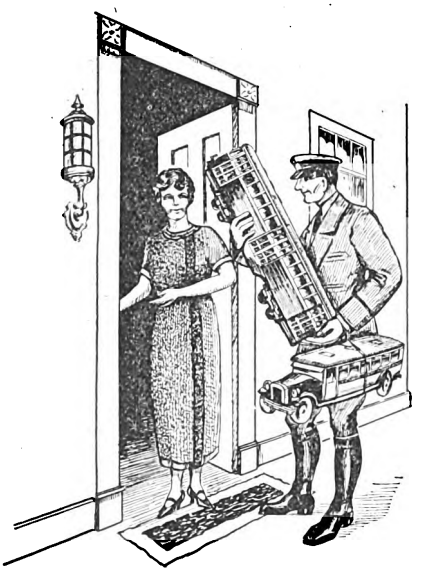
It's a Privilege to Demand Good Transportation

At the C.E.R.A. meeting, too, was the suggestion made by Charlie Gordon about the need for style in car design and the first intimation conveyed to the industry of the extent of the obsolete equipment which is now in service. This need for the installation of new equipment was driven home at Atlantic City and later by Mr. Shannahan in his West Virginia address. Many managers, far too many managers, are endeavoring to merchandise a product of the kind produced in 1900 or earlier. Is it any wonder that the public is reluctant to respond? And you will recall that George Kippenberger, now vice-president of the St. Louis Car Company, said that the car builder had very little choice in the matter. The manufacturer built to specifications. He sensed that in this day and age the passengers wanted something more than just to be handled safely. This is a reflection of the same sentiment to which Pete Witt gave expression at the midyear meeting to the effect that Pullman was the first man to sense the fact that the public wanted better transportation. As James H. McGraw said in "Charting a New Course" in the issue for Sept. 26, "It is a privilege of the people to demand better and better transportation, and for it theirs is the obligation to pay. Our duty is to serve in a manner worthy of our trust."

The extent to which the JOURNAL prints the proceedings shows the regard in which it holds all these efforts to bring out significant facts presented in the papers and in the discussions before national and sectional bodies.

Sir Galahad of Public Service

To borrow a phrase, the electric railway man should be Sir Galahad with public service as his Holy Grail. The equipment means little if its use is not sold intensively. That is just what is being done. Not only is service being advertised, but the street car and the bus are, metaphorically speaking, being taken



Selling the Car and the Bus Just as Other Commodities Are Sold

right into the home. The Toronto Transportation Commission asked its patrons by mail for service suggestions. So did the Key System Transit in Oakland and the Springfield Street Railway, Springfield, Mass. The Pittsburgh Railways sent a Christmas card to a selected list of its customers. In Grand Rapids, where so many progressive things have been done, L. J. DeLamarter organized a campaign in which his trainmen called personally on the ladies of the city with a message from the street car company. Imagine answering the front doorbell and finding a conductor there instead of a cop. Mr. DeLamarter wasn't content with this. He also staged his famous "Don't Worry" campaign. In an editorial early in the year the Philadelphia *Ledger* actually paraded the virtues of Mr. Mitten's motormen and conductors before the public of the City of Brotherly Love. Instance upon instance might be cited of this growing appreciation of the place of the railway in the community.

At the midyear meeting Pete Witt said he had ridden street cars in nineteen cities until he was sore but satisfied. In one of these cities Pete mistook the conductor for the fellow who greases the track. Pete's talk registered, all right, but what of the general transformation now going on? Think of the natty conductors of the Grand Rapids Railway, the Lord Chesterfields on the cars in Denver, the Beau Brummels who work for Bill Sawyer on the lines of the East St. Louis & Suburban Railway, which recently had its third annual clean-up of cars and crews! Forty-six men at East St. Louis received the maximum reward for their spic-and-span appearance; more than 100 others received a $5 bonus.

In Oil City, Pa., cars are being named for local pioneers. The Oklahoma Railway has purchased and fully equipped a model farm near Guthrie. Francis Wilson, one of the receivers of the Kansas City Railways, has been riding on his own cars for five years to learn what the public wants. All of which helps to get the community with you, as Tom Fitzgerald of Pittsburgh said. There the management recognized the truth of Lincoln's words "With public sentiment nothing can fail, and against public sentiment nothing can succeed." Last summer both the Brooklyn City Railroad and the Des Moines City Railway permitted women to smoke on cars. Instance upon instance, each notable in itself, could be piled up here as a record.

They Just Wouldn't Be Licked

Not only in what they are actually doing for the public are many companies setting a dazzling pace, but they are telling the world about it—they are emphasizing their own good points and bringing the good points of their city and their community to the attention of the public. Consider for a moment the little booklet, "A Texas Idea!" Five little utilities down in Texas, the kind that were hardest hit, just refused to be licked. One of them won the Coffin award a year ago, but the work of the others was equally notable. "A Texas Idea" was a classic.

It would of course be impossible to cite all the good advertising that has been done during the year. There is the noteworthy work of Labert St. Clair, effective and available to the entire industry. Guy C. Hecker made the editorial page of the New York *Evening Post* with "Now,

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My Idea Is This." In addition to this there is a vast effort on the part of individual companies. An outstanding instance of this is the work of the Atlanta company. It made a great deal out of the fact that it permitted its patrons to have a voice in choosing the colors of the company's cars. It also did a whale of a job in advertising the new bus service. It just made the people of Atlanta want to ride.

SERVICE MEANS SELLING FREIGHT ON THE INTERURBANS

The most important development in the interurban freight business in the recent past has been the establishment of through rates and joint transportation arrangements, not only between connecting electric lines but also with steam railroads and boat lines. Freight service offered by the average interurban line at the present time is largely confined to the handling of merchandise or package compartments. Little has been done toward the development of straight carload business. A few companies have established a pick-up and delivery business. During 1925 the freight business will return a revenue of about $65,000,000 to the electric railways.

The roads in the small cities are still having a great deal of trouble, but recognition seems to be growing of their essentiality. Witness the recent votes in favor of continuing the railways in Oskaloosa, Lorain, Port Arthur and Whitefish Bay as opposed to the substitution of the bus. The Gary Railway, under Insull management, has made a notable record, as has also the Attleboro Street Railway system, modernized and brought up to date as described by John A. Miller, Jr., in the issue of Aug. 29. Here, too, is the bus being co-ordinated with the railway.

Not all the riding is being done that should be done—or, perhaps, better could be induced, but the record, except in certain individual cases, is a progressive one. The latest United States census shows that in 1922 each inhabitant rode 116 times as the average. In 1890 there were only 32 revenue rides per inhabitant. The number of revenue rides is much greater in the cities. In 1922 they were 257 per capita, an increase from 109 in 1890. The per capita rides in the city of New York have increased from 218 in 1890 to 448 in 1924.

Right here don't forget the good work of the various public relations men and the heads of the State Public Utility Information Bureaus! These fellows, by and large, are doing a whale of a job. Nothing is more important than a public relations policy of the right kind. Public relations work must be done well or it had better be left alone. Altogether too many of these men occupy the rôle of attorney for the defense. Mr. Storrs says that too frequently is it the case that when the company's public relations policy is wrapped up and ready for delivery the public relations men are expected by hocus-pocus methods to have it received with enthusiasm and even with public applause.

Too Frequently the Public Relations Policy Is Wrapped Up Ready for Delivery

GIVE THE STREET CAR A CHANCE

After all, the street car utilizes the surface street area more effectively for passengers carried than any other vehicle. Suggestions made by the committee on traffic congestion of the American Electric Railway Transportation & Traffic Association include abolition of automobile parking at all or specified hours at all points where it seriously interferes with the free movement of car traffic; establishment of one-way streets; establishment of boulevard stops at thoroughfares having car lines; some segregation of traffic; some regulation of pedestrian traffic; abolition of parades along or crossing streets required for heavy essential traffic; some abolition of left turns; establishment of safety zones, where electric cars stop to receive or discharge passengers.

The street cars furnish the low-fare rush-hour universal transfer service. The bus is a different vehicle. It offers a different service, and the price should be in accordance. No paper presented during the year aroused more comment than did that by Fred Buffe, general manager for the receivers of the Kansas City Railways. Reference to his remarks brings up the question of the use of the bus by the railways. JOURNAL figures elsewhere in this issue show that 280 electric railways are using 5,300 buses. In 1921, the records indicate that there were only 16 electric railways operating buses. In too many instances of the union of the railway and the bus it has been a case of miscegenation. The bride married with condescension, hoping that the bridegroom might rise to her level and never for a moment suspecting that hubby was already at her level if not above it.

In 1924 the largest single increase in the number of buses was made by the Public Service Railway, which added more than 500 to its equipment. Second in number of buses acquired during that year was the Northern Ohio Traction & Light Company, and third, the Pacific Electric Railway. Notable additions were made by all of these companies in 1925 and by the Cleveland Railway, the Kansas City Railways, the D. U. R. and at Atlanta. In Philadelphia alone 200 buses operating over seven routes have been put in service by the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company. There is little need to do more than mention Mr. Mitten's purchase of the Philadephia taxis.

Early in the year the Supreme Court held that the regulations which state commissions could exercise over interstate buses was very limited. Previously the Interstate Commerce Commission had declined to exercise control on the ground that it was without authority. As a result, unregulated interstate buses are competing with common carriers, long under governmental control. Action to regulate these buses impends in the bill now before Congress.

The bus as a topic should not be dismissed without mention being made of the notable eleven-page article by Morris Buck and Carl W. Stocks on transit conditions in St. Louis. The authors went over the entire ground, covering competitive opera-

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tions in that city. This was the first time that the full story had been told. It was an unbiased analysis of the present situation in St. Louis and the events that led up to it. Adoption of a standard classification of accounts for bus companies also is of interest.

Low Fares for Short Distances

While the uniform fare with free transfer remains that most generally employed in urban service, there has been a tendency on some lines toward lower fares for the very short distance rider and the very frequent rider. Conspicuous examples of the former practice are in Boston, where the local rider in the suburb pays 6 cents instead of 10 cents, the fare if he uses the rapid transit system; the Public Service Railway of New Jersey, which has 5-cent zones, generally coincident with city boundaries, and San Diego, which has an inner 5-cent zone and an outer 5-cent zone. In general, transfers are not given when only 5 cents is charged. The most conspicuous effort to give fare concessions to the frequent rider is through the unlimited ride weekly or Sunday pass.

Notable Franchise Negotiations

On April 7, by popular vote, Chicago turned down the plan for a unified transportation system. The approximate cost of the entire system was to be $720,902,000. By vote on April 7, Milwaukee rejected a proposed service-at-cost contract between the city and the Milwaukee Electric Railway & Light Company. The most important new franchise adopted during the year was that by the Cincinnati City Council, which was passed and accepted by the Cincinnati Street Railway. It went into effect Nov. 1, 1925. It is of the service-at-cost type, with a fare control fund having a low limit of $200,000 and upper limit of $600,000. As part of this plan the Cincinnati Traction Company passed out of existence and Mr. Schoepf, its head for 25 years, withdrew from his local activities. More than 300 employees who served under Mr Schoepf are carrying watches as a reminder of his largess. The committee of the Massachusetts Legislature on Dec. 15 recommended an extension of the public control act of the Boston Elevated Railway for a period of 30 years. Last May the JOURNAL said: "Mr. Doherty Puts It Up to Toledo." In November Toledo appears to have reversed the process in the Riggs report, although it is not yet clear whose problem it is. Anyway Professor Riggs suggests a new deal there. This report was immediately passed over by the Council without comment to its committee on railroads and telegraphs, with which body it now reposes.

The large number of automobiles on the street has greatly increased the problem of accident prevention.

Striking Portrayal by Cartoonist of Philadelphia "Record" of Willingness of Mr. Mitten to Turn All Forms of Transportation to His Own Advantage

While accidents which occur in boarding and alighting and from causes other than in connection with automobiles have decreased, those in which automobiles are involved have in many places increased. In consequence, a number of companies have embarked in extensive safety campaigns by the education of their employees and pleas to motorists to help prevent accidents. With the employees, competitions between divisions have been arranged that are intended to promote the best safety results. The co-operation of the public has been solicited in many ways, as through encouragement in the organization of local safety councils and safety campaigns.

As a further inducement to employees to make good safety records 31 electric railways in the United States now use bonus plans of one kind or another. Railways have much to gain from the results of the conference on street and highway safety, initiated by Secretary Hoover. One of the latest announcements made is that the Louisville Railway is prepared to offer substantial cash awards for safety work and to send the most successful candidate among its employees to the convention of the American Electric Railway Association.

In New York Barron Collier conceived and carried out an elaborate safety parade with the hope of bringing home to the public the message of safety. In this parade memories were revived of the days of the horse car and the hoop skirt in several of the floats. These days of long ago were also revived to the residents of Paducah, El Paso and Salt Lake City by parades held in these cities, but the demonstrations were not made in connection with safety work.

Chicago has been studying the feasibility of subways for thirteen years and has spent $821,459 in surveys and reports—and not a spadeful of earth turned yet. Activities of the Detroit Rapid Transit Commission during the first few months of 1925 were directed largely toward securing from the state legislature

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authority to permit the city to proceed with the rapid transit system such as the city may elect. Los Angeles opened a short rapid transit line on Dec. 1. Much talk is heard about subway digging in smaller cities, but usually the economic obstacles to creating a self-supporting system in such cases appear to be nearly insurmountable. Perhaps the two most notable traffic surveys of the year were those by Mr. Beeler in Atlanta and by McClellan & Junkersfeld in Washington.

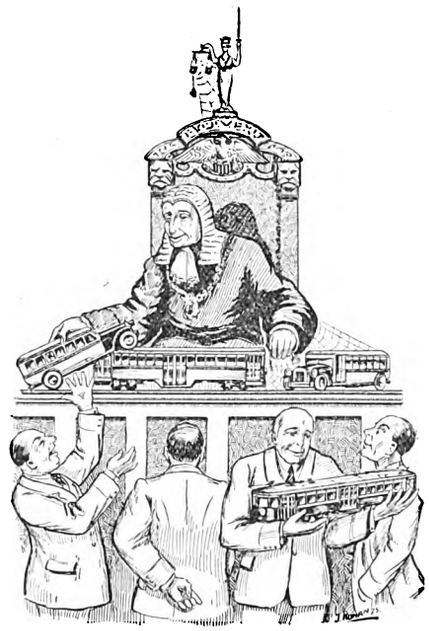
Manufacturer co-operation has always been given willingly in the electric railway industry. This is especially true at the present time. One of the notable contributions during the year was the study made by Victor Angerer, vice-president of William Wharton, Jr., & Company. On his own account Mr. Angerer made a survey of the industry, the result of which he later permitted to be made available to the industry through a comprehensive article published in the JOURNAL for April 4, page 533. There was the usual Wickwire contribution at the Atlantic City convention. Also on that occasion Charlie Peirce came out of hiding as a speechmaker and made impromptu at a Transportation & Traffic Association session one of the best talks of the whole meeting.

Mr. Peirce knows a lot about the business. He ought to. He has been in the selling end for 35 years. He didn't come to pose as an expert—a plain ordinary man away from home. Not only did he agree with Mr. Queeney about taxicabs in Philadelphia, but he would even supply the public roller skates if they wanted them. His idea was to get the gross up and then take care of it. He had no sympathy with cheeseparing. A salesman all his life, Mr. Peirce defied any man to continue selling anything, transportation not excluded, that was not made attractive.

SOME SIGNIFICANT LEAVE-TAKINGS

In the political arena there were a number of significant leave-takings. New York took leave of Mayor Hylan. He was eliminated in the primaries following the condemnatory report presented by Governor Smith's special commissioner who placed the seven-year delay in subway work at the Mayor's door. In this report the New York Transit Commission was exonerated. James F. Jackson, chairman of the board of trustees of the Boston Elevated Railway, resigned, due, as the *Transcript* put it, to "the summary treatment of the trustees by the Governor in his statement threatening them with discharge if they 'permitted' a strike of the car men." In the stand that he took Governor Fuller virtually reversed the policy of the trustees. Later the Governor reversed his stand.

Out in Detroit Mayor Smith paid his political respects to Ross Schram, manager of the Detroit Municipal Railway, by instructing the local Street Railway Commission to dismiss Mr. Schram and to remove I. N. Merritt as auditor. Mr. Wilcox resigned about the same time as claims attorney for the railway.



Belated Justice in New Haven Case—Much Too Often Scales Are on the Eyes of Justice Instead of in Her Hands

Speaking of the municipal systems the city of San Francisco rejected at the recent election the purchase proposal under which the Market Street Railway would have been taken over. Incidentally, the San Francisco Municipal Railway was operated at a loss of $295,230 for the year ended June 30, 1924, the latest official figure available. The excess of income over operating expenses and reserves actually was $8,374, but this figure took no account of taxes and similar items amounting to $303,604. This is a commentary on the inadequacy of the 5-cent fare. On the other hand, Seattle piled up a profit of $557,243 for the year 1924 compared with $169,636 in 1923. This was done under the 10-cent cash fare with three tokens for 25 cents, a rate reached after experimenting.

The politicians, led by Mayor Schwab of Buffalo, have certainly kept Mitten Management from attaining the rehabilitation of that property. Little attention was paid locally to warnings about the inadvisability of allowing a 5-cent bus company to compete with the International until a disinterested committee reported adversely on the proposition. The politicians of St. Paul and Minneapolis have finally seen the light and have entered into an arrangement with the railway for a settlement that could have been effected just as easily at the inception of the controversy had the men elected locally to public office assumed a different attitude. Because public authorities kept their eyes on political expediency and not on economic needs a decree was entered in 1914 requiring the New Haven Railroad to sell its New England trolleys. These now go back to that property under the decree of Judge Winslow rendered on Nov. 21. Meanwhile, however, the Rhode Island lines passed into the hands of a receiver and so are lost to the New Haven at a cost of many millions of dollars and no benefit to the public. In Pennsylvania the Supreme Court overruled the removal of Public Service Commissioners Benn and Shelby, summarily dismissed by Governor Pinchot last August during the progress of the Philadelphia Rapid Transit fare hearing. Much too often, however, scales are on the eyes of Justice instead of in her hands.

During the year the courts and commissions upheld the use of one-man cars in Buffalo, Milwaukee, Dayton, Worcester, New Haven and Nashville. Public Service Railway of New Jersey is now operating practically 100 per cent with one-man cars.

And so this desultory account has run on to the extent of six pages. But Montaigne very aptly said that "the world is nothing but babbling and words," after which he himself went babbling. Remember that the great Burke, frightened by the thunders of change all about him, turned back to the past, while Thomas Paine, thrilled by the same thunders, saw a dawn and proclaimed a hopeful future. The harder the conflict the more glorious the triumph. A better outlook depends in a large measure on a better lookout. When it puts away discouraging prophets this business will put away encouraging profits.

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Issues of Merit Easy to Sell

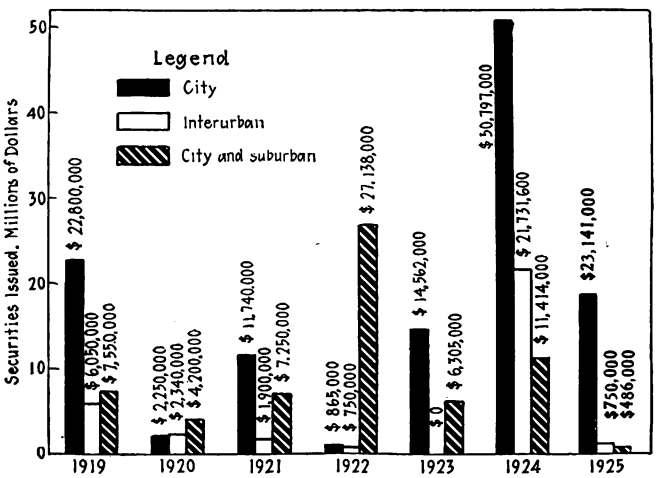
Total of Financing in 1925 Not Large Compared with Recent Years, but Companies with Good Operating Records Experienced No Difficulty in Finding a Market for Their Issues at Reasonable Rates—Need Is Imperative for Recasting Many Financial Structures

HOUSES of issue which in recent years have sold electric railway bonds to the public report that issues of real merit are much easier to sell to the public than were similar issues two years ago. Unfavorable sentiment which existed for a long time is no longer as evident as it was. This is attributed to the general improvement in the railway situation, but more particularly to the eradication from the mind of the public that the bus is destined to replace the railway. This change in sentiment is due to the publicity that has attended the willingness of the railways to turn the bus to their own advantage.

In this connection investment bankers point out that the situation in the electric railway industry as regards competition and changes in the fundamental aspects of the business have not been very different from similar conditions with which industrials have had to contend. There is, however, this notable exception, namely, that the industrials are not subject to the service restrictions which have been placed on the railways with respect to the conditions under which the two function. The railway that has found a solution of the bus problem is, of course, in a much better position to do its financing on better terms than is the company which has not solved that problem. In fact, new financing is approached by the banker on the basis of such solution having been found.

Over and over again bankers referred to the report of the advisory committee on electric railway finance, presented at the convention of the American Electric Railway Association, as stating concretely their attitude toward the whole problem. As they see it, the problem is one in which a proper balance must be struck among the engineering, operating and financial sides of the business. It is notorious that most electric railways are badly financed as regards the proportion of the bonded debt to the fair value of the property. The feeling of the bankers is that until the recent report was presented at Atlantic City nobody had suggested any remedy for the railways except more business. More business is highly desirable, but it is realized by the bankers that no amount of merchandising or skill in operation will correct a financial situation that is inherently unsound.

The thing to do is to clean house. This seems at first severe, but is it? Eventually the situation becomes untenable. It becomes untenable because the cost of new money exceeds the return on it that can be earned. Money costs vary with the hazard that is involved. Thus to a company that is earning its interest twice the cost would be 6 per cent. With a lower earning ratio the cost goes up on a constantly increasing scale to the point where it would be 10 per cent if interest were earned only 1.20 to 1.35 times. In other words, as the bankers point out and as the committee has emphasized, where a company is earning only a small margin over fixed charges, three important factors militate against it:



Securities Issued Have Varied Widely from Year to Year as the Demands Have Changed

1. Where money can be raised at all for necessary capital expenditures, it can usually be done only at a cost greater than the return the money is likely to earn.

2. Where the operation is a refunding one, the new obligations, not even considering the general state of

Details of New Bond and Note Financing in Amounts of More than $200,000 Offered Publicly During 1925

Issue	Price	Maturity	Yield	Amount
JANUARY				
Brooklyn City Railroad-Equipment Trust Certificates	.....	1926-35	4.50-5.50	$3,750,000
Chicago, Aurora & Elgin Railroad 2-year 6½ notes	100 and interest	1927	6½	750,000
Reading Transit Company first and refunding gold Series A 6's	98 and interest	1954	6.15	1,250,000
FEBRUARY				
Eastern Mass. St. Railway Refunding Mortgage Series A 4½	.....	....	7.0	(block)
Worcester Consolidated Street Ry. 1st and refunding gold 4½'s	.....	....	....	2,116,000
MARCH				
Philadelphia Rapid Transit gold 6's	99 and interest	1962	6.06	8,975,000
JUNE				
Norfolk & Portsmouth Traction First Mortgage 5's	98½ and interest	....	....	486,000
AUGUST				
Gary Railways First Refunding 6½'s	96 and interest	1945	6.75	550,000
OCTOBER				
Cincinnati Street Railway 1st 6's	100 and interest	1928	6.00	4,500,000
DECEMBER				
Chicago Rapid Transit Company first and refunding mortgage 6½'s	95 and interest	1944	6.98	2,000,000
Total				$24,877,000

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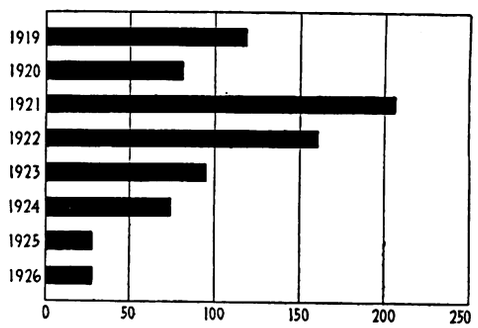
the money market, will bear a higher rate than did the one maturing.

3. Companies in either of these positions, even if they are able to borrow on a mortgage, will not be able to raise any new capital by the sale of stock.

There is no blinking the facts. There has been considerable financing of electric railways during the last five years on terms that were very favorable to the borrowers, but these instances were by companies strategically situated with favorable records of earnings in the past and under management known the country over for its progressive attitude. For the others the only way out, except at terms in themselves prohibitive, is by revamping the capital structure. The bankers have said quite definitely that an improper, antiquated and rigid financial structure is usually a greater hindrance than an antiquated engineering structure or plant. In either case the management does not have at hand tools sufficiently flexible and convenient to permit satisfactory operation.

It has been said before that a situation similar to that in the electric railway field has existed in other industries. It has. Witness the high rates paid only a few years ago by industrials with good credit ratings for the new money they needed. Because of their strategic earning position, however, many of these companies have refunded the issues so put out, paid some of them in part or paid them in full. The very nature of the utility business does not permit a surplus to accrue that makes it possible to retire issues either in part or in full out of earnings. There is all the more need for some managements resolutely to face the facts and to put their financial houses in order. Voluntary readjustment is never easy to accomplish. The recent case of the Detroit United Railway is an instance in point. That road appears to be working out its own salvation under receivership, but the stockholders with the prospects before them of an assessment of more than $30 a share to protect an equity appraised market-wise at $4 a share did not consent to the levy in numbers sufficient to keep the property in their own hands.



Maturities in This Year Are Less Than at Any Time Since the War

So far as the maturities for the new year go, they total $26,644,790 compared with $28,224,000 in 1925. Incidentally this table of maturities indicates the rates at which financing was done 25 or 30 years ago under favorable economic conditions, with paving and franchise terms not then onerous and with wages averaging about 21 cents an hour compared with about 65 cents now. The contrast is a striking one. As for the amount of bonds now in default the total of about $200,000,000 appears to be imposing, but it is not so when the conditions of the last few years are considered and the figure is weighed in the light of the total of $6,000,000,000 invested in the industry. Even allowing for the roads that have come out of receivership recently the list shows strikingly the type of road hit hardest.

In one respect banking opinion appears to be divided. That is on the equipment trust. It is agreed that so far as freight equipment is concerned the ability of the companies to borrow against such equipment would be helped materially by standardization of design such as

Seven-Year Record of New Electric Railway Financing Involving Bond or Note Issues of More than $500,000

	City Railway	Interurban	City and Suburban
1919	$22,800,000	$6,050,000	$7,550,000
1920	2,250,000	2,340,000	4,200,000
1921	11,740,000	1,900,000	7,250,000
1922	865,000	750,000	27,138,000
1923	14,562,000	.....	6,305,000
1924	50,797,000	21,731,600	11,414,000
1925	23,141,000	750,000	486,000

Comparison of Maturities in the Electric Railway Field

1926	$26,644,790	1922	$160,015,860
1925	28,224,000	1921	207,617,530
1924	73,051,600	1920	80,466,100
1923	94,851,800	1919	116,785,500

Principal Electric Railway Maturities in 1926 Based on Dow, Jones & Company's Compilation

	Rate	Amount
January		
Niagara Falls & Suspension Bridge Railway, 1st	6	$488,000
Interborough Rapid Transit Company, equipment trusts, B	6½	450,000
Eastern Massachusetts Street Railway serial	6	300,000
Lowell & Fitchburg Street Railway 1st	5	275,000
Oklahoma Railway junior mortgage	6	260,000
Brooklyn City Railroad equipment trusts A	5	375,000
		$2,148,000
February		
Peoria Railway refunding	5	$1,754,000
Detroit, Ypsilanti, Ann Arbor & Toledo Ry. consolidated	5	1,610,000
Detroit, Ypsilanti & Ann Arbor Railway, consolidated	6	330,000
Fitchburg & Leominster Street Railway consolidated	7	300,000
Philadelphia Rapid Transit Company, equipment trust G	5½	237,500
Pittsburgh Railways car trust	6	200,000
Western Massachusetts Street Railway 1st	5	200,000
		$4,631,000
March		
Interborough Rapid Transit Company equipment trust, A	6	$280,000
Clinton Street Railway 1st	5	400,000
		$680,000
April		
Kankakee Electric Railway 1st	6	$200,000
Rockville, Broad Brook & Eastern Windsor Railway	5	200,000
		$400,000
May		
Indiana, Columbus & Eastern Traction refunding	5	$6,400,000
North Hudson County Railway ext	6	1,291,000
West Philadelphia Passenger Railway 2nd	5	750,000
Wheeling & Western 1st	5	235,000
		$8,676,000
June		
Roxboro, Chestnut Hill & Norris Railway	5	$371,000
Detroit & Pontiac Railway consolidated	4½	362,000
Shawnee-Tecumseh Traction 1st	5	300,000
Goff Falls, Litchfield & Hudson Railway 1st	5	200,000
Frostburg, Eekenington & Cumberland 1st	5	230,000
Lonaconing, Midland & Frostburg Railway	5	200,000
		$1,663,000
July		
Grand Rapids, Grand Haven & Muskegon 1st	5	$1,500,000
Brunswick Traction gold	5	500,000
		$2,000,000
August		
Brownsville Avenue Street Railway, (Pittsburgh), 1st	5	$300,000
Philadelphia Rapid Transit equipment trust G	5½	237,500
Worcester & Blackstone Valley Railway	4½	200,000
		$737,500
September		
None		
October		
United Railways, St. Louis, receiver's certificates	6	$4,200,000
		$4,200,000
November		
Interborough Rapid Transit equipment trust C	6	$570,000
		$570,000
December		
Chicago, Aurora & Elgin Railroad two year	6½	$750,000
Philadelphia Rapid Transit equipment trust H	5½	759,290
		$1,509,290
Total of all public utilities:		
1926		$26,644,790
1925		$28,224,00

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is now being attempted by the roads in the Central West, but some bankers do not hold to the same views about passenger equipment. The definite position is taken by one of the largest houses of original issue that the ability of the management, the record of earnings of the past, the political situation and the degree of co-ordination of bus and trolley service would be the sole basis upon which it would judge a proposal to sell equipment trust obligations to the public. Of course, it would not stand sponsor for an issue of bonds secured by a type of car that might be considered a freak, but the type of car would be incidental to the other factors. On the other hand, other houses of issue while weighing all the points previously mentioned would be guided to a very large extent by the suitability of the equipment for use in an emergency in a city other than the one for which it was originally intended. There is no need here to stress the favor with which steam railroad equipment trust obligations are regarded. The fields differ greatly in extent, but it is generally felt that the electric railways have much to learn from the steam railroads in this respect.

Lastly it is of interest to note the extent of the recognition received by the report of the advisory committee on electric railway finance. Not in just the words of the committee, but over and over again representatives of banking houses gave expression in their own words to the opinion so ably expressed by the committee in its report to the effect that there are too many examples of electric railway properties which have been revitalized by new managements and new technical equipment, by recasting financial structures, and by modernized methods of salesmanship, for anyone to conclude in any way other than that the electric railway industry is fundamental and that its troubles have been the result of a combination of unprecedented and uncontrollable economic factors. Bankers expect that the financial problem, in those cases where it is a problem, will be attacked with the courage with which the other railway problems are now being attacked.

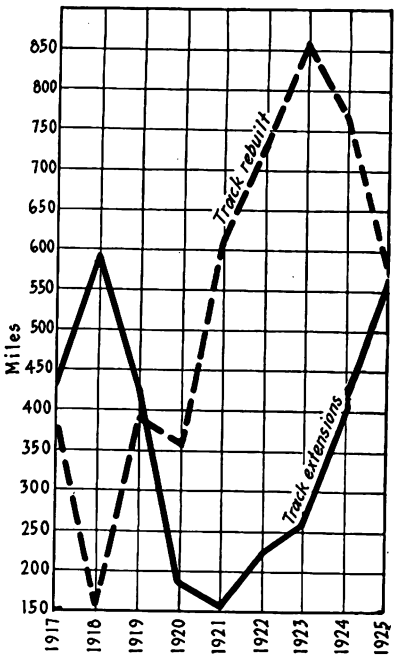
Track Extensions Show Substantial Gain Over Previous Years

Electric Railway Mileage Added During Past Twelve Months Is Larger than in Any Other Year Since 1918—Extensions to City and Interurban Trackage Show Increases Over 1924 — More than Twice as Much Steam Railroad Mileage Was Electrified

FOR the fourth successive time, the mileage of new electric railway track added during the year exceeded that of the preceding twelve-month period. New track added during 1925 was approximately 340 miles. Extensions to city trackage amounted to a little more than 225 miles, a gain over 1924 and the largest figure since 1917. Interurban extensions totaled about 112 miles, a substantial increase over the preceding year and also the largest figure since 1917. Electrification of steam railroad lines, amounting to somewhat over 230 miles, was more than double that of the year before. Thus the total of all extensions was approximately 580 miles, or more than for any other year since 1918.

Most notable were the extensions to city track mileage in the Central, Southern, and Western states, each of which group added more urban trackage in 1925 than in the previous year. The Central and Southern groups also added more interurban mileage during the past twelve months than they did the year before. In the Western group, however, the new interurban mileage was less than in 1924. Extensions in the New England and Eastern states and in Canada totaled somewhat less for 1925 than for the preceding year.

The largest single extension made during the year was an addition of 56 miles to the interurban trackage of the Chicago, North Shore & Milwaukee Railroad, involving the construction of the Waukegan cut-off. Plans for this undertaking were described in considerable detail in the issue of ELECTRIC RAILWAY JOURNAL for July 26, 1924.



Mileage of Track Extensions and Reconstruction Since 1917

Electrification of steam railroad lines was carried out by five companies. In point of mileage the largest enterprise of this kind was that of the Staten Island Rapid Transit Company, a subsidiary of the Baltimore & Ohio Railroad, approximately 56 single-track miles being changed over to electric operation. The Babylon

Summary of Track Construction for 1925

	New England States	Eastern States	Central States	Southern States	Western States	Canada	Grand Total
Track Extensions							
No. of companies....	6	17	30	11	26	10	103
Miles of urban track	4.554	27.265	72.705	24.006	52.111	46.671	227.312
Miles of interurban track.....	0.559	8.906	64.449	12.527	22.862	3.180	112.483
Total miles built.	5.113	36.171	137.154	36.533	74.973	49.851	339.795
Track Reconstruction							
No. of companies...	15	44	61	17	27	15	179
Miles of urban track	54.861	149.925	155.646	34.504	65.210	25.600	485.746
Miles of interurban track.....	23.165	27.978	26.916	1.000	11.126	2.970	93.155
Total miles rebuilt	78.026	177.903	182.562	35.504	76.336	27.480	578.901

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Track Built and Rebuilt During 1925

Name of Company	Extension Miles City	Extension Miles Interurban	Rebuilt Miles City	Rebuilt Miles Interurban
Connecticut				
Connecticut Co.	1.694	0.126	11.167	2.831
Maine				
Bangor Railway & Electric Co.	.....	.....	0.920	.....
Biddeford & Saco Railroad	.....	.....	.....	0.500
Cumberland County Pr. & Lt. Co.	.....	.....	1.858	.....
York Utilities Co.	.....	.....	0.663	0.757
Massachusetts				
Berkshire St. Ry.	.....	.....	0.725	1.604
Boston Elevated Railway	0.700	.....	11.500	.....
Eastern Massachusetts St. Ry.	0.330	.....	8.000	3.264
Middlesex & Boston St. Ry.	.....	.....	5.000	.....
New Bedford & Onset St. Ry.	.....	.....	.....	1.150
Springfield St. Ry.	0.195	0.263	3.428	2.899
Union St. Ry., New Bedford	.....	.....	1.000	6.000
Worcester Consolidated St. Ry.	.....	.....	0.500	1.600
Rhode Island				
Newport Elec. Corp.	0.095	.....	.....	.....
United Electric Rys., Providence	1.540	0.170	8.100	2.560
Vermont				
Springfield Terminal Ry.	.....	.....	2.000	.....
Total	4.554	0.559	54.861	23.165
District of Columbia				
Capital Traction Co.	.....	.....	1.205	.....
Washington Ry. & Elec. Co.	.....	.....	7.580	.....
Washington-Virginia Ry.	.....	.....	0.340	.....
Maryland				
Potomac Edison Co.	0.550	.....	0.417	.....
United Rys. & El. Co.	.....	.....	17.000	.....
New Jersey				
Central Passenger Ry.	.....	.....	1.000	.....
Morris County Trac. Co.	.....	.....	2.272	.....
Ocean City Elec. R.R.	.....	.....	1.117	.....
Trenton & Mercer Cty Trac. Corp.	0.390	.....	0.570	0.960
Trenton-Princeton Traction Co.	.....	.....	0.500	.....
New York				
Binghamton Ry.	.....	.....	.....	1.430
Brooklyn City R.R.	.....	.....	9.685	.....
Brooklyn-Manhattan Trans. Corp.	1.153	.....	13.115	.....
Elmira Water, Lt. & R.R.	.....	.....	0.333	.....
Empire State R.R.	.....	.....	0.680	.....
Fonda, Johnstown & Gloversville R.R.	.....	.....	0.300	.....
Hamburg Ry.	.....	.....	1.500	0.600
Interborough Rapid Transit Co.	4.210	.....	.....	.....
International Ry.	0.250	0.440	0.230	.....
Jamestown St. Ry.	.....	.....	1.500	.....
New York & Queens County Ry.	9.000	.....	.....	.....
New York State Rys.	0.190	.....	9.020	.....
Rochester & Syracuse R.R.	.....	.....	0.370	.....
Schenectady Ry.	0.350	.....	2.250	.....
Southern New York Ry.	.....	.....	.....	1.000
United Traction Co., Albany	.....	.....	1.795	.....
Pennsylvania				
Allegheny Valley St. Ry.	.....	.....	.....	0.178
Altoona & Logan Val. Elec. Ry.	.....	.....	2.610	.....
Beaver Valley Traction	.....	.....	1.326	.....
Buffalo & Erie Ry.	.....	.....	0.060	.....
Erie Rys.	.....	.....	0.511	.....
Harrisburg Rys.	.....	.....	1.170	.....
Hershey Transit Co.	1.400	.....	.....	.....
Lehigh Traction Co.	.....	.....	0.795	.....
Lehigh Valley Transit Co.	.....	5.880	4.700	0.590
Meyersdale El. Lt., Ht. & Pr. Co.	.....	0.500	1.000	6.500
Oley Valley Ry.	.....	.....	.....	1.500
Philadelphia Rapid Transit Co.	2.297	0.212	26.085	.....
Pittsburgh Rys.	5.225	0.317	20.527	3.290
Reading Transit Co.	2.200	0.600	5.900	2.000
Schuylkill Ry.	.....	.....	4.000	2.000
Scranton Ry.	.....	.....	3.610	3.020
Webster, M., B. V. & F. C. St. Ry.	.....	.....	2.000	.....
West Penn Rys.	.....	0.407	.....	4.910
York Rys.	0.050	.....	0.352	.....
Virginia				
Roanoke Ry. & Elec Co.	.....	0.550	.....	.....
West Virginia				
Princeton Power Co.	.....	.....	1.00	.....
Wheeling Public Service Co.	.....	.....	1.500	.....
Total	27.265	8.906	149.925 [x]	27.978
Illinois				
Alton Granite & St. Louis Trac. Co.	.....	.....	0.256	.....
Chicago North Shore & Milwaukee R.R.	0.208	56.683	.....	3.258
Chicago Rapid Transit Co.	10.130	.....	7.800	.....
Chicago Surface Lines	3.670	.....	10.100	.....
Chicago & Joliet Elec. Ry.	.....	.....	0.750	0.300
Chicago & West Towns Ry.	.....	.....	2.092	.....
East St. Louis Ry.	0.284	.....	0.640	.....
East St. Louis & Suburban Ry.	.....	.....	.....	1.000
Illinois Power Co.	.....	.....	1.750	.....
Illinois Traction, Inc.	.....	2.000	.....	1.200
Rockford City Traction Co.	.....	.....	0.700	.....
St. Louis & Belleville Elec. Ry.	.....	.....	.....	0.663
Tri-City Ry. of Illinois	.....	.....	0.170	.....
Indiana				
Beech Grove Traction Corp.	.....	0.100	.....	.....
Chicago, So. Bend & No. Ind. Ry.	.....	.....	2.750	.....
Gary St. Ry.	0.834	.....	0.600	.....
Indianapolis St. Ry.	1.637	.....	28.330	.....
Indianapolis & Cincinnati Trac. Co.	.....	.....	.....	0.500
Interstate Public Service Co.	0.300	0.580	1.750	0.500
Northern Indiana Power Co.	.....	.....	0.142	.....
Southern Indiana Gas & Elec. Co.	1.300	.....	1.700	.....
Terre Haute, Indianapolis & Eastern Trac. Co.	0.200	.....	.....	.....
Union Traction Co. of Indiana	.....	0.126	.....	1.100
Iowa				
Clinton, Davenport & Muscatine Ry.	.....	0.800	.....	.....
Des Moines City Ry.	0.270	.....	0.110	.....
Dubuque Electric Co.	.....	.....	0.132	.....
Iowa So. Utilities Co., Burlington	21.00	.....	0.500	.....
Sioux City Service Co.	.....	.....	5.000	.....
Tri-City Ry. of Iowa	0.190	.....	0.100	.....
Kentucky				
Cincinnati, Newport & Covington Ry.	.....	.....	0.580	.....
Kentucky Trac. & Terminal Co.	.....	.....	1.180	.....
Louisville Ry.	.....	.....	1.830	.....
Michigan				
City of Detroit Dept. of St. Rys.	17.095	.....	2.489	.....
Grand Rapids Ry.	0.164	.....	3.192	.....
Lake Superior Dist. Power Co.	.....	.....	2.000	.....
Menominee & Marinette Lt. & Traction Co.	.....	.....	0.905	.....
Michigan Elec. Ry.	.....	.....	0.595	.....
Saginaw Transit Co.	.....	0.500	.....	.....
Detroit United Ry.	.....	1.4	.....	5.3
Minnesota				
Duluth St. Ry.	.....	.....	3.490	.....
Mankato Elec. Traction Co.	.....	.....	0.227	.....
Minneapolis St. Ry.	1.808	.....	6.020	.....
St. Paul City Ry.	1.619	.....	4.230	.....
Missouri				
Kansas City Rys.	0.462	.....	4.230	.....
St. Joseph Ry., Lt., Ht. & Pwr. Co.	.....	.....	2.900	.....
St. Louis Elec. Terminal Ry.	4.750	.....	.....	.....
United Railways of St. Louis	0.770	.....	13.510	0.890
Ohio				
Cincinnati, Georgetown & Portsmouth R.R.	.....	1.700	.....	.....
City of Ashtabula, Dept. of St. Rys.	.....	.....	0.284	.....
Cleveland Ry.	1.484	.....	10.381	.....
Cleveland, Southwestern Ry. & Lt. Co.	.....	.....	.....	9.500
Columbus, Delaware & Marion El. Co.	.....	.....	0.250	.....
Community Traction Co.	2.760	.....	1.180	.....
Dayton & Troy Elec. Ry.	.....	.....	2.000	.....
Indiana, Columbus & Eastern Tr. Co.	.....	.....	.....	0.090
Lima-Toledo R.R.	.....	0.560	.....	.....
Pennsylvania-Ohio Elec. Co.	.....	.....	0.642	.....
Pennsylvania-Ohio Pwr. & Lt. Co.	.....	.....	0.340	.....
Peoples Ry.	.....	.....	1.149	.....
Southern Ohio Public Service Co.	.....	.....	3.000	.....
Springfield Ry.	.....	.....	4.000	.....
Wisconsin				
Lake Superior District Ry.	.....	.....	1.990	.....
Madison Railways	.....	.....	0.303	.....
Milwaukee Elec. Ry. & Lt. Co.	1.770	.....	12.683	1.105
Milwaukee Northern Ry.	.....	.....	0.500	.....
Northern States Power Co.	.....	.....	1.000	.....
Wisconsin Pwr. & Lt. Co.	.....	.....	2.550	1.510
Wisconsin Valley Elec. Co.	.....	.....	0.644	.....
Total	72.705	64.449	155.646	26.916
Alabama				
Alabama Power Co.	1.165	.....	1.514	.....
Birmingham Elec. Co.	0.120	12.500	.....	.....
Mobile Light & R.R. Co.	.....	.....	1.360	.....
Arkansas				
Arkansas Central Pwr. Co.	.....	.....	4.77	.....
Intercity Terminal Ry.	1.24	.....	.....	.....
Florida				
Pensacola Electric Co.	.....	0.027	.....	.....
St. Johns Electric Co.	3.180	.....	1.560	.....
Tampa Electric Co.	.....	.....	3.000	.....
Georgia				
Columbus Elec. & Pwr. Co.	.....	.....	0.190	.....
Georgia Ry. & Pwr. Co.	2.845	.....	6.50	.....
Macon Ry. & Lt. Co.	.....	.....	1.100	.....
Savannah Elec. & Pwr. Co.	0.630	.....	0.230	.....
Louisiana				
Municipal St. Ry. Monroe	8.000	.....	0.340	.....
New Orleans Public Service, Inc.	3.466	.....	4.500	.....
Shreveport Rys.	1.530	.....	.....	.....
North Carolina				
Carolina Pwr. & Lt. Co.	.....	.....	0.400	.....
Durham Public Service Co.	.....	.....	0.310	.....
South Carolina				
Charleston Consolidated Ry. & Ltg. Co.	.....	.....	1.310	.....
Tennessee				
Memphis St. Ry.	1.830	.....	5.420	.....
Tennessee Electric Power Co.	.....	.....	2.000	.....
Union Traction Co., Nashville	.....	.....	.....	1.000
Total	24.006	12.527	34.504	1.000

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Track Built and Rebuilt During 1925—(Concluded)

Name of Company	Extension Miles City	Extension Miles Interurban	Rebuilt Miles City	Rebuilt Miles Interurban
California				
Key System Transit Co.	.....	.....	13.840	0.170
Los Angeles Ry.	3.900	.....	1.000	.....
Market St. Ry.	0.546	.....	4.274	0.076
Municipal Ry. of San Francisco	5.260	.....	0.500	.....
Pacific Elec. Ry.	0.920	11.390	5.870	8.910
Peninsular Ry.	0.025	.....	0.410	.....
Petaluma & Santa Rosa R.R.	.....	0.52	.....	.....
Sacramento Northern R.R.	.....	1.73	.....	.....
San Diego Elec. Ry.	3.240	.....	.....	.....
San Francisco, Napa & Calestoga Ry.	.....	1.400	.....	.....
Santa Barbara & Suburban Ry.	.....	.....	0.205	.....
Colorado				
Denver & Intermountain R.R.	.....	0.017	.....	.....
Denver Tramway	1.033	0.293	6.488	0.016
Fort Collins Municipal Ry.	0.500	.....	.....	.....
Kansas				
Topeka Ry.	.....	.....	0.759	.....
Nebraska				
Lincoln Traction Co.	.....	.....	0.265	.....
Omaha & Council Bluffs St. Ry.	.....	.....	6.000	.....
Omaha, Lincoln & Beatrice Ry.	0.150	.....	.....	0.380
New Mexico				
Las Vegas Transit Co.	.....	.....	0.500	.....
Oklahoma				
Northest Oklahoma R.R.	.....	2.452	.....	.....
Oklahoma Ry.	.....	1.500	0.8	.....
Oklahoma Union Ry.	1.500	.....	0.500	.....
Pittsburg County Ry.	0.682	0.133	.....	0.284
Oregon				
Portland Elec. Pwr. Co.	4.180	.....	2.110	.....
Texas				
Dallas Ry.	8.959	.....	.....	.....
Eastern Texas Electric Co.	0.210	.....	0.137	.....
El Paso Electric Ry.	0.057	.....	0.660	.....
Galveston Electric Co.	.....	.....	4.000	.....
Houston Electric Co.	1.315	.....	2.660	.....
Laredo Electric Ry.	1.000	.....	.....	.....
Northern Texas Traction Co.	.....	.....	6.300	1.290
Wichita Falls Traction Co.	12.500	3.200	1.000	.....
Washington				
Grays Harbor Ry. & Lt. Co.	.....	.....	0.142	.....
Puget Sound Int'l Ry. & Pwr. Co.	.....	0.227	.....	.....
Seattle Munic St. Ry.	6.134	.....	3.040	.....
Spokane United Rys.	.....	.....	1.750	.....
Tacoma Ry. & Pwr. Co.	.....	.....	2.000	.....
Total	52.111	22.862	65.210	11.126
CANADA				
Alberta				
Lethbridge Municipal Ry.	.....	.....	0.947	.....
British Columbia				
British Columbia Elec. Ry.	1.780	.....	0.700	.....
Manitoba				
Brandon Municipal St. Ry.	.....	.....	1.000	.....
Winnipeg Elec. Co.	2.370	.....	0.380	.....
New Brunswick				
New Brunswick Pwr. Co.	.....	.....	2.250	.....
Ontario				
Cornwall St. Ry.	.....	.....	0.500	.....
Hydro-Electric Rys.	5.600	.....	1.110	.....
London St. Ry.	.....	.....	0.519	.....
Niagara, St. Catherines & Toronto Ry.	0.587	.....	0.617	.....
Ottawa Electric Ry.	4.820	.....	1.510	.....
Toronto Transportation Com.	16.465	.....	1.541	.....
Quebec				
Hull Electric Co.	0.100	.....	.....	.....
Montreal Tramways	14.350	3.180	12.180	2.970
Quebec Ry., Lt. & Pwr. Co.	0.580	.....	0.786	.....
Sherbrooke Ry. & Pwr. Co.	.....	.....	0.470	.....
Saskatchewan				
Moose Jaw Elec. Ry.	.....	.....	1.090	.....
Regina Municipal Ry.	0.019	.....	.....	.....
	0.019	.....	1.090	.....
Total	46.671	3.180	25.600	2.970
Grand Total	227.312	112.483	485.746	93.155

electrification of the Long Island Railroad involved about 54 track-miles. Other important undertakings were carried out by the Norfolk & Western Railroad, the Virginian Railway, and the New York, New Haven & Hartford Railroad. Mileages of these electrifications are given in an accompanying table.

Electrified Steam Line Extensions

	Single Track, Miles
Staten Island Rapid Transit Co. (Baltimore & Ohio System)	56.00
Long Island Railroad	54.00
Norfolk & Western Railroad	52.75
Virginian Railway	38.40
New York, New Haven & Hartford Railroad	35.21
Total	236.36

Track abandoned during 1925 by electric railways which continued to operate elsewhere totaled about 240 miles, or somewhat less than for the preceding year. The abandonments were about equally divided between urban and interurban. Nearly all of the interurban track abandoned was dismantled and removed, but a considerable part of the abandoned city trackage was allowed to remain in place.

Some seventeen electric railways abandoned all their trackage and ceased rail operation entirely. These, however, were all comparatively small companies. So far as is known, no regular transportation service is now provided in these localities. The mileage of track totally abandoned in 1925 was about 50 miles less than the 1924 figure. Track rebuilt during the year was somewhat less than in 1924, totaling a little under 600 miles. In this figure, however, is not included a large amount of track on which considerable maintenance was done, but which was not entirely rebuilt.

Comparison of Track Construction by Years

Year	Extensions: No. of Companies	Urban Track	Interurban Track	Electrified Steam Lines	Total	Track Rebuilt
1907	(a)	(a)	(a)	.....	1,880.00	(a)
1908	157	1,174.5		84.00	1,258.50	(a)
1909	160	774.7		112.40	887.16	(a)
1910	217	1,204.8		192.40	1,397.20	(a)
1911	223	1,105.0		86.50	1,191.50	(a)
1912	171	869.4		80.80	950.20	(a)
1913	181	974.9		119.00	1,093.90	(a)
1914	163	716.5		229.00	946.40	(a)
1915	136	596.0		448.20	1,044.20	(a)
1916	104	115.40	240.90	388.00	744.30	(a)
1917	121	251.10	125.60	66.00	442.70	375.40
1918	80	216.41	97.41	275.70	589.53	155.43
1919	73	110.90	29.67	287.60	428.17	390.64
1920	87	145.69	30.87	8.92	185.48	361.77
1921	78	108.15	38.95	8.08	155.18	615.21
1922	104	126.27	85.11	12.35	223.73	739.70
1923	272	169.61	63.54	26.16	259.31	854.63
1924	243	218.085	93.988	83.39	395.463	764.323
1925	207	227.312	112.483	236.36	576.155	578.901

(a) Information not available.

Entire Properties Abandoned in 1925

Albia Light & Railway	7.00
Arkansas City-Winfield Northern Interurban Railway	20.50
Cleveland & Chagrin Falls Railway	12.00
Cleveland & Eastern Traction Company	40.00
Danville & Sunbury Transit Company	2.80
Gainesville Railway	10.00
Illinois Light & Traction Company	6.00
Jersey Shore & Antes Fort Railroad	2.75
Kentucky Utilities Company	3.30
Nassau County Railway	10.00
New Paltz, Highland & Poughkeepsie Traction Company	9.27
Skippack & Perkiomen Transit Company	13.00
Southeastern Ohio Railway	16.00
Troy & New England Railway	10.11
Valdosta Street Railway	5.25
Wahpeton Breckenridge Street Railway	1.00
Waupaca Electric Service & Railway	5.21
Total	174.19

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Suspensions and Partial Track Abandonments During 1925

Includes All Pieces of Track Sidings, Yards, Etc., Permanently Abandoned—Companies Arranged Alphabetically by States

	Miles of City Track			Miles of Interurban Track		
	Service Suspended	Abandoned	Removed	Service Suspended	Abandoned	Removed
Connecticut						
Connecticut Co.	.....	8.706	2.276	.....	69.801	0.430
Hartford & Springfield St. Ry.	.....	.....	.....	9.700	.....	.....
New York, New Haven & Hartford R.R.	.....	.....	.....	.....	.....	1.920
Maine						
Central Maine Power Co.	.....	.....	.....	9.000	.....	.....
Cumberland County Pwr. & Light Co.	.....	.280	.....	.....	.....	.....
Massachusetts						
Boston Elevated Ry.	17.203	6.630	1.400	.....	.....	.....
Boston & Worcester St. Ry.	6.000	.....	.....	.....	.....	.....
Eastern Massachusetts St. Ry.	.....	.....	.800	.....	.....	12.260
Interstate St. Ry.	.....	.....	.....	4.230	4.230	.....
New Bedford & Onset St. Ry.	.....	.....	.....	.....	.....	16.000
Plymouth & Brockton St. Ry.	7.000	.....	.....	.....	.....	.....
Springfield St. Ry.	1.320	.....	.....	.....	.....	.....
Worcester Consolidated St. Ry.	.....	.....	.....	64.250	.....	.....
New Hampshire						
Portsmouth Electric Ry.	7.650	.....	.....	10.330	.....	.....
Rhode Island						
Newport Electric Corp.	4.700	.....	.....	20.000	.....	.....
United Electric Rys.	1.580	1.580	.....	7.100	7.100	20.660
Vermont						
Bellows Falls & Saxtons River St. Ry.	2.000	.....	.....	4.000	.....	.....
District of Columbia						
Washington Ry. & El. Co.	2.627	.....	.260	5.619	1.600	3.250
Maryland						
Cumberland & Western-port Elec. Ry.	.....	.....	.....	16.600	.....	.....
United Rys. & Elec. Co.	.....	.....	.500	.....	.....	.....
New Jersey						
Ocean City Electric R.R.	.....	.500	.....	.....	.....	.....
Trenton & Mercer County Traction Co.	.....	.....	.....	.....	.....	5.670
New York						
Auburn & Syracuse Elec. R.R.	1.900	1.900	1.900	.....	.....	.....
Black River Traction Co.	.....	1.260	.....	.....	.....	.....
Hornell Traction Co.	.....	.....	.....	1.120	1.120	1.120
International Ry.	8.820	5.110	.790	.....	.....	.....
Jamestown Westfield & Northwestern R.R.	.....	.....	.....	8.000	.....	.....
Kingston Consol. R.R.	3.500	3.500	.....	.....	.....	.....
New York State Rys.	.....	.....	13.000	.....	.....	.....
New York & Queens County R.R.	.....	9.510	3.150	.....	.....	.....
Olean, Bradford & Salamanca Ry.	.750	.750	.330	9.000	9.000	.....
United Traction Co.	6.159	6.159	4.373	.....	.....	.....
Pennsylvania						
Beaver Valley Trac. Co.	8.000	.....	.....	.....	.....	.....
Chambersburg & Gettysburg Elec. Ry.	.....	2.000	.....	.....	.....	.....
Chambersburg & Shippensburg Ry.	.....	.....	.....	9.000	.....	.....
Citizens Traction Co.	.....	.....	.....	.500	.....	.....
Harrisburg Rys.	.320	.....	.....	.....	.....	.....
Lehigh Valley Transit Co.	.....	.....	.....	.....	6.350	.930
Mauch Chunk & Lehighton Transit Co.	.....	.....	.....	.....	4.000	.....
Pennsylvania & Maryland St. Ry.	.170	.....	.....	.....	.....	.....
Philadelphia Rapid Transit Co.	2.913	.....	12.340	3.879	.....	.....
Pittsburgh Rys.	1.560	.033	2.426	.....	.....	.082
Reading Transit Co.	.....	1.100	.....	.....	.....	.600
Stroudsburg Traction Co.	.500	.500	.500	.....	.....	.....
West Penn. Rys.	.....	.....	.637	.....	.....	.....
York Rys.	.....	.....	.....	.....	.....	.....
West Virginia						
Wheeling Pub. Serv. Co.	.....	4.000	.....	.....	.....	.....
Illinois						
Alton Granite & St. Louis Traction Co.	.....	.....	.....	.....	.019	.....
Aurora, Elgin & Fox River Electric Co.	.....	.....	.....	8.910	.....	.....
Bloomington, Pontiac & Joliet Elec. Ry.	.....	.....	.....	2.000	.....	.....
Central Illinois Public Service Co.	.....	.....	.....	7.410	.....	.....
Chicago North Shore & Milwaukee R.R.	.227	.....	.....	.....	.....	.....
Illinois Central Elec. Ry.	.....	.....	.....	6.350	.....	.....
Illinois Power & Light Corp., Galesburg	.....	2.600	.....	.....	.120	.....
Illinois Traction, Inc., Ill. Valley Div.	.330	.....	.....	.....	.....	.....
Tri-City Ry. of Illinois	.....	.....	.110	.....	.....	.....
Indiana						
Terre Haute, Indianapolis & Eastern Trac. Co.	.....	.....	.....	2.070	.....	.....
Iowa						
Clinton, Davenport & Muscatine Ry.	.....	.....	.....	.....	.....	.050
Des Moines & Central Iowa R.R.	.....	.....	.....	.....	.....	1.200
Iowa—Continued						
Iowa Southern Utilities Co., Burlington	2.500	.....	.....	.....	.....	.....
Iowa Southern Utilities Co., Centerville	1.250	.....	.....	.....	.....	.....
Omaha & Council Bluffs Ry. & Bridge Co.	.....	.....	1.000	.....	.....	.....
Tri-City Ry. of Iowa	.....	.....	.860	.....	.....	.....
Kentucky						
Paducah Ry.	.....	.....	.....	.....	.....	.473
Michigan						
Dept. of St. Rys., Detroit	.....	.....	.404	.....	.....	.....
Detroit United Ry.	4.700	4.700	.600	10.300	10.300	9.500
Grand Rapids Ry.	.....	.648	.....	.....	.....	.....
Menominee & Marinette Lt. & Trac. Co.	.....	.....	.735	.....	.....	.....
Missouri						
St. Louis Elec. Terminal Ry.	2.000	.....	1.300	.....	.....	.....
United Rys. Co. of St. Louis	.....	.....	1.000	.....	.....	.....
Ohio						
Cleveland Ry.	.668	1.859	.190	.....	.....	.....
Cleveland Southwestern Ry. & Lt. Co.	.....	.....	.....	.....	.....	22.500
Columbus, Urbana & Western Elec. Ry.	.....	.....	.....	7.500	.....	.....
Community Traction Co.	.510	.....	.210	.....	.....	.....
Southern Ohio Public Service Co.	2.000	.....	.....	.....	.....	.....
Toledo, Fostoria & Findlay Ry.	.....	.....	.....	.....	12.000	.....
Wisconsin						
Milwaukee Elec. Ry. & Lt. Co.	.....	1.317	.....	.....	.....	.....
Wisconsin Pwr. & Lt. Co.	2.000	.....	.....	.....	.....	.....
Alabama						
Alabama Power Co.	.....	.550	.....	.....	.....	.....
Florida						
Jacksonville Traction Co.	4.550	4.550	4.550	.....	.....	.....
Key West Electric Co.	1.900	.....	.....	.....	.....	.....
St. Johns Electric Co.	4.110	.....	.....	.....	.....	.....
Georgia						
Columbus Electric & Pwr. Co.	5.920	5.920	5.920	.....	.....	.....
Georgia Ry. & Pwr. Co.	9.050	9.050	.....	.....	.....	.....
Savannah Electric & Power Co.	.....	.....	.410	.....	.....	.....
Louisiana						
Louisiana Elec. Co., Inc.	2.650	.....	2.650	.....	.....	.....
New Orleans Public Service, Inc.	1.621	.....	3.696	.....	.....	.....
Mississippi						
Mississippi Power Co.	13.000	.....	.....	.....	.....	.....
North Carolina						
Durham Public Serv. Co.	4.100	4.100	.....	.....	.....	.....
South Carolina						
Charleston Consolidated Ry. & Ltg. Co.	.....	.330	.....	.....	.011	.....
Tennessee						
Memphis St. Ry.	.....	.....	.110	.....	.....	.....
California						
Pacific Electric Ry.	.....	12.180	.....	.....	2.020	.....
Petaluma & Santa Rosa R.R.	.....	.....	.....	5.430	.....	.....
San Diego Electric Ry.	1.510	.....	.....	.....	.....	.....
San Diego & Arizona Ry.	.....	.....	.....	4.412	.....	.761
San Francisco Napa & Calistoga Ry.	.....	.....	.....	1.400	.....	.....
Colorado						
Denver Tramways	.....	.....	2.590	.....	.....	.....
Kansas						
Arkansas Valley Interurban Ry.	.....	2.000	.....	.....	.....	.630
Kansas City, Leavenworth & Western Ry.	5.360	.....	5.360	.....	.....	.....
Topeka Ry.	2.770	1.700	.345	.....	.....	.....
Oklahoma						
Northeast Oklahoma R.R.	.....	.....	.....	.394	.....	.394
Texas						
Dallas Ry.	.....	.....	.422	.....	.....	.....
Eastern Texas Elec. Co.	.....	.....	.....	.....	.....	.....
El Paso Electric Co.	.570	.....	.....	.....	.....	.....
Galveston Electric Co.	.....	1.000	1.000	.....	.....	.....
Houston Electric Co.	1.090	.....	1.274	.....	.....	.....
Rio Grande Valley Traction Co.	.....	.....	.....	6.940	.....	.....
Southwestern Traction Co.	.800	.800	.800	.....	.....	.....
Washington						
Grays Harbor Ry. & Lt. Co.	1.350	.....	.....	.....	.....	.....
Seattle Municipal St. Ry.	2.965	.....	.....	.....	.....	.....
Spokane United Rys.	.....	2.361	2.361	.....	.....	.....
Canada						
British Columbia Electric Ry.	.....	.....	.....	.....	.....	24.440
Hydro-Electric Rys.	.....	.720	.....	.....	.....	.....
Toronto Transportation Commission	.....	2.901	.....	.....	.....	.....
Montreal Tramways	.....	.....	2.030	.....	.....	.....
Quebec Ry. Lt. & Pwr. Co.	1.420	1.420	.710	.....	.....	.....
Totals	165.593	114.224	85.319	245.444	127.671	122.870

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Car Purchases During 1925 Were Below Requirements

Reduction in the Number of New Cars Ordered This Year Emphasizes the Importance of Directing Increased Attention to Replacement of Obsolete Equipment—New England Was the Only Section Reporting Increased Purchases Over Last Year

NEW car purchases during 1925 show a material reduction below previous years. The statistics of new rolling stock given in the tables and charts herewith indicate that electric railways have not only failed to buy equipment over a period of years at a rate sufficient to provide adequate replacements, but have seriously fallen behind their average during the past year. The need for directing increased attention to the subject of replacing obsolete equipment at a rate sufficient to keep pace with modern transportation standards thus becomes obvious. The total of 1,659 cars and electric locomotives ordered during 1925 is the second lowest recorded for any year since 1907. The lowest was in 1921 with a total of 1,276 cars and electric locomotives. Purchases of buses by electric railways, on the other hand, show a large increase over previous years. Detailed statistics on this subject are given in another article in this issue.

NEW ROLLING STOCK ORDERED DURING LAST FIVE YEARS

Year	Passenger Cars: City	Passenger Cars: Interurban	Passenger Cars: Total	Express, Freight, Service, Locomotives and Miscellaneous	Grand Total
1921	1,059	129	1,188	88	1,276
1922	2,912	187	3,099	439	3,538
1923	2,915	427	3,342	687	4,029
1924	1,985	538	2,523	1.569	4,092
1925	1,054	320	1,374	285	1,659

Information received from practically every electric railway in the United States and Canada shows that there were 94 companies that bought new cars during 1925, but that the majority of purchases were confined to fifteen companies, which accounts for a total of 965 of the new passenger cars. The railways that purchased twenty or more cars are shown in Table III.

The special comparisons of types of cars which were purchased during 1925 as given in Table VI and in several of the diagrams show that for city service the one-man two-man type of car is being bought in greatest quantities. Cars for rapid transit service form 14.4 per cent of the orders, two-man cars 22 per cent, and the one-man car but 11.6 per cent. One of the charts illustrates in a very striking manner the rise and fall in popularity of the one-man car of approximately 28-ft. length which is commonly known as the safety car, and the rapid increase in popularity of the one-man two-man car which first made its appearance in 1922. For city service there were 512 one-man two-man cars purchased last year and 245 two-man cars. Motor cars for rapid transit service constitute the next greatest number, there being 160 of these. There were 129 one-man cars. Of this latter class, 55 were with bodies approximately 28 ft. long, 56 were single-truck cars with bodies longer

Table I—New Rolling Stock Ordered Since 1907

Year	Passenger Cars: City	Passenger Cars: Interurban	Freight and Miscellaneous Cars	Electric Locomotives	Total
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	505	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598
1921	1,059	129	81	7	1,276
1922	2,912	187	405	34	3,538
1923	2,915	427	595	92	4,029
1924	1,985	538	1,538	31	4,092
1925	1,054	320	238	47	1,659

(a) Included in "Freight and Miscellaneous Cars."

Table II—Special Comparison of New Rolling Stock Orders by Years

	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916
Number of railways reporting new cars	94	119	167	145	94	172	160	140	182	250
City Service										
Number of one-man cars (28-ft. body S. T.)	55	103	312	772	565	1,699	1,383	644	280	187
Number of one-man cars other than 28-ft. body	74	96	183	227	.....	.....	.....	.....	.....	.....
Number of one-man, two-man cars	512	1,224	1,076	471	.....	.....	.....	.....	.....	.....
Number of two-man passenger motor cars*	405	537	1,097	1,290	383	847	635	1,068	1,316	2,731
Number of passenger trailers	8	25	247	150	111	343	111	130	402	128
Service cars	70	44	121	103	47	104	31	(a)	(a)	(a)
Total cars city service	1,124	2,029	3,036	3,015	1,106	2,993	2,160	1,842	1,998	3,046
Interurban Service										
Number of one-man cars	3	61	56	40	.....	.....	.....	.....	.....	.....
Number of one-man, two-man cars	70	38	38	9	.....	.....	.....	.....	.....	.....
Number of two-man motor cars*	207	435	330	122	103	195	96	200	158	303
Number of passenger trailers	40	4	3	16	26	32	32	55	27	71
Number of freight, express and miscellaneous cars	168	1,494	474	302	34	361	141	(a)	(a)	(a)
Total cars interurban service	488	2,032	901	489	163	588	269	255	185	374
Total number of cars	1,612	4,061	3,937	3,538	1,269	3,581	2,429	2,375	2,406	3,911
Number of electric locomotives	47	31	92	34	7	17	18	44	49	31

*Includes motor and trail cars for subway, elevated and train service. (a) Not available.

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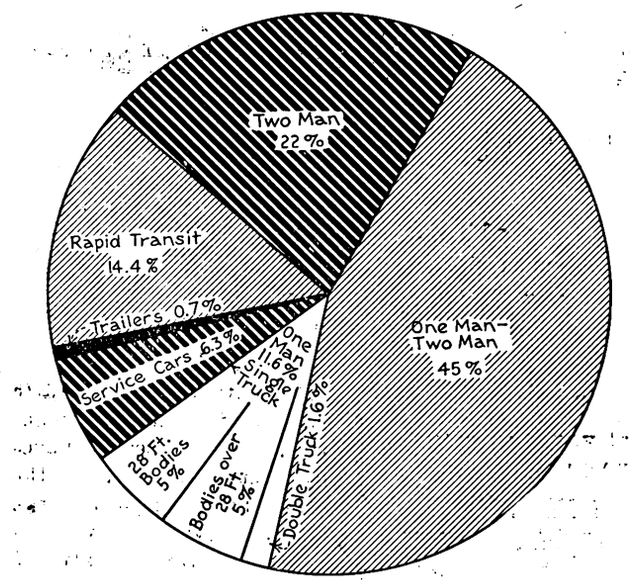
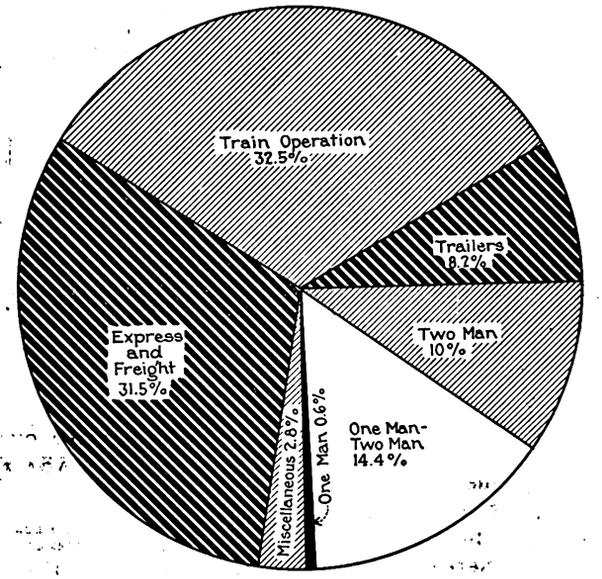


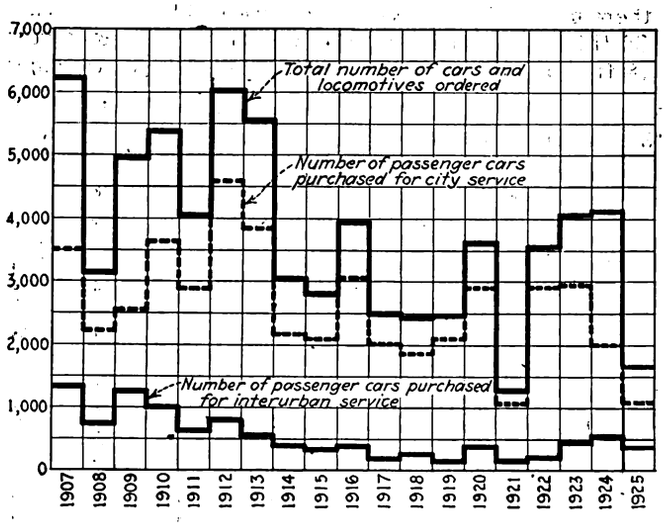
Diagram Showing the Proportion of Total City Cars for Each Type Purchased in 1925



This Shows the Various Types of Interurban Cars Purchased Last Year as a per Cent of the Total for This Class

Table III—Companies Purchasing 20 or More Passenger Cars

Boston Elevated Railway	100	surface cars and 60 rapid transit cars
Pittsburgh Railways	83	one-man two-man city cars and 20 one-man two-man interurban cars
Chicago Rapid Transit Company	100	motor cars for rapid transit service
Philadelphia Rapid Transit Company	100	one-man two-man surface cars
Baltimore & Ohio Railroad	90	motor cars and 10 trailers for rapid transit service
Cleveland Railways built	95	two-man cars in its shops
Georgia Railway & Power Company	40	one-man two-man city cars and 20 two-man cars
Key System Transit Company	42	city cars of two-man type
Chicago, South Shore & South Bend Railway	15	interurban passenger cars, 10 combination passenger and baggage cars, 2 parlor car trailers and 2 diner trailers
New York, New Haven & Hartford Railroad	13	motor cars and 22 trailers for train operation
Grand Rapids Railway	27	one-man two-man city cars
United Electric Railways of Providence	25	one-man two-man city cars
Chicago, North Shore & Milwaukee Railway	20	interurban motor cars and 4 diner trailers
Market Street Railway, San Francisco, built	24	two-man city cars
Columbus Railway & Power Company	23	two-man city cars
United Railways of Baltimore	22	one-man two-man city cars
Manila Electric Railway	20	two-man city cars



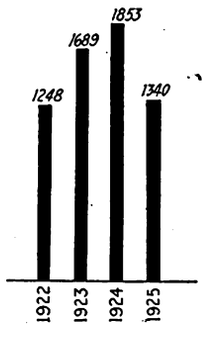
Graphical Analysis of Total Cars and Locomotives and Passenger Cars for City and Interurban Purchased During Past Nineteen Years

than 28 ft., and eighteen of these one-man units were double-truck cars.

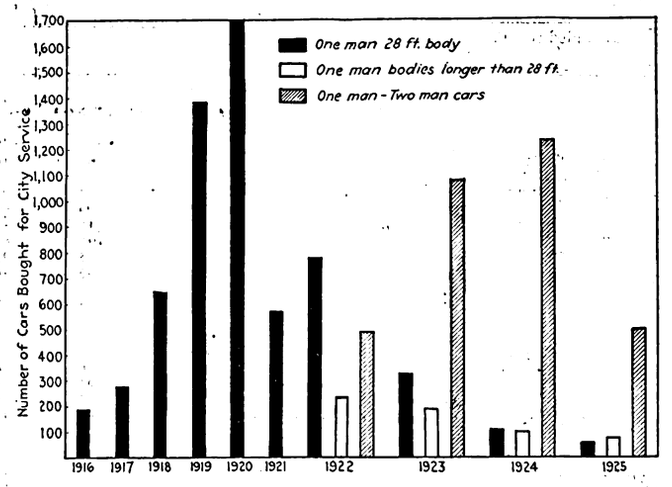
The analysis of cars bought for interurban service shows that those purchased for train operation constitute the greatest number, there being 158 motor cars and 40 trailers or more than 40 per cent of the total interurban passenger cars purchased. Next to these, the one-man two-man type of car proved most popular. There were but three one-man cars purchased for interurban service.

Purchases of electric locomotives were slightly greater last year than for 1924, there being 47 electric locomotives bought during 1925 as compared with 31 during 1924. The order of the Pennsylvania Railroad for 24 locomotives of 75 tons each constitutes the greatest proportion of those ordered. The remaining 23 locomotives were distributed among twelve other companies.

A special comparison of cars ordered during the past ten years is given in Table II. Separate tabulations are



Number of Cars Reported as Junked During Last Four Years



Graph Showing Relative Purchases of One-Man and One-Man, Two-Man Cars During the Past Ten Years

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Table IV—Details of Rolling Stock Ordered During 1925

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
New England States											
Connecticut											
Connecticut Co.	1	Derrick	City	Motor	Double	40— 0	32.70				
New York New Haven & Hartford R.R.	13	Passenger	Interurban	Motor	Double	80— 1½	87.75	4	120	Train	
New York New Haven & Hartford R.R.	22	Passenger	Interurban	Trailer	Double	80— 1½	52.00		120	Train	
Maine											
Androscoggin Kennebec Ry.											6 CM
Cumberland County Pwr. & Lt. Co.	1	Work	City	Motor	Double	24— 0	21.5				3 CM
York Utilities Co.	1	Work	City	Motor		37— 0					
Massachusetts											
Boston Elevated Ry.	60	Passenger	City	Motor	Double	69— 2½	41.00	2	72	Train	
	100	Passenger	City	Motor	Double	45— 0	15.50	4	48	Both	
Eastern Mass. St. Ry.											82 CM
											14 SP
											5 SM
East Taunton St. Ry.	2	Passenger	City	Motor	Double	36—10	15.25	4	40	Both	
Interstate Consolidated St., Ry.	3	Passenger	City	Motor	Single	28— 0½	8.05	2	33	One	
Interstate Consolidated St., Ry.	5	Passenger	City	Motor	Double	40— 3		4	44	Both	
Middlesex & Boston St. Ry.											46 CM
Springfield St. Ry.	1	Passenger	City	Motor	Double	41— 0	12.00	4	44	Both	
New Hampshire											
Portsmouth El. Ry.											15 CM
Rhode Island											
United Elec. Rys. (Providence)	25	Passenger	City	Motor	Double	41— 0	15.50	4	38	Both	
Total cars New England States	234										
Eastern States											
District of Columbia											
Washington Ry. & Elec. Co.	2	Sweepers	City	Motor	Single	28— 4	16.25				
Maryland											
Baltimore & Ohio R.R. Co. (Staten Is. Lines)	90	Passenger	Interurban	Motor	Double	67— 3½	47.875	2	71	Train	
Baltimore & Ohio R.R. Co. (Staten Is. Lines)	10	Passenger	Interurban	Trailer	Double	67— 3½	41.63		71	Train	
United Rys. & Elec. Co.	22	Passenger	City	Motor	Double	44—10	20.50	2	49	Both	83 CM
United Rys. & Elec. Co.	1	Crane and Plow	City	Motor	Double	44— 0	34.00	4			
New York											
Binghamton Ry.	5	Passenger	City	Motor	Double			4	34	Both	
Brooklyn-Manhattan Transit Co.	2	Freight	City	Trailers	Double						472 CM
Brooklyn-Manhattan Transit Co.	2	Crane	City	Trailer	Double	44— 0	25.00				
Elmira Water, Lt. & R.R. Co.	2	Passenger	City	Motor	Single	27— 9⅞	18.34	2	32	One	
Interborough Rapid Transit Co.											4 CM
New York & Long Island Tract. Co.	1	Sweeper	City	Motor	Single	28— 6	12.00	2			
Poughkeepsie & Wappinger Falls Ry.											16 CM
Schnectady Ry.	12	Passenger	City	Motor	Double	41— 4½	17.25	4	44	One	
Schnectady Ry.	1	Dump	City	Motor	Double	40— 0	25.00	4			
Southern New York Ry., Inc.											4 IM
Pennsylvania											
Allegheny Valley St. Ry.	1	Sweeper	City	Motor	Single	28— 3	13.00				
Altoona & Logan Valley Elec. Ry.	13	Passenger	City	Motor	Double	41—10	18.20	4	44	Both	25 STCM
Conestoga Traction Co.	3	Passenger	City	Motor	Single	30— 0	9.00	2	31	One	
Harrisburg Railways											6 CMO
Lackawanna & Wyoming Valley R.R.	4	Passenger	Interurban	Motor	Double	60— 6	40.50	2	72	Two	
Lehigh Traction Co.	13	Passenger	City	Motor	Double	48— 8	24.50	4	70	Two	8 CM
Pennsylvania R.R.	8	Passenger	Interurban	Motor	Double	54— 0	58.30	2	72	Train	
Philadelphia Rapid Transit Co.	100	Passenger	City	Motor	Double	45— 6	18.31	2	53	Both	101 CM
Philadelphia Rapid Tranist Co.	1	El. Crane	City	Motor	Double	55— 0	46.82	4			49 Work
Philadelphia Rys.											3 CM
Philadelphia & West Chester Trac. Co.	12	Passenger	Interurban	Motor	Double	47—10	29.82	4	62	Two	
Pittsburgh Railways	83	Passenger	City	Motor	Double	45— 2	18.75	4	52	Both	
Pittsburgh Railways	20	Passenger	Interurban	Motor	Double	45— 2	19.75	4	50	Both	
Reading Transit Co.	1	Sweeper	City	Motor	Double						5 CMO
Scranton Ry.	10	Passenger	City	Motor	Double	41—10	18.50	4	44	Both	
Shamokin & Mt. Carmel Transit Co.	3	Passenger	Interurban	Motor	Double	45— 0	17.89	4	48	Both	
Stroudsburg Traction Co.											2 CM
Webster, Monessen, Belle Vernon & Fayette City St. Ry.	3	Passenger	City	Motor	Double	41— 2	17.50	4	46	Both	
West Side Elec. St. Ry.	3	Passenger	City	Motor	Double	41— 2	17.50	4	46	Both	
Virginia											
Virginia Ry. & Pwr.	15	Passenger	City	Motor	Double	40— 1			40	Both	
Total cars Eastern States	443										
Central States											
Illinois	3	Freight	Interurban	Motor	Double	36— 0					4 CM
Chicago North Shore & Milwaukee R.R.	20	Passenger	Interurban	Motor	Double	55— 3½	51.00	4	54	Train	
	4	Diner	Interurban	Trailer	Double	55— 3½	51.50		24	Train	
	5	Freight	Interurban	Trailer	Double	50— 0	34.00			Train	
Chicago Rapid Transit Co.	100	Passenger	City	Motor	Double					Train	
East St. Louis & Suburban Ry.	1	Dump	City	Trailer	Double	40— 0	16.00				
Illinois Pwr. & Lt. Corp. (Galesburg)											14 CM
Illinois Traction Inc.	100	Freight	Interurban	Trailer	Double	36— 0				Train	
Kewanee & Galva Ry.	1	Passenger	Interurban	Motor	Double	40— 3	13.00	4	50	One	
Indiana											
Burch Grove Traction Corp.											2 IM
Chicago South Shore & South Bend Ry.	15	Passenger	Interurban	Motor	Double	60— 0			56	Train	
	10	Passenger Baggage	Interurban	Motor	Double	60— 0			44	Train	
	2	Parlor	Interurban	Trailer	Double	64— 0			37	Train	
	2	Diner	Interurban	Trailer	Double	64— 0			24	Train	
Evansville & Ohio Valley Ry.	6	Passenger	Interurban	Motor	Double	44— 4	17.00	4	48	Both	
Gary Street Ry.	5	Passenger	City	Motor	Single	30— 0	6.00	2	32	One	
Gary & Hobart Trac. Co.	3	Passenger	Interurban	Motor	Double	44— 8½	21.26	4	44	Both	
Indiana Service Corp.	5	Passenger	Interurban	Motor	Double	61— 6	46.00	4	50	Two	
	6	Dump	Interurban	Trailer	Double	40— 0	17.00				
	2	Passenger	Interurban	Motor	Double	61— 6	42.50	2	50	Train	
Interstate Public Service Co.	1	Parlor & Dining	Interurban	Motor	Double	59— 0	46.50	2	24	Two	
Interstate Public Service Co.	6	Work	Interurban	Trailer	Double	40— 0	18.30				
Northern Indiana Pwr. Co.	2	Freight	Interurban	Trailer	Double	25— 0					
Union Traction Co. of Indiana	15	Passenger	Interurban	Motor	Double	65— 5	45.00	4	60	Two	
Iowa											
Iowa Southern Utilities Corp. (Burlington)	1	Sweeper	City	Motor							

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Table IV—Details of Rolling Stock Ordered During 1925—(Continued)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
Kentucky											
Kentucky Traction & Terminal Co	2	Passenger	City	Motor	Single	26— 6	9.00	2	24	One	2 CM
Michigan											
Dept. Street Railways (Detroit)	6	Dump	City	Trailer	Double	40— 0	17.00				
Dept. Street Railways (Detroit)	2	Dump	City	Motor	Double	40— 0	25.00	4			10 CM
Detroit United Ry											30 CM 2 SM
Grand Rapids Ry	27	Passenger	City	Motor	Double	37— 1		4	43	Both	
Lake Superior District Power Co	1	Passenger	Interurban	Motor	Double	40— 6	13.00	4	44	One	
Menominee & Marinette Lt. & Trac. Co											4 CM
Minnesota											
Twin City Rapid Transit Co	5	Passenger	City	Motor	Double	35—10	12.10	4	43	One	
	1	Passenger	City	Motor	Double	46— 8	12.25	4	57	Two	
	1	Passenger	City	Motor	Double	46— 8	13.40	4	50	Two	
Missouri											
Missouri & Kansas Ry	2	Passenger	Interurban	Motor	Double	45— 0	20.00	4	54	Both	
Missouri & Kansas Ry	1	Passenger	Interurban	Motor	Double	47— 0	21.00	4	54	Both	
United Rys. Co. of St. Louis											32 CM
Ohio											
Cincinnati St. Ry. (Traction Co.)	1	Dump	City	Trailer	Double	42— 0	34.00	4			
Cincinnati Trac. Co	1	Crane	City	Motor	Double	44— 0	34.00	4			
Cincinnati Trac. Co	1	Dump	City	Trailer	Double	40— 0	16.00				
Cleveland Railways	95	Passenger	City	Motor	Double	51— 2	20.80	4	55	Two	
	4	Crane	City	Motor	Double	44— 0	34.00	4			
	4	Dump	City	Motor	Double	40— 0	25.00	4			
	2	Dump	City	Trailer	Double	40— 0	16.00				
	2	Rail cars	City	Trailer	Double	64— 0					
	3	Sweepers	City	Motor	Double						
Cleveland So. Western Ry. & Lt. Co											8 CM
Columbus, Delaware & Marion Elec. Co	2	Parlor	Interurban	Motor	Double	63— 4	56.75			Two	
Columbus Ry. Pwr. & Lt. Co	23	Passenger	City	Motor	Double	45— 3½	18.31	4	48	Two	
Dayton, Springfield & Xenia Southern Ry	1	Passenger	Interurban	Motor	Double	42— 9	13.00	4	52	Both	
Lima Toledo R.R. Co	10	Freight	Interurban	Trailer	Double	49— 5	20.00				
Northern Ohio Trac. & Lt. Co	25	Freight	Interurban	Trailer	Double	49— 8					
Northern Ohio Trac. & Lt. Co	6	Freight	Interurban	Trailers	Double	42— 6½					
Ohio River Elec. Ry. Co	7	Passenger	City	Motor	Single	26— 6	9.00	2	24	One	
Pennsylvania-Ohio Elec. Co	13	Passenger	City	Motor	Double	43— 0	16.00	4	44	Both	14 CM 18 IM 1 IT
Stark Elec. Co	1	Dump	Interurban	Trailer	Double	40— 0	16.00				
Toledo, Bowling Green & Southern Trac. Co	1	Freight	Interurban	Motor	Double	51— 0	39.50				
Youngstown Municipal Ry	13	Passenger	City	Motor	Double	43— 0	16.00	4	44	Both	
Youngstown & Surburban Ry	4	Passenger	Interurban	Motor	Double	41—10	17.80	4	44	Both	
Wisconsin											
Lake Superior Dist. Pwr. Co	1	Passenger	Interurban	Motor	Double	40— 3	17.25	4	50	Both	
Madison Railways	12	Passenger	City	Motor	Single	28—10	9.00	2	32	One	
Milwaukee Elec. Ry. Lt. Co	2	Passenger	City	Trailer	Double	53— 5	18.10				16 CM 2 Salt 1 Work 1 IM
Wisconsin Pwr. & Lt. Co											
Total cars Central States	597										
Southern States											
Alabama											
Alabama Pwr. Co	2	Passenger	City	Motor	Single	32— 0	7.50	2	32	One	
Mobile Light & R.R. Co	2	Flat	City	Motor	Double	36— 0	6.00				3 CM
Mobile Light & R.R. Co	2	Work	City	Motor	Single	24— 0	4.00				
Arkansas											
Pine Bluff Co	2	Passenger	City	Motor	Single	28— 0½	8.00	2	32	One	
Florida											
Coral Gables Utility Corp	2	Passenger	Interurban	Motor	Double	40— 1		4	44	Both	
	1	Passenger	Interurban	Motor	Double	47— 8	18.82	4	52	Both	
	3	Passenger	City	Motor	Double	28— 0½	8.61	2	33	One	
	9	Passenger	Interurban	Motor	Double			4		Both	
Miami Trac. Co	15	Passenger	City	Motor	Double	28— 0½	8.61	2	33	One	
Municipal Railway of South Jacksonville	4	Passenger	City	Motor	Single	28— 0½				One	
Tampa Elec. Co	7	Passenger	City	Motor	Double	45— 7	16.00	4	52	Both	
Georgia											
Atlanta Northern Ry	5	Passenger	Interurban	Motor	Double	46— 5	18.00	4	51	Both	
Columbus Elec. & Pwr. Co											16 CM
Georgia Ry. & Pwr. Co	20	Passenger	City	Motor	Double	46— 2	18.22	4	48	Two	60 CM
Georgia Ry. & Pwr. Co	40	Passenger	City	Motor	Double	46— 4	18.64	4	50	Both	
Savanah Elec. & Pwr. Co											4 CM
North Carolina											
Ashville Pwr. & Light Co	12	Passenger	City	Motor	Single	28— 0½	8.34	2	33	One	
Ashville Pwr. & Light Co	4	Passenger	City	Motor	Single	33— 0	11.10	2	40	One	
Tide Water Power Co											3 CM
Tennessee											
Knoxville Pwr. & Lt. Co	16	Passenger	City	Motor	Single	29— 6	8.50	2	29	One	
Union Trac. Co	1	Passenger	Interurban	Motor	Double	43— 1	15.00	4	42	Two	
	1	Freight	Interurban	Motor	Double	43— 1	15.00				
	1	Work	Interurban	Trailer							
Total cars Southern States	149										
Western States											
California											
Key System Transit Co	41	Passenger	City	Motor	Double	45— 6	20.50	4	48	Two	10 CM
	1	Passenger	City	Motor	Double	48— 0	24.00	4	52	Two	
	1	Work	City	Trailer	Double	20— 4					
Market Street Ry	24	Passenger	City	Motor	Double	47— 0	19.50	4	50	Two	10 CM
Pacific Electric Ry											14 CM 6 CS 33 IF
San Diego El. Ry	6	Work	City	Trailer	Double	40— 0	23.00				
Kansas											
Topeka Ry											10 CM
Oklahoma											
Northeast Oklahoma R.R.											2 CM
klahoma Ry	10	Passenger	City	Motor	Single	30— 0	8.00	2	32	One	

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Table IV—Details of Rolling Stock Ordered During 1925—(Concluded)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
Oregon											
Portland Electric Pwr. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 CM
Texas											
El Paso Elec. Ry. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 CM
Southeastern Traction Co.	1	Passenger	Interurban	Motor	Double	30— 0	10.50	2	32	One	.....
Total cars Western States	84										
Cuba											
Havana Central R.R.	8	Passenger	Interurban	Motor	Double	51— 9	25.10	4	60	Two	.....
Philippine Islands											
Manila Electric Co.	20	Passenger	City	Motor	Double	41— 5	14.00	2	60	Two	.....
Total cars Extraterritorial	28										
Dominion of Canada											
British Columbia											
British Columbia El. Ry.	6	Passenger	City	Motor	Double	48— 8	23.15	4	48	Two	1 CL
	6	Passenger	City	Trailer	Double	48— 8	22.90	.....	55	Train	1 CS
	1	Flat	Interurban	Trailer	Double	37— 0	15.50	.....	.....	.....	.....
	1	Work	City	Motor	Single	10— 0	8.00	2	.....	.....	.....
New Brunswick											
New Brunswick Pwr. Co.	2	Passenger	City	Motor	Single	31— 0	12.00	2	30	One	.....
Ontario											
Cornwall Street Ry.	1	Passenger	City	Motor	Double	30— 0	12.00	2	30	One	.....
Hydro-Electric Pwr. Comm.	3	Passenger	City	Motor	Double	45— 4	22.00	4	44	Both	.....
Hydro-Electric Pwr. Comm.	1	Passenger	Interurban	Motor	Double	50— 0	27.00	4	54	Two	.....
Niagara, St. Catharines & Toronto Ry.	12	Passenger	City	Motor	Double	46— 6	14.90	4	44	Both	.....
Oshawa Ry.	1	Work	City	Motor	.....	.....	.....	.....	.....	.....	.....
Ottawa Electric Ry.	10	Passenger	City	Motor	Double	45— 0	19.50	4	54	Both	.....
Ottawa Electric Ry.	2	Sweeper	City	Motor	Single	24—10	.....	2	.....	.....	.....
Public Utilities Comm. of Kitchener	1	Sweeper	City	Motor	Single	22— 0	.....	.....	.....	.....	.....
Quebec											
Canadian National Rys.	12	Passenger	Interurban	Motor	Double	42— 6	15.00	4	44	Both	.....
Montreal Tramways	3	Sweeper	City	Motor	Single	24—10	16.00	2	.....	.....	.....
	1	Plow	City	Motor	Single	26— 0	19.00	2	.....	.....	.....
	1	Dump	City	Motor	Double	40— 0	25.15	4	.....	.....	.....
	2	Rail	City	Motor	Double	42— 0	24.50	4	.....	.....	.....
	4	Flat	City	Motor	Double	34— 0	20.75	.....	.....	.....	48 CM
New Foundland Lt. & Pwr. Co.	7	Passenger	City	Motor	Single	28— 0½	11.00	2	30	One	.....
Total cars Canada	77										

Abbreviations used for cars junked.
CM—city motor cars. CS—city service cars. STCM—single truck city motor cars. IM—interurban motor cars.
CMO—open city motor cars. CL—city line cars. SP—snow plows. IT—interurban trailers.
SM—service motor cars. IF—interurban freight cars.

given for cars in city service and those in interurban service. Referring to this table, it is interesting to note how the number of safety cars purchased increased each year from 1916 up to and including 1920, and during the same period how the number of large two-man cars gradually decreased. A comparison by percentage that the number of cars purchased bears to the total shows that the highest percentage for safety cars was reached in 1919. One-man, two-man cars increased each year from 1922 to 1924, but the number purchased during 1925 has fallen off to less than one-half those purchased during 1924.

Details of rolling stock ordered by individual companies are given in Table IV. The railways in each state are grouped and the various states are arranged into groups which follow the same arrangement as that used by the United States Census Bureau. This arrangement is the same as that used for the 1924 statistics. Companies in Canada, Cuba and the Philippine Islands are listed separately. In addition to listing the number of cars ordered by the various companies, this table classifies the cars as to type of service and gives information as to length, seating capacity, weight, number of motors and general characteristics, such as motor or trailer and single or double truck.

The recapitulation by districts shows that very few cars were bought by companies in the Western states, there being but five companies that reported a total of 83 city cars purchased and one company that reported new interurban cars. During 1924 this district showed the greatest number of cars purchased. Eighteen companies reported a total of 1,663 cars and locomotives bought for city and interurban service. Omitting express, freight, service and miscellaneous cars, there were 76 passenger cars purchased for city service during 1925, as against 271 passenger cars for city service during 1924. Only one interurban car was reported for 1925 as against 27 purchased during 1924. Comparison of other districts shows that the New England district purchased 234 cars during 1925 as against 92 in 1924; the Eastern states, 443 during 1925 as compared with 1,206 in 1924; the Central states, 597 in 1925 as against 849 in 1924; and the Southern states, 149 in 1925 as compared with 158 in 1924. Canada reported 77 cars for 1925 as against 98 for 1924.

For convenience in comparing detailed figures, and in order to show at a glance the relative amount of rolling stock purchased by the various railways year by year, Table I has been prepared. This gives the total number of cars ordered each year since 1907. Cars purchased are divided into four classes: Passenger cars, both city and interurban; freight, express and miscellaneous cars; and electric locomotives. The miscellaneous cars include service cars, snow plows, sweepers, work cars, etc. Three graphs have been prepared to show graphically the number of cars ordered each year since 1916. One of these gives the total number of cars and locomotives; the second one gives purchases of passenger cars for city service and the third interurban cars bought for passenger service. The number of passenger cars bought for city service annually has been decreasing since 1923. The number purchased in 1925 is approximately the same as for 1921, which is the lowest year recorded. Purchases of interurban cars

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increased from 1921 to 1924, but 1925 shows a drop of about six-tenths of the number purchased in 1924.

A study of the various one-man two-man cars ordered during 1925 for city service shows that they run quite uniform in length, weight and seating capacity. Lengths vary from 36 ft. 10 in. to 47 ft. 7 in., weights from 14.9 tons to 20.5 tons, and seating capacity from 34 to 54. The weighted average for all cars of this class purchased during 1925 gives a length of 44 ft. 1 in., a weight of 18.07 tons and a seating capacity of 48. It is interesting to compare these dimensions with similar ones made from a study of the one-man two-man cars ordered in 1923. The weighted average for the cars was 45 ft. 1 in. long with a seating capacity of 54. It thus appears that the tendency during 1925 is to use a car slightly smaller in size than those of 1923. In general design, the cars have remained about the same for the last three years. Wheels of 26-in. diameter are most commonly used and platforms are either level with the car floor or with a slight ramp, a single intermediate step being used between the roadway and the car platform. Arch type roof construction is used in most cases.

The number of cars junked during 1925 is less than for 1923 and 1924, but is slightly greater than for 1922, there being a total of 1,340 cars reported as scrapped during 1925. The majority of these are motor cars in city service. The largest number of cars reported as junked by individual railways was 472 by the Brooklyn-Manhattan Transit Corporation and 101 by the Philadelphia Rapid Transit Company, 83 by the United Railways & Electric Company of Baltimore, and 82 by the Eastern Massachusetts Street Railway. An accompanying diagram shows graphically the number of cars junked during the past four years.

The accompanying tables and graphical charts of rolling stock were prepared from information obtained from replies to questionnaires sent to all the electric railways in the United States and Canada. This was supplemented by information which had been previously obtained and published in ELECTRIC RAILWAY JOURNAL, and from lists of cars furnished by the principal car manufacturers. It is quite impossible to receive replies from all railways when a definite time for publication must be met, but this year's information has been particularly complete and the lists received from manufacturers has enabled a careful check to be made of the figures obtained from the various railways. In some cases where replies were not received from the operating companies, the information furnished by the car manufacturers has been used in the tables.

Table V—Electric Locomotives Ordered During 1925

Name of Railway	Number	Weight, Tons	Length Over All Ft. In.
New England States			
Aroostook Valley R.R.	1	50	.....
New York, New Haven & Hartford R.R.	3	80	37—6
Eastern States			
Delaware, Lackawanna & Western R.R.	1	50	29—0
New York Rapid Transit Corp.	1	50	37—4
Pennsylvania R.R.	24	75	.....
Central States			
Chicago, South Shore & South Bend Ry.	4	80	.....
Great Northern R.R.	4	177	.....
Michigan Central R.R.	2	120	42—2
St. Louis and Belleville El. Ry.	1	80	40—0
Western States			
San Diego Electric Ry.	1	50	40—0
Cuba			
Hershey Cuban Ry.	3	60	37—4
Canada			
Montreal & Southern Counties Ry.	1	50	.....
Oshawa Ry.	1	50	32—0
Total	47		

Table VI—Recapitulation by Districts of Cars Ordered During 1925

	New England States	Eastern States	Central States	Southern States	Western States	Extra territorial	Total for United States	Total for Canada	Grand Total
Number of companies reporting new cars	7	21	36	12	5	2	83	11	94
City Service									
One-man cars, 28-ft. body	3	...	9	36	..	..	48	7	55
One-man cars with bodies longer than 28-ft.									
Single truck	...	5	17	22	10	..	54	2	56
Double truck	...	12	5	...	..	..	17	1	18
One-man, two-man cars	133	254	53	47	..	..	487	25	512
Two-man cars (surface)	...	13	120	20	66	20	239	6	245
Motor cars for rapid transit lines	60	...	100	...	..	..	160	..	160
Trailers	...	...	2	...	..	..	2	6	8
Service and miscellaneous cars	3	12	28	4	7	..	54	16	70
Total cars, city service	199	296	334	129	83	20	1,061	63	1,124
Interurban Service									
One-man, double-truck cars	...	...	2	...	1	..	3	..	3
One-man, two-man cars	...	23	18	17	..	..	58	12	70
Two-man cars	...	16	23	1	..	8	48	1	49
Trailers	22	10	8	...	..	..	40	..	40
Motor cars for train service	13	98	47	...	..	..	158	..	158
Express and freight cars	...	...	152	1	..	..	153	1	154
Miscellaneous cars	...	...	13	1	..	..	14	..	14
Total cars interurban service	35	147	263	20	1	8	474	14	488
Electric locomotives	4	26	11	...	1	3	45	2	47
Total cars and electric locomotives	238	469	608	149	85	31	1,580	79	1,659

900 Men Rush Rehabilitation Work on South Shore Road

MANY of the tasks in the rehabilitation work begun when the Chicago, South Shore & South Bend Railroad came under the control of Samuel Insull and associates had been completed on Dec. 1. Work in other phases of this program will continue as long as weather permits. More than 900 men were still engaged in this work on Dec. 1.

Some of the work which has been completed follows:

Ten miles of 70 and 80 lb. rail between Kensington and Hammond replaced with 100-lb. rail.

Entire track from South Bend to Kensington resurfaced with more than 300 cars of cinder ballast.

New angle bars installed at all track joints, approximately 11,000 pairs being used.

All block and other signals rebuilt, including wiring and controls.

New telephone lines for company communication installed.

Entire right-of-way cleared of undergrowth and weeds.

Portions of the rehabilitation work now under way are:

Rock ballasting of the section from Kensington to Hammond 60 per cent completed.

Steel trusses to support trolley wire on the above section in place. These trusses are mounted on the wooden poles.

Side tracks being extended and double-ended to take care of increase in freight business.

Freight stations enlarged and renewed.

Four new electric substations now under way and work is to start soon on a fifth.

New stations at Michigan City and South Bend in use and Gary and Tremont passenger stations being rebuilt.

Twenty-eight more passenger trains are being operated by the South Shore Line than at this time a year ago. Two of these are limited trains. The others are distributed between local and express service.

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34 per Cent of Passenger Cars Are Over Twenty Years Old

Less than Half of All Cars Now in Electric Railway Service Were Purchased in the Last Fifteen Years—Greater Number of New Cars Are Needed to Modernize Industry than Was Anticipated —Nationwide Survey More than Confirms Previous Estimates

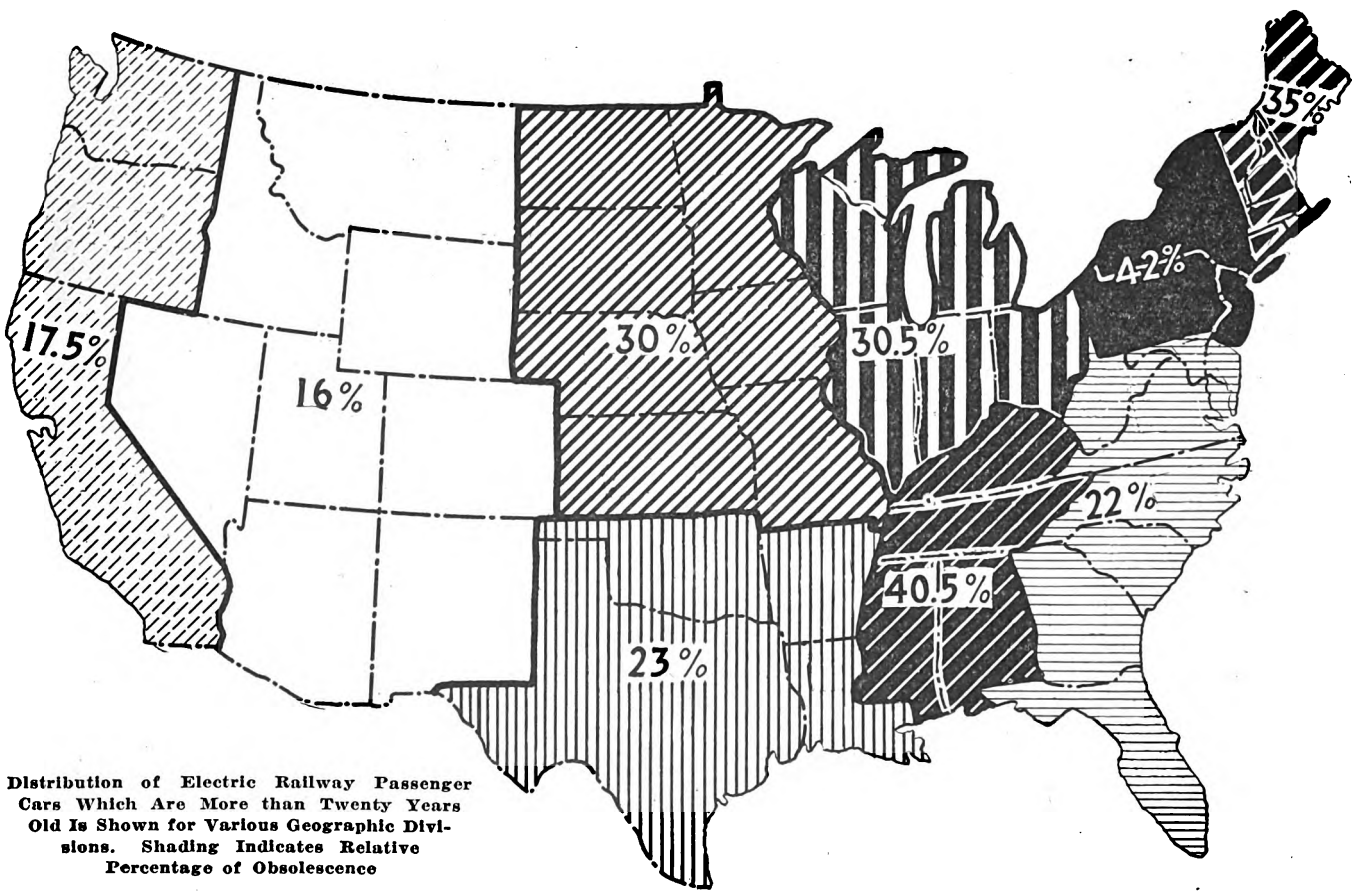
PURCHASE of more than 28,000 electric railway passenger cars is necessary in the near future if the industry is to be brought up to the high degree of efficiency necessary under present-day conditions. This is based only on replacement of those cars which are today twenty years of age or older. Many cars built in more recent periods may rightfully be considered obsolete equipment, so that an even greater number of new cars is needed to modernize fully electric railway rolling stock. This estimate would provide for replacement of obsolete cars only. It makes no provision for expansion of service which is known to be necessary in many localities if the patrons are to be given satisfactory accommodations.

CLASSIFICATION OF ELECTRIC RAILWAY PASSENGER CARS BY AGE

Age, Years	Number of Cars	Per Cent of Total
More than 25	11,740	14.2
20 to 25	16,345	19.8
15 to 20	16,945	20.5
10 to 15	13,740	16.8
5 to 10	12,440	15.1
Less than 5	11,240	13.6
	82,450	100.0

Purchase of such a large quantity of equipment involves the expenditure of a very large amount of money. If the average cost of a car is $10,000, which is undoubtedly low today, it means that $280,000,000 will be required. While such a task appears herculean, it is vital if the industry is to keep pace. For if the program of replacement is put off, the problem of providing new equipment of a character to attract patronage and win good will becomes cumulatively more difficult.

These statements are based on a survey made by this paper in the past few weeks, in which information has been obtained covering the industry in the entire United States. The results have more than confirmed previous estimates made by ELECTRIC RAILWAY JOURNAL, the American Electric Railway Association and others in position to analyze available statistics. The



Distribution of Electric Railway Passenger Cars Which Are More than Twenty Years Old Is Shown for Various Geographic Divisions. Shading Indicates Relative Percentage of Obsolescence

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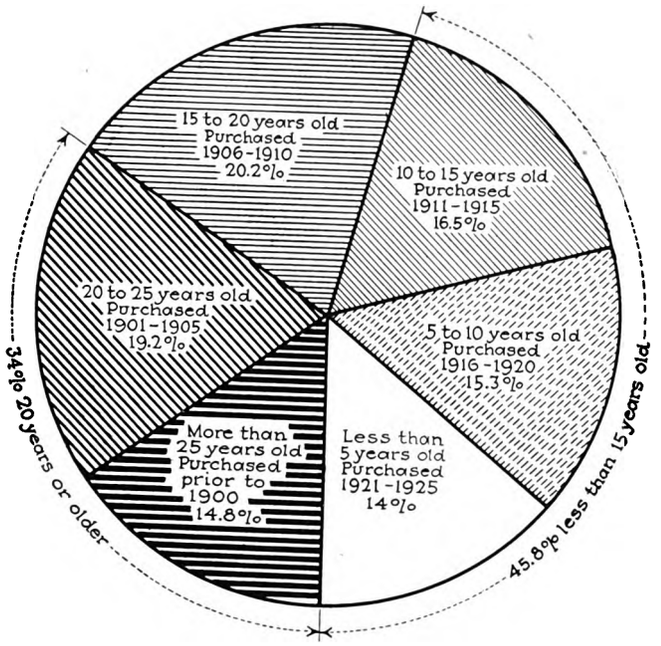


Inventory of City Cars Shows 34 per Cent That Are Twenty Years or More Old. In Addition 20.2 per Cent Have Seen Fifteen to Twenty Years of Service

more complete information on which the new figures are based shows the problem to be even more serious than had been anticipated in the earlier studies. In these estimates two general methods of approach have been used. One had for its object a determination of the deficiency in annual replacements, assuming a twenty-year life as a basis. The other was worked out by subtracting the purchases of new equipment each year since 1907 from the total number of cars owned. In this latter estimate the object was to find the number of passenger cars which were purchased previous to the development of many of the improvements which are now included in modern cars. These estimates, based upon figures compiled by the United States Census Bureau and statistics published annually in ELECTRIC RAILWAY JOURNAL, have indicated that there are 25,000 obsolete electric railway cars in service. An article covering this subject was published in ELECTRIC RAILWAY JOURNAL for Nov. 14, 1925, page 853.

SURVEY COVERED ENTIRE COUNTRY

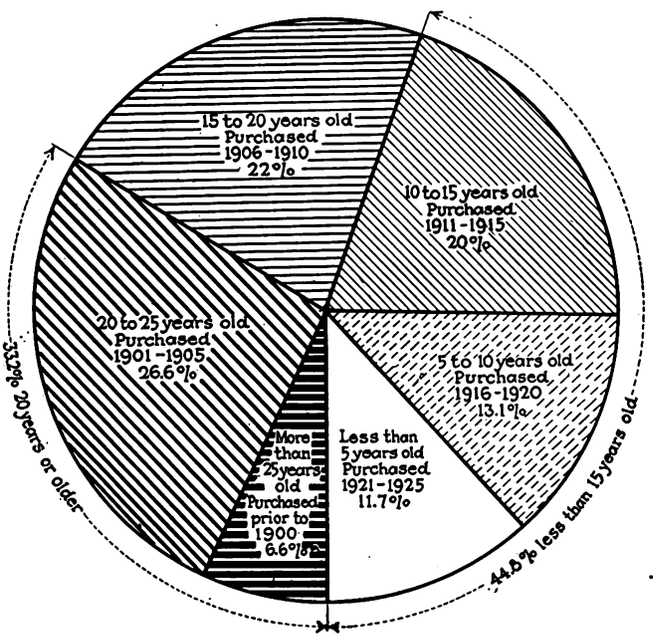
The more comprehensive analysis of the age of the equipment in various sections of the country has been obtained from a nation-wide survey published here for the first time. Questionnaires were sent to every electric railway property in the United States. The returns were supplemented by records compiled by the General Electric Company and the Westinghouse Electric & Manufacturing Company through personal contact of representatives of their division offices with the electric railway properties in various sections of the country.

The importance of directing attention to the replacement of obsolete equipment is strikingly brought out. Information obtained shows that 34 per cent of the total number of passenger cars are more than twenty years old. There are at present 82,450 passenger cars in the United States. This figure was compiled by ELECTRIC RAILWAY JOURNAL a year ago and published in the issue of March 7, 1925, page 368. Similar figures are collected annually for the McGraw Electric Railway Directory. Applying the above proportion of 34 per cent indicates that over 28,000 cars are more than twenty years old. Most of the major developments that are included in modern car design and construction have been made considerably inside of a twenty-year period. Consequently the number of cars which do not incorporate these developments is considerably above the figure given.

Further analysis of the age of cars by geographical districts and by class of service is shown in the table and on the accompanying map. It indicates the relative conditions in various parts of the country. In the Middle Atlantic States, comprising New York, New Jersey and Pennsylvania, it is seen that 42 per cent of the existing equipment is over twenty years old. In the East South Central States, comprising Kentucky, Tennessee, Alabama and Mississippi, 40.5 per cent of the equipment is shown to be more than twenty years old. The proportion ranges down through the remainder of the nine divisions into which the country is divided to 16 per cent for the Mountain States of Idaho, Colorado, Utah, Wyoming, New Mexico, Arizona, Nevada and Montana. It is of interest in passing to note that the sections which show the largest proportion of equipment over twenty years old correspond to those in which construction of electric railway lines progressed rapidly during the earlier years of the industry's history.

The per cents indicating total number of obsolete cars follow the condition of city rather than interurban equipment. This is primarily due to the greater number of city cars owned. In the table on page 27 are shown the per cents for both classes of service, divided between the various geographic sections. Here, it will be noted, the distribution of obsolete interurban cars varies considerably from the city distribution.

Returns from this survey have been compiled to show the relative age of passenger cars in five-year periods



Condition of Interurban Equipment Is Illustrated by This Diagram. the Largest Group of Cars Is from Twenty to Twenty-five Years Old

since 1900 and those purchased previous to that year. These have been further subdivided as between city and interurban cars. The results are shown graphically in the accompanying circle diagrams.

Under the city classification 14.8 per cent were pur-

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chased prior to 1900. Thus they were found to be more than 25 years old; 19.2 per cent fall in the group having an age of between twenty and 25 years. This makes a total of 34 per cent that have been in service for twenty years or longer. There is a group comprising 20.2 per cent which are from fifteen to twenty years old. These would also probably fall into an obsolete classification on the basis of the developments which have been made in car construction since they were built.

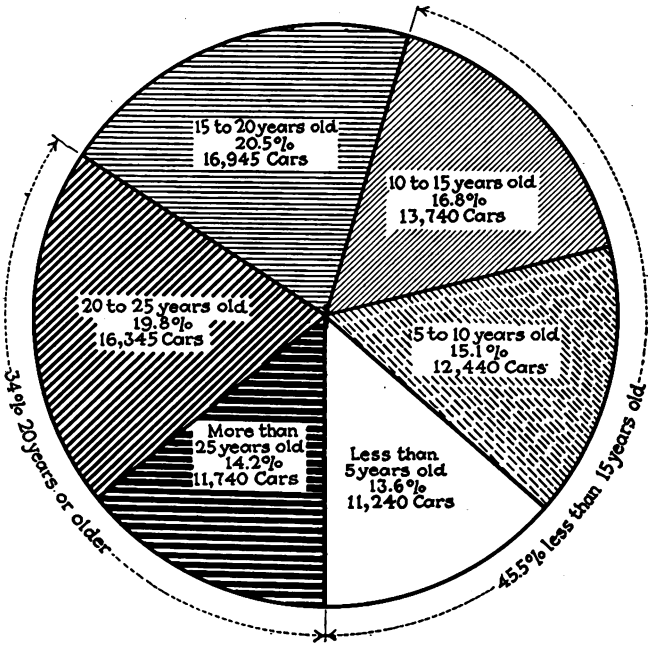
Of the cars which may be classed as more nearly modern, 16.5 per cent are from ten to fifteen years old, 15.3 per cent are five to ten years old and 14 per cent are less than five years old. This makes a total of 45.8 per cent of the total number of city cars that have been purchased within fifteen years.

A similar division has been made of the interurban cars—6.6 per cent were purchased previous to 1900 and are more than 25 years old; 26.6 per cent are twenty to 25 years old; 22 per cent fall into the group from fifteen to twenty years. Of the cars that are less than fifteen years old 20 per cent are between ten and fifteen years, 13.1 per cent fall between five and ten years and 11.7 per cent were purchased within the last five years.

An interesting check is obtained on the estimates made in preparing the chart on page 854 of the Nov. 14 issue, in which the conclusion that there are 25,000 obsolete cars was derived. In compiling the earlier chart the assumption was made that all cars purchased since 1907 are still in service. It was pointed out at that time that a certain number of comparatively modern cars had been destroyed by fire, accident and other causes. No method of approximating this number was available at that time. The present survey gives a basis for comparison with the original estimate. The diagram for city and interurban cars combined shows that 45.5 per cent of the total number of cars have been purchased within the last fifteen years. This is equivalent to approximately 37,500 cars on the basis of last year's estimate of 82,450 cars. The total number of cars purchased during these last fifteen years, as shown in the tabulation in another article in this issue for cars purchased each year since 1907, amounts to approximately 42,700. The difference of 5,200 cars represents those destroyed by fire, accident and other causes and those abandoned and not reported for various reasons.

Passenger Cars Over Twenty Years Old by Geographical Districts

Geographical District	Per Cent of Passenger Cars Over 20 Years Old — City	Interurban	Total
New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)	29.1	62.6	35
Middle Atlantic (New York, New Jersey, Pennsylvania)	42.6	36.1	42
East North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin)	30.4	30	30.4
West North Central (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas)	28.2	46.8	30
South Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida)	20.6	42	22
East South Central (Kentucky, Tennessee, Alabama, Mississippi)	40.8	34.5	40.5
West South Central (Arkansas, Louisiana, Oklahoma, Texas)	26.1	7.1	23
Mountain (Idaho, Colorado, Utah, Wyoming, New Mexico, Arizona, Nevada, Montana)	17.1	3.8	16
Pacific (Washington, Oregon, California)	17.1	23	17.5



Combined Interurban and City Cars Are Here Divided in Five-Year Periods. Cars Purchased Previous to 1900 Are Grouped Together. 34 per Cent of the Total Are at Least Twenty Years Old

Consideration of the combined diagram for both city and interurban cars gives a graphical presentation of the general condition of equipment. From this chart there are 14.2 per cent of the total number of passenger cars that are more than 25 years old. This amounts to 11,740 cars; 19.8 per cent fall in the group ranging from twenty to 25 years and aggregate 16,345 cars. Thus, the total of the combined city and interurban cars more than twenty years old amounts to 34 per cent, or 28,085. In addition there are 16,945 cars that are fifteen to twenty years old and amount to 20.5 per cent of the total. Unquestionably, most of the cars in this last group do not include modern developments in construction and design. Weight reduction, low floors, small wheels, higher grade materials and many other improvements have been introduced within comparatively recent years. Many developments have also been made in trucks, motors and control, air brakes, door controls and other items of equipment.

This analysis has been presented in considerable detail because of the importance of the subject from the standpoint of the future progress of the industry. It has been repeatedly pointed out that electric railway transportation has survived through a period of serious economic and operating handicaps. The condition of electric railway equipment today is in large measure attributable to the long series of events that have produced rising costs on the one hand and limited income on the other. But the industry today more clearly than ever before occupies a sound economic position as a fundamental necessity in modern community development. There has been a growing conviction that it is on the threshold of an era of renewed prosperity and usefulness. Attention to the subject of replacing obsolete equipment is shown by this analysis to be of paramount importance at this time.

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Heavy Traction Progress in 1925

Many Projects Completed, both in This Country and Abroad—Increasing Attention Being Paid to Electric Operation on Trunk Lines

MORE progress in steam railroad electrification was made in 1925 than for any year since 1919. In fact, the track equipped for electric operation was 20 miles more than the entire electrifications in 1920 to 1925, inclusive. The work was done by five roads. The Virginian Railway easily stands at the head of the list. There the loads to be hauled are of the heaviest character. The entire installation has been done in a manner not only to replace the steam service, but to increase the capacity largely. That the result has been accomplished is shown in the article published in this paper on Oct. 3, following inauguration of the system between Mullins and Clarks Gap, W. Va. At that time completion of the system to Roanoke had been deferred, since a question had arisen regarding ownership and operation of the property. Since then the objections have been cleared away and it is considered probable that the project will be completed with the present year.

Several Existing Systems Extended

The Norfolk & Western Railway also added materially to its electrified mileage during the year. The initial electrification of this road was completed some ten years ago. Since then the electrified mileage has been added to year by year, thus increasing the utility of the electrification. Both this road and the Virginian use the same electrical system, 11,000 volts, 25 cycles, single phase. As they operate in the same territory, carry the same class of freight and are financially connected the interchangeability of equipment is certain to be of great advantage.

Of an entirely different character is the electrification of the Staten Island Rapid Transit system. This road, which is a subsidiary of the Baltimore & Ohio Railroad, handles an extensive passenger business, largely to and from the ferries to Brooklyn and Manhattan. The installation has been planned so that in case the city of New York connects Staten Island with Brooklyn by means of a tunnel, the trains can be operated over the Brooklyn-Manhattan Transit Corporation's subway system. Accordingly the 600-volt direct-current system is used. Electrification of the Staten Island line already has made a marked improvement in transportation in the Borough of Richmond. Train speeds have been increased and more service is being operated than was feasible with locomotive-hauled steam trains.

The Long Island Railroad's 600-volt direct-current system was extended to Babylon during the year, a distance of 27 miles. This converts a large portion of the Montauk Division to electric operation. It has made possible the operation of through trains to New York, eliminating the transfer at Jamaica.

The New Haven Railroad inaugurated electric operation on the Danbury branch, a 25-mile line connecting South Norwalk on the main line with Danbury. The purpose of the electrification was largely to eliminate the facilities for handling steam locomotives at the ends of the line. Practically all operation on the New Haven system west of New Haven, both freight and passenger, is now handled by electric locomotives and electric motor cars. The 11,000-volt, single-phase system which is used on the main line has been adopted.

Progress has been made on the Illinois Central electrification in Chicago, although it will not be in service for some months.

Foreign Electrifications Progressing

Many electrification plans are being pushed in Europe. The Austrian government has appropriated some $18,000,000 for electrifying the Tyrolean Railroad between Salzburg and Brudenz. In Germany work is nearing completion on the Munich-Garmisch line. Financial credits have been secured for the conversion of the Munich-Rosenheim-Kufstein line. A number of other projects are planned for this year.

Progress in Switzerland has been rapid since it was decided about a year ago to accelerate the electrification program so that practically all the main lines of the Swiss Federal Railways will be electrified within the next two years.

The Midi Railway in southern France is carrying to completion an extensive program of electrification. About 300 miles are now in service, making it by far the most pretentious French electric railroad system at present operating.

The Southern Railway of England began operation on 100 miles of track out of a total of 250 that are being electrified. This is a suburban system operating a number of lines radiating out of London.

The Japanese Government Railways has begun an extensive program of electrification in order to increase the capacity of its lines. The first step in this is the equipment of the Tokio-Kobe line as far as Kozu, a distance of 50 miles.

The Paulista Railway in Brazil is extending 25 miles from Tatu to Rio Clara. The Mexican Railway electrification is being extended 17 miles over the Maltrate incline. Various other projects have been inaugurated during the year in foreign countries.

Projects Under Contemplation

During the year the Pennsylvania Railroad announced that it will electrify its New York-Washington line. The first step in this will be the section from Philadelphia to Wilmington. The route is already electrified from Pennsylvania Station, New York, to Manhattan Transfer and from North Philadelphia to West Philadelphia. It will be necessary to standardize the contact system, as the former installation is at 600 volts direct current while the latter is at 11,000 volts, single phase, alternating current.

Lines of the New York Central on the west side of Manhattan Island must be electrified at once, according to the latest court decision. Though this improvement is desirable, so much is involved in the way of grade separation that it will undoubtedly be some time before the work can be undertaken.

The status of electrification has been changed somewhat by the successful construction of oil-electric locomotives driven by Diesel engines. Several of these have been tried out during the year, and show great possibilities for handling traffic where there would not be sufficient density to justify installation of full electric equipment. This should simplify the electrification problem, particularly where there are many unimportant feeder lines to be considered.

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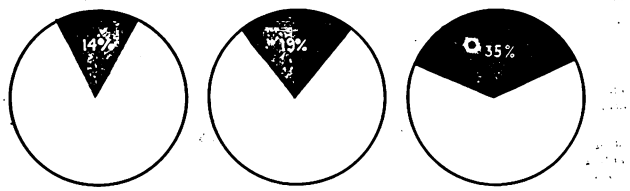
Bus Operation by Electric Railways Broke All Records in 1925

More Companies Inaugurated Bus Service During the Past Twelvemonth than in Any Previous Year—The Number of Buses Operated More than Doubled—Purchases of New Passenger and Service Equipment Were Greater than Ever Before

PROGRESS made in bus operation by practically all the electric railways in the United States and Canada during the year just ended surpasses by a wide margin that of any previous twelve-month period. This is shown by statistics for 1925 compiled from information gathered from these companies by ELECTRIC RAILWAY JOURNAL. When statistics of bus operation by electric railways for 1924 were published in the Jan. 3, 1925, issue of this paper, showing that the number of companies furnishing such service had increased one-third during that year and that the number of buses owned had doubled, the rapidity of this development seemed remarkable. During 1925, however, the expansion was at an even greater rate. Railway companies operating buses increased in number from 156 to 280,



Proportion of Electric Railways Operating Buses to Total Number of Companies at the First of Each Year

Automotive Service Equipment Ordered by Railways During 1925

Name of Railway	No.	Type of Chassis	Body Builder
Connecticut			
Connecticut Co	6	1 Ton Truck	Ford
	1	1 Ton Truck	Dodge
	2	½ Ton Truck	Ford
	1	3½ Ton Truck	White
Maine			
York Utilities Co	1	Reo Speed Wagon Chassis	.....
Massachusetts			
Eastern Mass. St. Ry	3	1 Ton Truck	Ford
	1	1½ Ton Truck	Cadillac
Springfield St. Ry	1	2 Ton Truck	Federal
District of Columbia			
Washington Ry. & Elec. Co	8	Service Truck	.....
New Jersey			
Trenton & Mercer County Trac. Corp	3	1½ Ton Truck	Mack
New York			
Black River Trac. Co	1	Snow Plow	G. M. C.
Brooklyn City R.R.	1	5 Ton Trans. Wrecker	White-Hoover
	1	2 Ton Line Truck	Coml.
	3	2½ Ton Line Truck	White-Trenton
	3	3½ Ton Line Truck	White-Trenton
	2	2 Ton Track Truck	White-Hoover
	3	3½ Ton Track Truck	White-Hoover
New York State Rys	1	1 Ton Truck	Ford
	2	3½ Ton Truck	Brockway
	2	3½ Ton Truck	Brockway
	3	1½ Ton Truck	Brockway
Schenectady Ry	1	2½ Ton Truck	Mack
	1	5 Ton Universal Crane Mounted on Mack Chassis	.....
United Trac. Co	2	5½ Ton Snow Plow	Walter
	1	2 Ton Truck	Ford
Pennsylvania			
Buffalo & Erie Ry	2	6 Ton Truck	White
Philadelphia Rapid Transit Co	6	1 Ton Truck	Ford
	8	2½ Ton Truck	Mack
	1	Roadster	Ford
	1	1 Ton Truck	Ford
	1	5 Ton Truck	G. M. C.
	3	2½ Ton Truck	G. M. C.
	2	3½ Ton Trailer	P. R. T.
Pittsburgh Rys	4	5 Ton Tower Truck	Mack
	3	5 Ton Snow Plow	Walter
	1	5 Ton Universal Crane	Mack
West Penn Rys	1	3½ Ton Tower Truck	White
West Virginia			
Norfolk & Western Ry	1	5 Ton Truck	White
	1	3 Ton Truck	International
	1	2 Ton Truck	White
	1	Speedwagon	Reo
Illinois			
Aurora Plainfield & Joliet Ry	1	2 Ton Truck	Pierce Arrow
Chicago & Joliet Elec. Ry	1	Tractor	Fordson
Chicago North Shore & Milwaukee R.R.	2	5 Ton Tractor	White
	1	2½ Ton Truck	White
Chicago Rapid Transit Co	2	½ Ton Truck	Ford
	1	1 Ton Truck	Yellow Coach
Chicago Surface Lines	2	5 Ton Trucks	White-Press Sons
	1	3 Ton Truck	Auto Car-Voltz Bros.
	10	3 Ton Truck	White-C. S. L.
	1	2½ Ton Truck	Mack-Press Sons
East St. Louis Ry	1	1½ Ton Truck	Dodge-Graham
	1	Tower	.....
Illinois Traction, Inc	22	1 Ton Truck	Ford
Indiana			
Beech Grove Trac. Co	1	1 Ton Truck	Ford
Hammond, Whiting & East Chicago Ry	1	Tower Truck	White
Kentucky			
Louisville Ry	1	1 Ton Truck	Ford
	1	2 Ton Tower Truck	Dodge-Graham
Michigan			
Dept. of St. Rys., Detroit	28	Service Truck	.....
Milwaukee Elec. Ry. & Lt. Co	2	3 Ton Exp. Truck	Int. Harvester-(Stoughton)
	37	Truck	White-Sterling
Minnesota			
Duluth St. Ry. Co	1	2 Ton Tower Truck	White
	1	1½ Ton Dump Truck	White
	1	1 Ton Truck	Ford
Mesaba Ry. Co	1	Gas Tank Truck	White Chassis
	1	1½ Service Truck	Graham
Twin City Rapid Transit Co	3	1 Ton Trucks	Ford
Missouri			
United Rys. Co. of St. Louis	2	2½ Ton Truck	White-U.R. Co.
	1	1 Ton Truck	Ford
	1	½ Ton Truck	Ford
	1	5 Pass. Auto	.....
Ohio			
Cleveland Ry	3	¾ Ton Truck	White-Klein
Southern Ohio Public Service Co.	1	5 Ton Truck	White
Florida			
Jacksonville Trac. Co	1	1½ Ton Truck	Int. Harvester Co.
Georgia			
Athens Ry. & Elec. Co	1	1 Ton Truck	Ford
Columbus Elec. & Pwr. Co	1	1 Ton Truck	Ford
Georgia Ry. & Pwr. Co	18	3½ Ton Truck	.....
Tennessee			
Jackson Ry. & Lt. Co	2	Service Truck	.....
California			
Los Angeles Ry. Corp	10	Truck	.....
Municipal Ry., San Francisco	1	Truck	Reo
Kansas			
United Trac. System	2	2 Ton Truck	Reo
Texas			
Dallas Ry. Co	1	2 Ton Truck	White
Wichita Falls Trac. Co	1	Truck	Ford
	1	Truck	Dodge
Washington			
Grays Harbor Ry. & Lt. Co	3	5 Ton Dump Truck	.....
	1	5 Ton G. M. C.	.....
	2	White	.....
Seattle Munic. Ry	1	3½ Ton Truck	G. M. C.
	2	1 Ton Truck	Ford
Canada			
B. C. Elec. Ry. Co. Ltd	2	4 Ton Dirt Truck	Leyland-Co. Shop
	2	3 Ton Dirt Truck	Leyland-Co. Shop
	2	2½ Ton Truck	Federal-Co. Shop
	1	1 Ton Truck	Federal-Co. Shop
Niagara, St. Catherines & Toronto Ry	1	2½ Ton Truck	Leyland
Ottawa Elec. Rys. Co	1	2 Ton Truck	Federal
Quebec Ry. Lt. & Pwr. Co	1	Tower Truck (Rep.)	Local
Winnipeg Elec. Co	1	Gas-Elec. Snow Plow	Cummings
Total	284		

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Bus Operation by Electric Railways and Subsidiary Companies

Connecticut

Connecticut Co	103
Danbury & Bethel St. Ry	4
Groton & Stonington St. Ry	3
Hartford & Springfield St. Ry	21
*Lordship Ry	4
New Haven & Shore Line Ry	10
Waterbury & Milldale Tramway	3

Maine

Central Maine Power Co	1
York Utilities Co	6

Massachusetts

Boston Elevated Ry	156
Boston & Worcester St. Ry	7
Eastern Massachusetts St. Ry	59
Fitchburg & Leominster St. Ry	3
Gardner-Templeton St. Ry	1
Holyoke St. Ry	3
Interstate St. Ry	6
Middlesex & Boston St. Ry	33
New Bedford & Onset St. Ry	5
Plymouth & Brockton St. Ry	1
Springfield St. Ry	25
Union St. Ry	10
Worcester Consolidated St. Ry	12

New Hampshire

*Laconia St. Ry	4
*Portsmouth Electric Ry	8
Nashua St. Ry	3

Rhode Island

Newport Electric Corporation	19
*Newport & Providence Ry	6
United Electric Rys	58

Vermont

*Twin State Gas & Electric Co	3

Delaware

Wilmington & Philadelphia Traction Co	45

District of Columbia

Capital Traction Co	26
Washington Ry. & Electric Co	44
Washington & Old Dominion Ry	1
Washington-Virginia Ry	11

Maryland

Cumberland & Westernport Electric Ry	3
Potomac Edison Co	50
United Rys. & Electric Co	81

New Jersey

Coast Cities Railway	25
Cumberland Traction Co	2
Millville Traction Co	7
Morris County Traction Co	4
New Jersey Inter-Urban Co	4
Ocean City Electric Railroad	1
Public Service Ry	809
Trenton & Mercer County Traction Corporation	27

New York

Auburn & Syracuse Electric R.R	4
Binghamton Ry	3
Black River Traction Co	15
Brooklyn-Manhattan Transit Corporation	10
Empire State Railroad	6
Geneva, Seneca Falls & Auburn R.R	3
International Ry	34
Jamestown St. Ry	12
*Newburgh Public Service Co	22
New York Rys	1
New York State Rys. (Rochester)	36
New York State Rys. (Syracuse)	15
New York State Rys. (Utica)	7
Niagara Gorge R.R	5
Olean, Bradford & Salamanca Ry	1
*Port Jervis Transit Co	2
Rochester & Syracuse R.R	1
Syracuse & Eastern R.R	1
Third Avenue Ry. System	8
United Traction Co. of Albany	28
*Walkill Transit Co	7

Pennsylvania

Altoona & Logan Valley Electric Ry	11
Beaver Valley Traction Co	8
Chambersburg & Shippensburg Ry	2
Citizens Traction Co	12
Conestoga Traction Co	2
Erie Rys	4
Johnstown & Somerset Ry	1
Johnstown Traction Co	9
Lackawanna & Wyoming Valley R.R	4
Lewiston & Reedsville Electric Ry	2
Lehigh Traction Co	10
Lehigh Valley Transit Co	5
Northumberland County Ry	2
Philadelphia & Westchester Traction Co	3
Philadelphia & Western Ry	2
Philadelphia Rapid Transit Co	219
Pittsburgh Harmony Butler & New Castle Ry Pittsburgh, Mars & Butler Ry	8
Pittsburgh Rys	22
Reading Transit & Light Co	3
Schuykill Ry	8
Scranton Ry	4
Westmoreland County Ry	5
Westside Electric St. Ry	2
Wilkes-Barre Ry	14
Williamsport Passenger Ry	3
York Rys	5
West Chester St. Ry	33

Virginia

Newport News & Hampton Ry. Gas & Elec. Co.	5
Roanoke Ry. & Electric Co	5
Virginia Electric & Power Co	124

* Denotes company which operates buses only.

West Virginia

Charleston Interurban R.R	3
Monongahela West Penn Public Service Co	9
Ohio Valley Electric Ry	9
Princeton Power Co	1
Wheeling Public Service Co	4
Wheeling Traction Co	2

Illinois

Aurora, Elgin & Fox River Electric Co	3
Central Illinois Public Service Co	5
Chicago & Joliet Electric Ry	8
Chicago, North Shore, & Milwaukee R.R	46
Chicago & West Towns Ry	17
East St. Louis Ry	11
East St. Louis & Surburban Ry	6
Evanston Ry	5
Illinois Power Co	8
Illinois Power & Light Corp. (Bloomington)	6
Illinois Power & Light Corp. (Champaign)	9
Illinois Power & Light Corp. (Danville)	4
Illinois Power & Light Corp. (Decatur)	15
Illinois Power & Light Corp. (Galesburg)	7
Illinois Power & Light Corp. (Peoria)	9
Illinois Power & Light Corp. (Quincy)	8
Illinois Traction System (Valley Division)	4
Illinois Traction System (Main Line Division)	2
*Joliet, Plainfield & Aurora Transp. Co	5
Rockford City Traction Co	3
Rockford & Interurban Ry	6
Tri-City Ry. of Illinois	2

Indiana

Chicago, South Bend & Northern Indiana Ry	19
Gary Rys	68
Indianapolis & Cincinnati Traction Co	4
Indianapolis St. Ry	29
Indiana Service Co	5
Interstate Public Service Co	41
Northern Indiana Power Co	2
Southern Indiana Gas & Electric Co	6
Terre Haute, Indianapolis & Eastern Trac. Co.	10
Union Traction Co	17

Iowa

Des Moines City Ry	3
Des Moines & Central Iowa R.R	3
Dubuque Electric Co	7
Fort Dodge Des Moines & Southern R. R	15
Iowa Southern Utilities Co. (Burlington)	4
Iowa Southern Utilities Co. (Centerville)	3
Mississippi Valley Electric Co	5
Tama & Toledo R.R	4
Waterloo, Cedar Falls & Northern Ry	9

Kentucky

Kentucky Traction & Terminal Co	7
Louisville Ry	17

Michigan

City of Detroit—Dept. of St. Rys	161
Detroit United Ry	180
Grand Rapids Ry	10
Michigan R.R	14
Michigan Electric Ry	32
Muskegon Traction & Lighting Co	2
Saginaw Transit Co	28

Minnesota

Duluth St. Ry	8
Mesaba Ry	9
Twin City Rapid Transit Co	91

Missouri

Kansas City, Clay County & St. Joseph Ry	16
Kansas City Ry	69
Missouri Power & Light Co	3
Springfield Traction Co	17
St. Louis Electric Terminal Ry	6
United Rys. of St. Louis	40
*West Missouri Power Co	2

Ohio

Cincinnati, Lawrenceburg & Aurora El. St. Ry.	4
City of Ashtabula—Division of St. Rys	3
Cleveland Ry	101
Columbus, Urbana & Western Electric Ry	4
Community Traction Co	3
Dayton, Springfield, & Xenia Southern Ry	2
Indiana, Columbus & Eastern Traction Co	36
Northern Ohio Traction & Light Co	150
Ohio Service Co	5
Penn-Ohio Electric Co	44
Southern Ohio Public Service Co	46
Springfield Ry	1
*Stark Electric R.R	6
Steubenville, East Liverpool & Beaver Valley Traction Co	2
Youngstown & Ohio River R.R	4
Youngstown & Suburban Ry	17
Youngstown Municipal Ry	41

Wisconsin

Madison Rys	6
Milwaukee, Electric Ry. & Light Co	121
Wisconsin Gas & Electric Co	9
Wisconsin Power & Light Co	44
Wisconsin Public Service Corporation	3
Wisconsin Valley Electric Co	12

Alabama

Birmingham Electric Co	4
*Selma Electric Rys	3

Arkansas

Arkansas Central Power Co	9
Hot Springs St. Ry	2
Intercity Terminal Ry	6

Florida

Key West Electric Co	4
Tampa Electric Co	22

Georgia

Augusta-Aiken Ry. & Electric Corporation	1
Columbus Electric & Power Co	16
*Fairburn & Atlanta Ry. & Electric Co	4
Georgia Ry. & Power Co	15
Savannah Electric & Power Co	2

Louisiana

Baton Rouge Electric Co	3
New Orleans Public Service, Inc	19

Mississippi

*Meridian Light & Ry. Co	10
Mississippi Power & Light Co	1

North Carolina

Asheville Power & Light Co	2
Carolina Power & Light Co	3
Durham Public Service Co	11
Southern Public Utilities Co	2
Tidewater Power Co	3

South Carolina

South Carolina Gas & Electric Co	14

Tennessee

Nashville Interurban Ry	1
Tennessee Electric Power Co	5
Union Traction Co	1

Arizona

Tucson Rapid Transit Co	5

California

Bakersfield & Kern Electric Ry	5
Eureka St. Ry	1
Key System Transit Co	27
Los Angeles Ry	149
Market St. Ry	1
Municipal Ry. of San Francisco	13
Pacific Electric Ry	145
Pacific Gas & Electric Co	7
Peninsular Ry	7
San Diego Electric Ry	12
San Francisco-Sacramento R.R	1
San Jose R.Rs	1
Santa Barbara & Suburban Ry	5
Stockton Electric Ry	3
Union Traction Co	3

Colorado

Denver & Interurban R.R	4
Denver Tramway	3

Idaho

Boise Street Car Co	2

Kansas

Arkansas Valley Interurban Ry	3
Kansas Electric Power Co	6
Kansas City, Leavenworth & Western Ry	6
Topeka Ry	11
*Salina St. Ry	1
United Power & Light Corporation	2
Wichita R.R. & Light Co	13

Nebraska

Lincoln Traction Co	1
Omaha & Council Bluffs St. Ry	5

New Mexico

City Electric Co	1

Oklahoma

Northeast Oklahoma R.R	5
*Okmulgee Traction Co	3
Oklahoma Ry	7
Oklahoma Union Ry	26
Tulsa St. Ry	14

Oregon

Portland Electric Power Co	22
Southern Pacific System (Salem)	3

South Dakota

Sioux Falls Traction System	14

Texas

Abilene Traction Co	2
Eastern Texas Electric Co	2
Houston Electric Co	23
Marshall Traction Co	1
*Nueces Ry	2
Rio Grande Valley Traction Co	5
San Antonio Public Service Co	30
Texas Electric Ry	6
Wichita Falls Traction Co	2

Utah

Utah-Idaho Central R.R	2
Utah Light & Traction Co	1

Washington

Grays Harbor Ry. & Light Co	3
Lewiston-Clarkston Transit Co	1
Pacific Northwest Traction Co	28
Puget Sound Electric Ry	16
Puget Sound International Ry. & Power Co	35
Seattle Municipal Ry	24
Seattle & Rainier Valley Ry	2

Canada

British Columbia Electric Ry	20
Grand River Ry	3
Hydro-Electric Rys	8
London St. Ry	1
Montreal Tramways	26
Nova Scotia Tramways & Power Co	2
Ottawa Electric Ry	7
Quebec Ry., Light & Power Co	9
Toronto Transportation Commission	40
Windsor, Essex & Lake Shore Rapids Rys	2
Winnipeg Electric Ry	22

Panama

Panama Electric Co	2

Porto Rico

Ponce Electric Co	3

Hawaiian Islands

Honolulu Rapid Transit Co	6

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a gain of 124, or approximately 80 per cent. Of this number about twenty small properties have entirely, or almost entirely, given up their rail service and operate only buses.

An increase occurred in the number of buses owned from 2,462 to 5,358, a gain of 2,896, or 117 per cent. Orders for new equipment placed in 1925 were more than twice those of the year before.

Looking back to the figures published in the statistical issues of this paper for 1924, it will be seen that the number of bus operating companies was 121, and the number of buses slightly more than 1,200. The next year the number of companies was 156, an increase of 29 per cent, and the number of buses was 2,462, an increase of 105 per cent. Figures for 1925 given in the preceding paragraph show a considerably larger increase, and thus break all records. The proportion of electric railways operating buses to the total number of companies is shown graphically in an accompanying chart.

While the figures show that approximately 35 per cent of the railways have undertaken bus operation, the actual number of automotive vehicles is small in comparison to the number of electric railway cars, there being only some 5,000 of the former as against 82,000 of the latter, or about 6 per cent. It is estimated that passengers carried annually by electric railway buses number approximately 800,000,000, while those carried by the rail lines are about 16,000,000,000.

Route mileage of bus lines compares favorably with that of the car lines. Bus routes total approximately 13,000 miles, as against 46,000 miles of electric railway single track. A considerable part of the railway mileage, however, is double track, so that the total mileage of rail route is less than the total single-track mileage. The difference between the ratio of the number of vehicles, which is 16 to 1, and the ratio of the number of miles of route, which is about 2½ to 1, is accounted for by the fact that buses are more often used on light traffic lines in outlying sections, where the service is infrequent, than on heavy urban lines, where the number of vehicles per mile of track is large. These comparisons are graphically shown in accompanying charts.

It is interesting to note that a large portion of the 13,000 miles of bus route represents new service given by the railways, compared to which the

Buses Ordered by Railways During 1925

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
Connecticut					
Connecticut Company	35	2	Mack	Mack	29
		4	Mack	Kuhlman	29
		3	White	Kuhlman	29
		2	White	Hoover	29
		24	Yellow Coach	Yellow Coach	29
Hartford & Springfield St. Ry.	7	3	Mack	Mack	29
		2	Yellow Coach	Patterson	25
		2	Graham	Patterson	16
Waterbury & Milldale Tramway	3	1	White	Kuhlman	24
		1	White	Kuhlman	25
		1	White	Kuhlman	29
Maine					
Central Maine Power Co.	1	1	White	.....	25
York Utilities Co.	2	2	G. M. C.	Wisbach	21
Massachusetts					
Boston Elevated Railway	92	19	White	Brown	25
		11	White	Brown	29
		9	Mack	Mack	25
		22	Mack	Mack	29
		18	International	Niagara	25
		4	Yellow Coach	Yellow Coach	29
		1	Fageol	Fageol	29
		8	Miscellaneous	.....	....
Boston & Worcester St. Ry.	7	7	Mack	Mack	29
Eastern Mass. St. Ry.	16	5	Fageol	Fageol	31
		4	Fageol	Fageol	29
		6	Int. Harvester	Int. Harvester	29
		1	White	Brown	29
Gardner-Templeton St. Ry.	1	1	Dodge	Graham	20
Middlesex & Boston St. Ry.	21	21	White	Bender	29
New Bedford & Onset St. Ry.	1	1	Reo	Boston Body Co	21
Plymouth & Brockton St. Ry.	1	1	Reo	Boston Body Co	20
Springfield St. Ry.	16	1	Federal	Brown	25
		3	Garford	Wason	21
		1	Garford	Garford	25
		8	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	21
Union Street Railway	7	2	Mack	Mack	21
		1	Pierce Arrow	Brown	18
		3	Pierce Arrow	Brown	26
		1	Pierce Arrow	Brown	29
Worcester Consolidated St. Ry.	12	2	White	Brown	25
		1	Pierce	Brown	29
		2	Mack	Mack	29
		4	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	25
New Hampshire					
Laconia St. Ry.	4	4	Reo	Boston Body Co	21
Portsmouth Electric Ry.	8	8	White	Brown	29
Rhode Island					
Newport Electric Corp.	11	5	Fageol	Fageol Parlor Car	29
		2	Fageol	Fageol Delux St. Car	29
		4	Fageol	Fageol St. Car	29
Newport & Providence Ry.	6	....	.....	.....	....
United Electric Rys.	12	2	Yellow Coach	Yellow Coach	29
		1	White	Brown	29
		5	Reo	Fitzjohn	21
		4	Yellow Coach	Yellow Coach	29
District of Columbia					
Capital Traction Co.	15	8	Yellow Coach	Yellow Coach	21
		2	Yellow Coach	Yellow Coach	21
		3	Reo	Reo	16
		2	Reo	.....	21
Washington Ry. & Elec. Co.	24	7	Graham	Hoover	20
		7	Six Wheel Co	Am. M. B. Corp.	27
		6	Yellow Coach	Yellow Coach	27
		2	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
Washington & Old Dominion Ry.	1	1	Graham	Graham	21
Washington-Virginia Ry.	9	9	Fageol	Fageol	29
Maryland					
Cumberland & Westernport Elec. Ry.	3	3	White	Hoover	21
United Ry. & Elec. Co.	9	6*	5th Ave.	5th Ave.	55
		2	Yellow Coach	Yellow Coach	29
		1	Yellow Coach	Yellow Coach	23
New Jersey					
Morris County Traction Co.	3	2	G. M. C.	.....	14
		1	Reo	.....	30
Ocean City Elec. R.R.	1	1	Reo	Reo	15
Public Service Railway	483	333	Gas-electric	Yellow Coach	29
		68	White	.....	29
		44	Mack	.....	25
		3	Fageol	.....	29
		3	Yellow Coach	.....	29
		32	Miscellaneous	.....	....
Trenton & Mercer County Traction Co.	8	6	Fageol	Fageol	29
		2	Mack	Mack	29
New York					
Auburn Syracuse Elec. Ry.	4	4	Dodge	Graham	21
Black River Traction Co.	3	3	G. M. C.	Railway Shops	16
Empire State R.R.	6	6	Dodge	Graham	21
New York State Rys. (Rochester)	12	1	White	Bender	22
		1	White	Brown	29
		8	White	Bender	29
		1	Mack	Mack	25
		1	Studebaker	Autobody	21
New York State Rys. (Syracuse)	8	4	Brockway	Bender	25
		3	White	Bender	25
		1	Mack	Bender	25
New York State Rys. (Utica)	5	1	Mack	Bender	25
		1	Mack	Bender	25
		2	White	Bender	25
		1	Reo	Reo	21
Olean, Bradford & Salamanca Ry.	1	1	Clydesdale	Miller	16
Rochester & Syracuse R.R.	1	1	Larabee	Whitfield	14
Syracuse & Eastern R.R.	1	1	Reo	Patterson	25
United Traction Co.	21	18	Fageol	Fageol	29
		3	Mack	Mack	25

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mileage of rail route entirely replaced by bus lines is small. During 1925 extensions to bus routes operated by electric railways totaled about 3,500 miles. Of this less than one-tenth represented replacement of car service. City bus routes gained about 900 miles. New intercity routes totaled some 2,400 miles, while touring and sightseeing lines added another 140 miles. On the other hand, operation of about 12 miles of city bus route was abandoned by the railways and nearly 150 miles of interurban route.

Details of the developments during the year have been published in this paper from time to time and can only be summarized briefly here. Electric railways which added more than 200 buses during the year are the Public Service Railway, Newark, N. J., and the Philadelphia Rapid Transit Company. How the development of coordinated transportation in New Jersey has resulted in the former company becoming the largest bus operator in the United States was told in the issue of this paper for Nov. 28. Gas-electric bus operation inaugurated during the early part of the year by the Philadelphia Rapid Transit Company has been discussed widely and is being observed with interest by the industry.

One of the largest increases in 1925 in the number of buses owned by an electric railway occurred in Michigan, where the Detroit United Railways acquired 180 such vehicles. For the purpose of carrying its interurban passengers downtown from transfer stations on the outskirts of the city, this railway bought 40 single-deck Yellow coaches. An article on this subject was published in ELECTRIC RAILWAY JOURNAL for May 2, 1925. Purchase of competing independent bus lines was largely responsible for the remainder of the 180 buses acquired by the D. U. R.

In Norfolk, the Virginia Electric & Power Company, formerly the Virginia Railway & Power Company, purchased 102 competing buses and 22 new vehicles, making a total of 124. The Cleveland Railway has ordered more than 100 new buses. At present not all of these have been delivered and the full service has not been established. Ninety-two buses were added to the fleet operated by the Boston Elevated Railway. The Northern Ohio Traction & Light Company has greatly extended its bus service in the Akron and Canton districts, practically doubling the number of such vehicles in service. One of the pio-

Buses Ordered by Railways During 1925—(Continued)

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
Pennsylvania					
Beaver Valley Traction Co.	2	1	Pierce Arrow	Thompson	25
		1	Mack	Mack	25
Chambersburg & Shippensburg Ry.	2	2	Garford	Garford	17
Citizens Traction Co.	4	4	Fageol	Fageol	29
Erie Railways	4	4	Yellow Coach	Yellow Coach	29
Lehigh Traction Co.	10	10	Mack	Mack	25
Lehigh Valley Transit Co.	5	5	Mack	Mack	25
Pittsburgh, Harmony, Butler & New Castle Ry.	3	1	Reo	Reo	21
		2	Reo	Reo	17
Schuylkill Ry.	4	4	Reo	Paterson	18
Scranton Ry.	2	2	Dodge	Graham	20
Westmoreland County Ry.	3	1	Fageol	.....	29
		1	Garford	.....	23
		1	Dodge	.....	15
Westside Electric St. Ry.	2	2	Mack	Mack	25
Virginia					
Roanoke Ry. & Elec. Co.	3	3	Dodge	Graham	17
Virginia Elec. & Power Co.	22	7	Reo	Reo	21
		5	White	Bender	23
		10	Mack	Amco	27
West Virginia					
Charleston Interurban R.R.	3	3	Menominee	Thompson	25
Ohio Valley Elec. Ry.	7	3	Graham	.....	17
		4	Graham	.....	21
Monongahela-West Penn Pub. Serv. Co.	2	1	Fageol	Fageol	22
Wheeling Traction Co.	2	1	Yellow Coach	Yellow Coach	21
		2	Fageol	.....	29
Illinois					
Aurora Elgin & Fox River Elec. Co.	3	2	White	Schaefer	25
		1	Fageol	Fageol	30
Central Illinois Pub. Serv. Co.	5	2	Dodge	Graham	17
		3	Reo	Reo	21
Chicago & Joliet Elec. Ry.	6	4	Mack	Mack	21 to 25
		2	Graham	Graham	21 to 25
Chicago, No. Shore & Milwaukee R.R.	6	2	Fageol	Fageol	22
		3	Studebaker	Studebaker	18
		1	Pierce Arrow	Bender	16
Chicago & West Towns Ry.	10	10	Reo	Cunningham	21
East St. Louis Ry.	6	3	Mack	St. Louis Car	29
		1	Mack	Mack	29
		1	Yellow Coach	St. Louis Car	29
		1	Yellow Coach	Yellow Coach	29
Illinois Power Co.	3	3	.....	.....	29
Illinois Pwr. & Lt. Corp. (Bloomington)	6	6	Mack	Mack	25
Illinois Pwr. & Lt. Corp (Champaign)	9	3	Yellow Coach	Yellow Coach	29
		6	White	White	25
Illinois Pwr. & Lt. Corp. (Danville)	4	4	Yellow Coach	Yellow Coach	29
Illinois Pwr. & Lt. Corp. (Galesburg)	7	5	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
Illinois Pwr. & Lt. Corp. (Peoria)	9	8	Yellow Coach	Yellow Coach	29
		1	International	.....	29
Illinois Pwr. & Lt. Corp. (Quincy)	8	8	White	.....	25
Illinois Traction System (Main Line)	2	2	Yellow Coach	Yellow Coach	21
Illinois Traction System (Valley Div.)	1	1	International	.....	25
Joliet Plainfield & Aurora Transp. Co.	1	1	Pierce Arrow	.....	30
Rockford City Traction Co.	3	3	Yellow Coach	Yellow Coach	29
Indiana					
Chicago South Bend & Northern Indiana Ry.	6	6	Reo	Fitzjohn	21
Gary Rys.	45	13	Yellow Coach	Yellow Coach	29
		9	Yellow Coach	Yellow Coach	21
		13	Int. Harvester	Lang	24
		2	Int. Harvester	Lang	21
		8	Int. Harvester	Int. Harvester	12
Indianapolis & Cincinnati Traction Co.	4	4	Fageol	Fageol	31
Indianapolis St. Ry.	24	24	Yellow Coach	Yellow Coach	29
Indiana Service Corp.	5	5	Int. Harvester	Int. Harvester	20
Interstate Pub. Serv. Co.	8	2	Studebaker	.....	19
		4	Fageol	.....	22
		2	Reo	.....	20
Northern Indiana Power Co.	2	2	Int. Harvester	Int. Harvester	12
Southern Indiana Gas & Elec. Co.	6	6	Dodge	Graham	21
Terre Haute, Indianapolis & Eastern	10	5	Yellow Coach	Yellow Coach	29
		5	Reo	Reo	21
Union Traction Co.	10	5	Reo	Fitzjohn	21
		5	White	Kuhlman	25
Iowa					
Dubuque Electric Co.	4	4	Mack	Mack	25
Iowa Southern Utilities Co. (Burlington)	4	4	Mack	Mack	25
Iowa Southern Utilities Co. (Centerville)	3	3	Graham	Graham	21
Waterloo, Cedar Falls & Northern Ry.	2	2	Mack	Mack	29
Kentucky					
Kentucky Traction & Terminal Co.	5	5	White	Kuhlman	25
Louisville Ry.	5	4	Yellow Coach	.....	29
		1	White	Bender	25
Michigan					
City of Detroit, Dept. of St. Rys.	135	123	Dodge	Graham	21
		12	Reo	Reo	29
Detroit United Ry.	40	40	Yellow Coach	Yellow Coach	29
Grand Rapids Ry.	2	2	Yellow Coach	Yellow Coach	21
Michigan R.R.	14	14	Fageol	Fageol	26
Michigan Elec. Ry.	12	12	Fageol	Fageol	26
Minnesota					
Duluth St. Ry.	4	2	White	Eckland	...
		2	Mack	Eckland	...
Mesaba Ry.	9	3	Mack	Eckland	20
		3	White	Eckland	20
		3	Fageol	.....	29
Twin City Rapid Transit Co.	8	7	Mack	Eckland	...
		1	Mack	Lang	...
Missouri					
Kansas City, Clay County and St. Joseph Ry.	5	1	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	18
		1	Studebaker	.....	18
Kansas City Rys.	67	2	Mack	Mack	29
		11	Mack	American	29
		19	Yellow Coach	American	29
		6	Yellow Coach	American	29
		5	Six Wheel	St. Louis Car Co.	31
		18*	Six Wheel	St. Louis Car Co.	63
		6	Dodge Graham	Dodge Graham	21

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Buses Ordered by Railways During 1925—(Continued)

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
Missouri—continued					
Missouri Power & Light Co	3	3	Mack	Mack	25
Springfield Traction Co	5	3	Yellow Coach		
		2	Dodge	Graham	
St. Louis Elec. Terminal Ry	6	6	Yellow Coach	Yellow Coach	29
United Rys. of St. Louis	36	5	Six Wheel	St. Louis Car	29
		24	White	St. Louis Car	29
		2	White	U. R. C.	25
		4	White	Anheuser-Busch	29
		1	Mack	St. Louis Car	29
Ohio					
Cleveland Ry	101	30	White	Kuhlman	29
		30*	Six Wheel	Six Wheel	62
		1	Six Wheel	Six Wheel	29
		10*	Six Wheel	Six Wheel	62
		30	White	Kuhlman	29
Columbus, Urbana & Western Ry	2	2	Reo		21
Indiana, Columbus & Eastern Trac. Co.	1	1	Fageol	Fageol	22
Penn-Ohio Elec. Co	5	5	White	Bender	25
Southern Ohio Public Service Co	26	5	Ace	Ace	25
		2	Fageol	Fageol	28
		3	Studebaker	Studebaker	18
		4	Fageol	Fageol	22
		12	Studebaker	Studebaker	11
Youngstown & Suburban Ry	3	3	Fageol	Fageol	22
Youngstown Municipal Ry	2	2	White	Bender	25
Stark Elec. R.R.	6	6	Yellow Coach	Yellow Coach	21
Wisconsin					
Madison Railways	6	6	Yellow Coach	Yellow Coach	29
Milwaukee Elec. Ry. & Light Co	19	5	Fageol	Fageol	31
		3	Yellow Coach	Yellow Coach	31
		2	Fageol	Fageol	23
		9	Yellow Coach	Yellow Coach	29
Wisconsin Power & Light Co	21	4	Fageol	Fageol	25
		3	Hudson	Hudson	7
		2	Yellow Coach	Yellow Coach	27
		5	Yellow Coach	Yellow Coach	30
Wisconsin Public Service Co	3	2	Reo		21
		1	Yellow Coach		23
Wisconsin Valley Elec. Co	8	2	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
		2	Reo	McKinnon	13
		2	G. M. C.	McKinnon	18
Arkansas					
Arkansas Central Power Co	3	1	Yellow Coach	Yellow Coach	21
		1	Mack	Mack	21
		1	White	White	25
Hot Springs St. Ry	2	2	Reo		
Florida					
Key West Elec. Co	4	4	Mack	Amer. Car Co.	29
Tampa Elec. Co	22	16	Mack	Birney	29
		6	Reo	Reo	21
Georgia					
Columbus Elec. & Power Co	13	8	Mack	Amer. Car Co.	29
		5	White	Amer. Car Co.	29
Georgia Ry. & Power Co	15	15*	Fageol	Fageol	60
Savannah Elec. & Power Co	2	1	Dodge	Graham	21
		1	Mack	Mack	29
Louisiana					
Baton Rouge Elec. Co	3	3	Mack	Birney	29
New Orleans Pub. Serv. Inc	14	1	Graham	Graham	21
		4	Yellow Coach	Yellow Coach	29
		6	Mack	Mack	29
		3	Fageol	Amer. Car Co.	29
Mississippi					
Mississippi Power & Light Co	1	1	Yellow Coach	Yellow Coach	21
Mississippi Power Co	10	8	Fageol	Fageol	21
		2	Reo	St. John	19
North Carolina					
Asheville Power & Light Co	2	2	White		16
Carolina Power & Light Co	1	1	White	Bender	21
Durham Public Service Co	11	8	Reo	Fitzjohn	21
		3	Mack	Kuhlman	25
Southern Public Utilities Co	1	1	White	White	21
Tennessee					
Tennessee Elec. Power Co	5	5	Fageol	Fageol	29
Arizona					
Tuscon Rapid Transit Co	5	2	Dodge	Graham	21
		2	Garford	Garford	21
		1	Reo	Locally Built	18
California					
Key System Transit Co	13	4	Dodge	Graham	16
		1	Dodge	Graham	21
		1	Pierce Arrow.		29
		4	Pierce Arrow		25
		1	Pierce Arrow		29
		2	Yellow Coach	Yellow Coach	29
Los Angeles Ry	40	20			
		20*			
Market St. Ry	1	1	Fageol	Fageol	29
Municipal Ry. of San Francisco	4	1	White	White	25
		3	Pierce Arrow	Cal. Motor Coach	29
Pacific Elec. Ry	5	3*	Fageol		58
		2*	Moreland	Moreland	59
Pacific Gas & Elec. Co	3	3	Moreland	Moreland	16
Peninsular Ry	4	4	Fageol	Fageol	29
San Diego Elec. Ry	2	2	Dodge	Graham	
Colorado					
Denver & Interurban R.R.	4	4	Yellow Coach	Yellow Coach	30
Denver Tramway	3	1	Fageol	Fageol	21
		1	Graham	Graham	21
		1	Studebaker	Auto Body Co	21
Idaho					
Boise St. Car Co	2	2	Pierce Arrow	Brown	29
Kansas					
Arkansas Valley Interurban Ry	3	3	White		14
Kansas City, Leavenworth & Western Ry	6	5	Mack	Mack	25
		1	Graham	Graham	20
Topeka Ry	11	11	Mack	Mack	25

neer companies to engage in bus operation, the United Railways & Electric Company of Baltimore, in April purchased the East Fayette Street bus line in that city and added 37 more buses to the 44 which were in service at the beginning of the year.

Increase in the number of comparatively small electric railways operating buses has been relatively greater than in the number of large companies. This is because many of the larger railways were listed as operators last year. Among the newcomers of the former class are Gardner-Templeton Street Railway; Laconia Street Railway; Cumberland & Westernport Electric Railway; Black River Traction Company; Chambersburg & Shippensburg Railway; Lehigh Traction Company; Rio Grande Valley Traction Company; Wichita Falls Traction Company; Lewiston & Clarkston Transit Company; and in Canada, the Grand River Railway and the Windsor, Essex & Lake Shore Rapid Railways.

In general, the development during the past year has been greater among the urban street railways than among the interurbans. Among the new city companies now operating buses are those in Cleveland, Denver, Duluth, Erie, Indianapolis, Omaha, Pittsburgh, Portland, Wilkes-Barre and Worcester.

New bus operations by interurban electric railways have not been lacking, however. Following is a list of some of the companies which have undertaken such service: New Haven & Shore Line Railway; Boston & Worcester Street Railway; Washington & Old Dominion Railway; Auburn & Syracuse Electric Railroad; Rochester & Syracuse Railroad; Syracuse & Eastern Railroad; Lackawanna & Wyoming Valley Railroad; Charleston Interurban Railroad; Aurora, Elgin & Fox River Electric Company; Indianapolis & Cincinnati Traction Company; Terre Haute, Indianapolis & Eastern Traction Company; Denver & Interurban Railroad; Kansas City, Leavenworth & Western Railway.

Considering geographically the development of bus operation by electric railways during the past year, the largest proportionate increase is found to have been in the Southern states. Bus service has been undertaken in Atlanta, Ga.; Baton Rouge, La.; Chattanooga, Tenn.; Durham, N. C.; Hot Springs, Ark.; Key West, Fla.; Lynchburg, Va.; Roanoke, Va.; Savannah, Ga.; Tampa, Fla. Substantial increases in number of electric railways operating buses occurred also in other sections of the country, but development there was rela-

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Buses Ordered by Railways During 1925—(Concluded)

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
Nebraska					
Omaha & Council Bluffs St. Ry.	5	5	White	Weir	25
Oklahoma					
Northeast Oklahoma R.R.	3	3	Dodge	Graham	21
Oklahoma Ry.	7	4	Dodge-Graham	Graham	21
		3	Reo	Reo	21
Oklahoma Union Ry.	27	17	Mack	Mack	25
		1	Reo	Reo	15
		1	Reo	Reo	16
		2	Reo	Reo	20
		3	Reo	Reo	21
		3	Dodge	Graham	21
Oregon					
Portland Elec. Power Co.	22	3	Fageol		29
		3	Yellow Coach		29
		3	Fageol		29
		2	Yellow Coach		29
		6	Yellow Coach		21
		2	Fageol	Gas-Elec	29
		3	Yellow Coach	Gas-Elec.	29
South Dakota					
Sioux Falls Traction System	6	1	Dodge		17
		4	White	Eckland	25
		1	Hudson		7
Texas					
Abilene Traction Co.	1	1	Reo	Fitzjohn	21
North Texas Traction Co.	4	2	Reo	Reo	21
		2	Yellow Coach	Yellow Coach	21
Rio Grande Valley Traction Co.	5	5	Reo	Reo	21
San Antonio Public Service Co.	14	....	....	....	....
Hudson Elec. Co.	2	1	Yellow Coach	Yellow Coach	29
		1	Yellow Coach	Yellow Coach	21
Texas Electric Ry.	6	3	Dodge	Graham	21
		1	Reo	Reo	16
		2	Studebaker	Studebaker	13
Wichita Falls Traction Co.	2	2	Reo		21
Utah					
Utah-Idaho Central R.R.	2	2	Fageol	Fageol	19
Washington					
Grays Harbor Ry. & Lt. Co.	3	3	White	Local	29
Lewiston-Clarkston Transit Co.	1	1	Studebaker	Auto Body Co.	...
Puget Sound Elec. Ry.	4	1	Yellow Coach	Yellow Coach	25
		3	Yellow Coach	Yellow Coach	17
Puget Sound Int. Ry. & Powr. Co.	4	3	Fageol	Newell	26
		1	Studebaker	Auto Body Co.	21
Seattle Municipal Street Ry.	10	5	Garford	Local	29
		5	Studebaker		21
Canada					
British Columbia Elec. Ry.	9	6	Leyland	Local	29
		1	White	Local	29
		2	White	Local	29
Grand River Ry.	3	3	Fageol	Fageol	29
Hydro Elec. Rys.	4	4	Gotfredson	Commercial	21
Montreal Tramways	24	8	Yellow Coach		29
		10	White	Brown	25
		4	Six-Wheel		29
		2	Reo	Reo	21
Ottawa Elec. Ry.	2	2	Reo	Ottawa Car Mfg. Co.	21
Toronto Transportaton Comm.	36	3	White	T. T. C.	29
		15	Yellow Coach	T. T. C.	29
		6	Yellow Coach	T. T. C.	29
		3	Republic		30
		2	Ruggles		30
		6	Courier		30
		1	Courier		25
Windsor, Essex Lake Shore Rapid Rys.	2	2	Gotfredson	Gotfredson	18
Winnipeg Elec. Co.	10	7	Reo	Railway Shop	21
		3	Dodge-Graham	Railway Shop	16
Porto Rico					
Ponce Elec. Co.	3	3	Reo	Fitzjohn	21
Total	2,171				

*Denotes Double-Deck

tively less pronounced. The number of companies in each geographical division as reported in the statistical issues of ELECTRIC RAILWAY JOURNAL for 1924 and 1925 are given in the accompanying table, as well as the figures for Jan. 1, 1926.

New buses ordered during 1925 numbered 2171 as compared with 963 ordered in 1924. Buses acquired with the purchase of independent companies and retained in service by electric railways account for the difference between the total increase of nearly 2,900 and the amount of the orders. On the other hand, the net increase is affected by the considerable number of buses which were scrapped during the year.

Among the large purchases during 1925 were 123 Graham Brothers 21-passenger buses for the Department of Street Railways, city of Detroit. The Cleveland Railway, Kansas City Railways, Los Angeles Railway, Gary Railways, and the Boston Elevated were companies which placed large orders during the year.

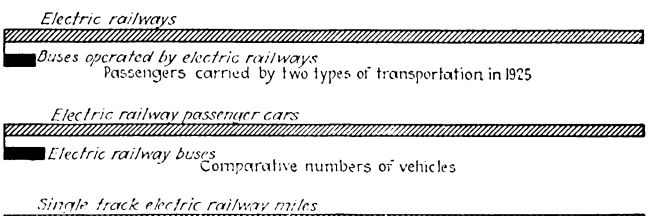
In the latter part of December the Public Service Railway placed an order for 333 gas-electric buses with the Yellow Coach Manufacturing Company. Electrical equipment is to be supplied by the General Electric Company. While the exact purchase price was not announced it is said to be approximately $3,000,000. This is the largest single order for buses that has ever been placed by any electric railway in the United States or Canada.

Other automotive equipment ordered by electric railways also shows a large increase over previous years. Reports received show 284 motor trucks purchased in 1925 as compared with 105 in 1924, 148 in 1923, and 112 in 1922. The 1-ton type was the most popular size, with the 3½-ton type second. Others ranged in size from ½ ton to 7 tons. None of the companies reported the purchase of any trackless trolleys.

Purchases of new equipment for the year show a slightly different trend from those of previous years. A number of companies have acquired double-deck vehicles, among them being the railways in Atlanta, Baltimore, Cleveland, Kansas City and Los Angeles. The actual number of double-deck buses shown in the table of purchases for the year, approximately 100, is less than for the preceding year, when 191 were ordered. This is explained by the fact that the order of the Philadelphia Rapid Transit Company for 125 such vehicles was included in the sta-

Geographical Classification of Electric Railways Operating Buses

	Jan. 1, 1924	Jan. 1, 1925	Jan. 1, 1926
New England States	14	19	29
Eastern States	31	43	74
Central States	39	48	83
Southern States	5	9	25
Western States	26	28	55
Canada	5	9	11
Panama	1	..	1
Porto Rico	..	..	1
Hawaiian Islands	..	..	1
Total	121	156	280



Comparison of Transportation Services Furnished by Electric Railway Companies in the United States and Canada as of Jan. 1, 1926

Passengers carried by rail are estimated to be 16,000,000,000 and by electric railway buses approximately 800,000,000. Electric railway passenger cars number about 82,000 while some 5,300 buses are operated by these companies. Single-track electric railway mileage is 46,000 and bus routes total some 13,000 miles.

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Bus Route Extensions During 1925

Name of Railway	Name of Operating Co.	City Miles	Intercity Miles	Touring Miles	Sightseeing Miles	Replaced Miles
Connecticut						
Connecticut Co.		10.04	79.28	.....	.....	38.72
Hartford & Springfield St. Ry.		.....	9.70	.....	.....	9.70
Waterbury & Milldale Tramway		.....	0.75	.....	.....	.....
Maine						
Central Maine Power Co.		.....	12.00	.....	.....	4.50
York Utilities Co.		8.50	34.50	.....	.....	4.50
Massachusetts						
Boston Elevated Ry.		25.50	.....	.....	.....	32.00
Boston & Worcester St. Ry.		6.00	.....	.....	.....	6.00
Eastern Massachusetts St. Ry.		13.10	38.40	.....	.....	8.80
Gardner-Templeton St. Ry.		.....	5.00	.....	.....	.....
Middlesex & Boston St. Ry.		2.00	.....	.....	.....	.....
Springfield St. Ry.		5.70	.....	.....	.....	1.32
Union St. Ry. of New Bedford		.....	34.00	.....	.....	.....
Worcester Consolidated St. Ry.		3.00	68.00	.....	.....	10.10
New Hampshire						
Portsmouth Electric Ry.	Boston & Maine Transp. Co.	18.00	.....	.....	.....	18.00
Rhode Island						
Newport Electric Corp.		6.90	40.00	.....	.....	20.00
United Electric Rys.		.....	18.88	.....	.....	10.10
Vermont						
Bellows Falls & Saxton River St. R.R.	Pierce Bus Co.	2.00	4.00	.....	.....	.....
District of Columbia						
Capital Traction Co.		11.03	.....	.....	.....	.....
Washington & Old Dominion Ry.		.....	16.80	.....	.....	.....
Washington Ry. & Electric Co.		18.65	.....	.....	.....	2.63
Washington Ry. & Electric Co.	City & Surburban Ry. of Washington	2.65	14.90	.....	.....	5.62
Washington-Virginia Ry.		.....	23.00	.....	.....	.....
Maryland						
Cumberland & Westernport Electric Ry.		.....	22.10	.....	.....	16.60
United Rys. & Electric Co.	Baltimore Transit Co.	4.57	.....	54.00	.....	.....
United Rys. & Electric Co.	East Fayette St. Bus Co.	23.45	.....	.....	5.50	.....
New Jersey						
Morris County Traction Co.		.....	3.00	.....	.....	.....
Trenton & Mercer County Traction Corp.	Central Transportation Co.	42.70	.....	.....	.....	.....
New York						
Auburn & Syracuse Electric R.R.	Mid-State Coach Lines, Inc.	4.80	.....	.....	.....	1.90
Black River Traction Co.	Watertown Transportation Co.	1.24	.....	.....	.....	.....
Empire State R.R.	Mid-State Coach Lines, Inc.	7.00	.....	.....	.....	.....
International Ry.	International Bus Corp.	20.70	8.09	.....	.....	4.42
New York State Rys.		7.50	221.00	.....	.....	.....
Olean, Bradford & Salamanca Ry.	O. B. & S. Bus Line	.....	9.00	.....	20.00*	9.00
Rochester & Syracuse R.R.	Mid-State Coach Lines, Inc.	.....	13.50	.....	.....	.....
United Traction Co., Albany	Capitol District Transp. Co.	9.52	.....	.....	.....	1.24
Pennsylvania						
Buffalo & Erie Ry.	Buffalo & Erie Coach Corp.	0.50	3.00	.....	.....	.....
Chambersburg & Shippensburg Ry.	Cumberland Valley Transit Co.	2.00	9.00	.....	.....	9.00
Citizens Traction Co.	Citizens Transit Co.	4.00	22.00	.....	.....	9.00†
Erie Rys.	Erie Coach Co.	3.00	.....	.....	.....	.....
Lehigh Traction Co.	Hazelton Auto Bus Co.	1.40	4.50	.....	.....	.....
Lehigh Valley Transit Co.	Lehigh Valley Transportation Co.	8.09	.....	.....	.....	.....
Monongahela-West Penn Public Service Co.		.....	32.80	.....	.....	.....
Schuylkill Ry.	Schuylkill Transportation Co.	.....	10.00	.....	.....	.....
Scranton Ry.		0.50	2.00	.....	.....	.....
Shamokin & Edgewood Electric Ry.	Shamokin & Trevorton Bus Line	1.00	8.00	.....	.....	.....
Stroudsburg Traction Co.	E. Stroudsburg Bus Co.	8.50	.....	.....	.....	.....
Westmoreland County Ry.		.....	5.00	.....	.....	.....
Virginia						
Roanoke Ry. & Electric Co.	Roanoke Rapid Transit Co.	2.60	8.50	.....	.....	.....
Virginia Electric & Power Co.	Richmond Rapid Transit Co.	9.00	.....	.....	.....	.....
Virginia Electric & Power Co.		17.00	.....	.....	.....	.....
West Virginia						
Charleston Interurban R.R.		2.50	.....	.....	.....	.....
Monongahela West Penn Public Service Co.		.....	32.80	.....	.....	.....
Illinois						
Aurora, Elgin & Fox River Electric Co.		.....	12.48	.....	.....	8.91
Central Illinois Public Service Co.		9.00	.....	.....	.....	7.41
Chicago & Joliet Electric Ry.		6.00	.....	.....	.....	.....
Chicago North Shore & Milwaukee R.R.		.....	123.50	.....	*	.....
Chicago & West Towns Ry.		4.50	.....	.....	.....	.....
East St. Louis Ry.		3.40	3.60	.....	.....	2.00
Illinois Power Co.		2.08	.....	.....	.....	
Illinois Power & Light Corp.		0.75	.....	.....	.....	0.75
Rockford City Traction Co.		3.30	.....	.....	.....	.....
Rockford & Interurban Ry.		.....	33.50	.....	.....	.....
Indiana						
Indianapolis & Cincinnati Traction Co.		.....	28.00	.....	.....	.....
Indianapolis Street Ry.		56.88	.....	.....	.....	.....
Interstate Public Service Co.		.....	103.00	.....	.....	.....
Terre Haute, Indianapolis & Eastern Trac. Co.		10.40	.....	.....	.....	.....
Gary Rys.		34.00	260.00	.....	.....	.....
Union Traction Co.		.....	127.60	.....	.....	.....
Iowa						
Dubuque Electric Co		5.30	.....	.....	.....	.....
Iowa Southern Utilities Co., Burlington		7.00	.....	.....	.....	2.50
Kentucky						
Kentucky Traction & Terminal Co.	Kentucky Coach Co.	10.00	.....	.....	.....	.....
Louisville Ry.	Kentucky Carriers	4.90	.....	.....	.....	.....
Michigan						
Department of St. Rys., Detroit		79.97	.....	.....	.....	.....
Grand Rapids Ry.		1.42	.....	.....	.....	.....
Michigan Electric Ry.	Southern Michigan Transportation Co.	.....	105.50	.....	.....	.....
Detroit United Rys.		25.40	10.40	.....	.....	14.60

* Summer operation only. † Titusville Traction Co.

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Bus Route Extensions During 1925—(Concluded)

Name of Railway	Name of Operating Co.	City Miles	Intercity Miles	Touring Miles	Sightseeing Miles	Replaced Miles
Minnesota						
Duluth St. Ry.	Duluth Coach Co	2.00	8.15	.....	.....	.....
Twin City Rapid Transit Co	Twin City Motor Bus Co	.....	52.30	.....	.....	.....
Missouri						
Kansas City Clay County & St. Joseph Ry		.....	60.00	.....	.....	.....
Kansas City Rys		43.98	.....	.....	.....	.....
Missouri Power & Light Co		3.00	.....	.....	.....	.....
St. Louis Terminal Ry		8.75	.....	.....	.....	.....
United Rys. of St. Louis	St. Louis Bus Co	17.45	.....	.....	1.50	.....
United Rys. of St. Louis	Missouri Electric R.R	.....	12.90	.....	.....	.....
Ohio						
Cleveland Railway		40.14	.....	.....	.....	1.76
Community Traction Co		0.51	.....	.....	.....	0.51
Indiana, Columbus & Eastern Traction Co	Dayton & Columbus Transportation Co	.....	24.00	.....	.....	.....
Stark Electric R.R		10.00	.....	.....	.....	3.00
Wisconsin						
Madison Rys		10.00	.....	.....	.....	.....
Milwaukee Electric Ry. & Light Co		5.82	103.00	.....	.....	1.28
Wisconsin Power & Light Co		2.00	283.50	25.00	.....	2.00
Wisconsin Valley Electric Co		1.70	.....	.....	.....	.....
Florida						
Key West Electric Co		2.30	.....	.....	.....	1.90
Tampa Electric Co		6.00	.....	.....	.....	.....
Georgia						
Columbus Electric & Power Co	Columbus Transp. Co	12.41	.....	.....	.....	5.92
Georgia Ry. & Power Co	Atlanta Coach Co	19.20	.....	.....	.....	.....
Georgia Ry. & Power Co	Georgia Ry. & Light Co	3.81	.....	.....	.....	.....
Savannah Electric & Power Co		1.25	.....	.....	.....	0.41
Louisiana						
Baton Rouge Electric Co		2.60	.....	.....	.....	.....
New Orleans Public Service, Inc		5.91	.....	.....	.....	1.12
North Carolina						
Asheville Power & Light Co		2.00	.....	.....	.....	.....
Carolina Power & Light Co		1.50	.....	.....	.....	.....
Durham Public Service Co		8.50	.....	.....	.....	4.10
Tennessee						
Tennessee Electric Power Co		5.50	.....	.....	.....	.....
Arizona						
Tuscon Rapid Transit Co		5.15	.....	.....	.....	.....
California						
Los Angeles Ry		18.70	.....	.....	.....	.....
Municipal Ry. of San Francisco		1.30	.....	.....	.....	.....
Peninsular Ry		3.87	.....	.....	.....	3.87
San Diego Electric Ry		4.50	.....	.....	.....	.....
Pacific Gas & Electric Co		3.93	.....	.....	.....	.....
Market St. Ry		0.82	.....	.....	.....	1.38
Kansas						
Arkansas Valley Interurban Ry		8.00	68.50	.....	.....	.....
Kansas, Leavenworth & Western Ry	Leavenworth Transportation Co	5.36	.....	.....	.....	5.36
Topeka Ry		8.80	.....	.....	.....	.....
Nebraska						
Omaha & Council Bluffs St. Ry		8.50	.....	.....	.....	.....
Oklahoma						
Northeast Oklahoma R.R		.....	11.00	.....	.....	.....
Oklahoma Ry		7.00	.....	.....	.....	.....
Texas						
Abilene Traction Co		4.00	.....	.....	.....	.....
Wichita Falls Traction Co		3.00	.....	.....	.....	.....
Washington						
Grays Harbor Ry. & Light Co	Twin City Transit Co	1.80	.....	.....	.....	.....
Lewiston & Clarkston Transit Co		8.00	.....	.....	.....	.....
Pacific Northwest Traction Co		.....	102.00	.....	.....	.....
Portland Electric Power Co		6.64	.....	.....	.....	.....
Seattle Municipal Street Ry		10.60	.....	.....	.....	1.10
Canada						
British Columbia Electric Ry		2.20	12.00	.....	.....	.....
Grand River Ry		2.50	2.00	.....	.....	4.50
Montreal Tramways		10.85	8.80	.....	.....	.....
Toronto Transportation Commission		6.24	.....	.....	34.00	.....
Windsor, Essex & Lake Shore Rapid Ry	Highway Motor Coach Lines	6.38	30.23	.....	.....	.....
Porto Rico						
Ponce Electric Co		3.00	.....	.....	.....	.....
Totals		936.41	2,399.46	79.00	61.00	297.53

tistics for 1924, although the vehicles did not actually go into service until the present year.

Gas-electric buses have appeared for the first time this year in a number of localities. Besides those of the Philadelphia Rapid Transit Company and the recent order by the Public Service Railway, gas-electrics have been purchased by the Georgia Railway & Power Company, the Kansas City Railways and the United Traction Company of Albany, N. Y. A feature of certain of the buses bought by the Kansas City Railways is an automatic rear exit. This is the first time that such a device has been tried and thus far the Kansas City company is the only operator to include this feature.

The parlor car type of bus appears to be growing in popularity as compared with the so-called street car type, although the number of the latter type purchased during the past year remains somewhat larger than the number of the de luxe type. An interesting example of the way these may be used by an electric railway is the operation of the Chevy Chase bus line of the Capital Traction Company, Washington, D. C. Under this plan commodious buses are operated from the Chevy Chase residential district downtown to the shopping section of the city. An extra fare is charged on account of the superior quality of the transportation service which is provided.

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Electric Railway Costs and Fares Continue Stable in 1925

Only a Few Points Variation Has Occurred in Major Index Figures During the Year—Discussion of Trends Indicates Stability for Coming Year—Several Changes in Method of Computing Figures

By Albert S. Richey
Electric Railway Engineer, Worcester, Mass.

ON THE following page there is a chart showing graphically the course during the past twelve years of five index numbers which may be of interest to electric railway owners and operators. The indexes included are of (1) wholesale commodities, (2) electric railway construction costs, (3) electric railway operating material costs, (4) electric railway wages, and (5) street railway fares. Accompanying the graphic presentation is a tabulation showing the average indexes for each year, 1913 through 1920 inclusive, and the monthly indexes from January, 1920, to and including the latest available data. Each index is shown on the base of 1913 = 100. The five indexes here shown are among the twelve which make up the Conspectus of Indexes which is compiled monthly by the writer and published regularly in the Financial and Corporate section of the ELECTRIC RAILWAY JOURNAL—usually in the fourth issue of each month. Similar charts and tables have been published in the Annual Statistical Numbers—the first issue of the JOURNAL in January in 1923, 1924 and 1925. At this time the new Electric Railway Construction Cost Index of the American Electric Railway Association is included, replacing the general Construction Cost Index of the *Engineering News-Record* which has appeared in the charts previously published.

COMPUTATION OF THE INDEXES

The various indexes and the methods used in their computation will be given here, inasmuch as it has been two years since this résumé has included such a statement, and as additional data are now included. The Wholesale Commodity Index of the United States Bureau of Labor Statistics represents the course of the weighted average price of more than 400 commodities, as computed monthly by the bureau. This index is perhaps the most authoritative, the most widely used, and most often quoted of any which purposes to show the trend of the general price level. The various commodities on which prices are collected and used in the computation of this index include groups such as farm products, foods, cloths and clothing, fuel and lighting, metals and metal products, building materials, chemicals and drugs, house furnishing goods, and miscellaneous items. Separate indexes are published by the bureau covering these constituent groups as well as the all-commodity index which represents the combination of all groups and which is the one here quoted. The latest bulletin of the Bureau on Wholesale Prices is No. 390, issued in July, 1925, and covering the period 1890 to 1924. This bulletin contains a description of the weightings and the methods used in computing these indexes, together with data as to actual and relative prices of the various commodities and relative prices of the groups of commodities which enter into the index. The index numbers as shown in that bulletin cover the entire period beginning with 1890, in which year the all-commodities index stood at 80.5. Its low point was 66.7 for the year 1896, after which year it gradually increased, reaching a value of 100.9 in 1910. Its course since 1913 is shown by the data included herewith.

The Electric Railway Construction Cost Index of the American Electric Railway Association was proposed by the valuation committee of that association at the Atlantic City convention last October. The report of that committee, quoted on page 584 of the Oct. 10, 1925, issue of the JOURNAL, contains a description of the data and method used in their compilation. It is still in a tentative form and subject to change as data are received from members of the association comparing actual valuation figures with the index as proposed. It may be assumed, however, that it is a fairly good index of the construction cost of the average electric railway, excluding land values, and it may be used to determine at least approximately what figure might be arrived at by a valuation of an electric railway property on the basis of present prices, if a valuation of the same property has been made at some previous time, using prices then current. The index here shown for the year 1916 is not as printed in the report of the valuation committee last October, as it has been corrected here to correspond with changes which are just now being made by the *Engineering News-Record* in its indexes of common labor and general construction costs, these being constituent elements of the Electric Railway Construction Cost Index. The change thus made necessary in this index for the year 1916 brings it more closely in line with available data on electric railway valuations.

The Electric Railway Operating Materials Cost Index is not one of construction costs but applies to the materials used in electric railway maintenance and operation. The weighting of the cost of such materials differs, of course, from that used in a construction cost index, and there is a further material difference in that this index does not include any labor costs which make up so large a part of the first cost of railway construction. The index, however, does include fuel cost, at a weighting of 40 per cent of the total. While many railways purchase power, most power contracts include a so-called coal clause which varies the price of power with the cost of coal, and it is for this reason that the cost of fuel for power is included in the index,

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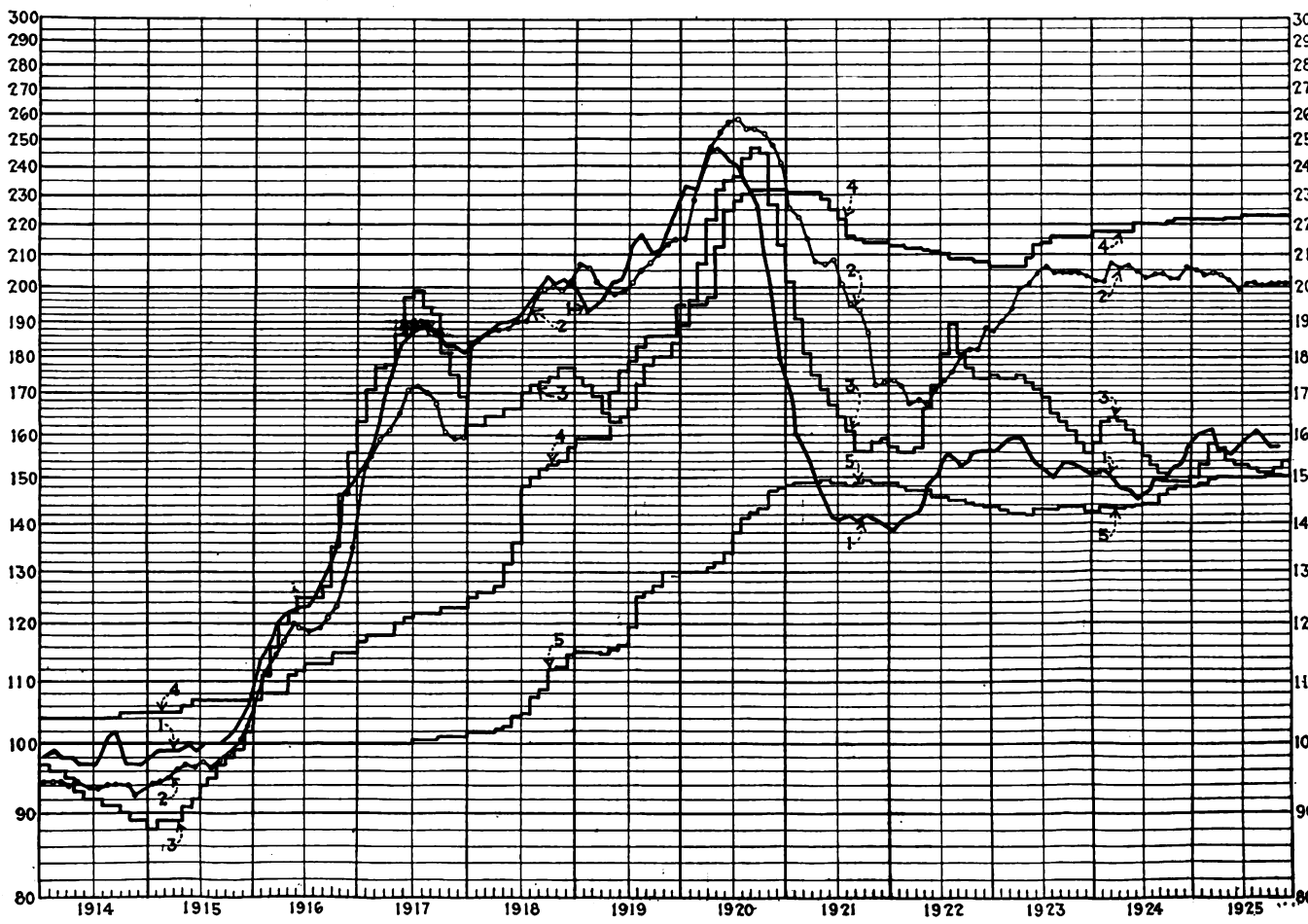
Trend of Construction Costs, Wages and Fares, 1913-1926, as Collected by Albert S. Richey



1. Wholesale prices all commodities (U. S. Bureau of Labor Statistics).

2. Electric railway construction costs (American Electric Railway Association statistics).

3. Electric railway operating materials costs (Richey). Includes fuel for power and weighted according to average use in maintenance and operation.

4. Electric railway wages (Richey). Maximum hourly wages of platform men, weighted according to number of men.

5. Street railway fares (Richey). U. S. cities (except New York) weighted according to population.

	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)
1913 average	100.0	100.0	100.0	100.0	100.0
1914 average	98.1	94.0	92.6	104.2	100.0
1915 average	100.8	97.3	93.5	106.2	100.1
1916 average	126.8	119.8	126.2	111.6	100.1
1917 average	177.2	162.7	181.9	120.6	100.5
1918 average	194.3	192.5	168.8	140.5	106.2
1919 average	206.4	205.1	172.2	174.0	120.7
1920 average	226.2	244.7	224.6	217.3	137.2
1920					
January	233.2	214.4	189.3	195.0	129.9
February	232.4	227.7	196.2	195.0	129.9
March	234.4	234.1	207.3	195.0	130.2
April	244.6	246.1	221.1	197.0	131.1
May	246.7	252.9	231.7	213.0	131.9
June	243.3	256.1	235.6	226.0	134.0
July	240.7	256.4	237.3	228.0	138.0
August	231.4	254.0	242.7	231.0	141.5
September	226.2	254.2	247.5	232.0	142.6
October	211.3	252.0	245.2	232.0	143.3
November	196.4	247.6	227.4	232.0	147.0
December	179.2	240.6	213.4	232.0	147.5
1921					
January	169.8	224.9	201.6	231.5	148.2
February	160.1	223.4	190.8	231.4	148.6
March	155.4	215.9	180.8	231.4	148.9
April	147.9	208.0	174.7	231.3	149.1
May	145.5	207.3	171.0	228.2	149.6
June	141.6	208.0	166.6	224.6	148.9
July	141.0	200.8	163.6	221.3	149.0
August	141.5	195.3	160.4	215.5	148.7
September	141.5	193.6	156.1	215.1	148.9
October	141.6	186.6	156.3	214.3	149.6
November	140.7	172.4	158.0	214.2	148.9
December	139.8	172.6	159.1	214.0	148.6
1922					
January	138.3	172.6	157.0	212.6	148.6
February	141.4	171.9	156.4	212.6	147.8
March	142.2	167.7	155.8	211.9	147.4
April	142.6	168.6	157.0	211.9	147.4
May	147.6	167.4	166.0	211.5	147.4
June	149.6	171.0	172.0	210.8	145.5
July	154.9	173.8	180.8	210.2	145.5
August	155.0	176.0	188.9	208.3	144.9
September	153.3	180.5	181.0	207.8	144.8
October	154.1	182.4	176.9	207.8	144.6
November	155.5	182.6	174.4	207.5	144.1
December	156.2	187.4	174.1	207.7	143.7
1923					
January	155.8	187.3	175.2	207.1	143.4
February	156.7	190.6	173.9	207.1	143.4
March	158.6	194.8	174.2	206.8	142.4
April	158.7	199.0	175.3	207.0	142.3
May	156.2	201.0	173.1	209.0	142.1
June	153.5	204.1	171.3	212.6	142.9
July	150.6	205.3	169.1	213.5	142.9
August	150.1	204.3	165.5	216.2	142.9
September	153.7	204.0	163.2	216.4	143.4
October	153.1	204.3	160.9	216.4	143.5
November	152.1	204.4	158.3	216.4	143.5
December	151.0	203.3	155.5	216.4	142.4
1924					
January	151.2	203.0	158.5	217.4	142.6
February	151.7	203.8	163.2	217.4	143.1
March	149.9	206.8	163.9	217.5	143.1
April	148.4	205.5	162.8	217.7	143.2
May	146.9	206.7	160.8	217.8	143.5
June	144.6	204.8	157.6	220.0	143.8
July	147.0	203.7	154.9	220.0	144.2
August	149.7	204.3	152.6	220.0	144.3
September	148.8	204.3	151.4	220.1	146.2
October	151.9	203.2	148.5	220.6	149.1
November	152.7	203.7	148.6	220.7	149.5
December	157.0	205.6	148.7	220.8	149.6
1925					
January	160.0	205.3	150.3	221.0	149.6
February	160.6	203.9	153.1	221.0	149.6
March	161.0	204.4	158.4	221.5	149.9
April	156.2	204.1	157.3	221.6	150.0
May	155.2	202.0	153.9	222.2	150.0
June	157.4	200.0	152.4	222.4	150.0
July	159.9	200.1	152.6	222.5	150.2
August	160.4	201.0	151.6	222.6	150.3
September	159.7	200.5	150.9	222.7	150.6
October	157.6	202.7	150.9	222.8	151.0
November	157.7	202.4	152.0	222.8	150.7
December	.....	202.2	153.9	223.0	150.7

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which may therefore be taken as an index of the cost of operating materials including power cost, when the latter is purchased under a coal clause. The remaining 60 per cent of the weighting of the materials index is made up of the costs of metals and metal products, lumber and building materials. The weighting of these individual items was determined upon after a careful study of the cost of materials used by a number of railway companies in various parts of the country over a period of years.

The Index of Electric Railway Wages as here shown is as computed monthly by the writer. The data used are the maximum wage rates of conductors and motormen on two-man cars on 144 companies in the United States, employing a total of 108,175 platform men. These rates are weighted on the basis of the number of platform men employed by the various companies; the index therefore indicates the trend of the average platform man's hourly rate of wage. Previous to October, 1924, this index was weighted according to the number of passenger cars operated by the various companies. As noted on page 787 of the JOURNAL for Nov. 1, 1924, the weighting then was changed to the number of platform men, as above described, and the index was recalculated for the years 1923 and 1924. Up until October of this year, 103 companies were included, but at that time, additional companies were added, bringing the total number up to 144, so that the index now includes all companies in the United States which employ more than one hundred platform men each. The addition of 41 companies, all of which were small in the number of men employed, made practically no change in the index numbers as published for the preceding three years, and consequently no revision has been made in the index numbers as previously published on account of the additional data used.

The Index of Street Railway Fares, as here shown, is as computed by the writer, and includes all cities in the country with a population of 50,000 or more, except New York City. The index is weighted in accordance with the population of the various cities, and the fares used are, as nearly as it is possible to determine them, the average in the various cities, including cash and regular ticket or token fares. Ticket or token rates used are those available to all riders at all times of the day; pupils', workmen's or other special forms of tickets are not included. Pass and free transfer riders are not included in arriving at the averages, but where a charge is made for a transfer such charge and the proportion of original riders paying it are considered. The multiplying factor between the Richey Fare Index as here presented (on the base of 1913 = 100) and the average fare in cents is 0.048425. The average fare in cents may be found for any month by multiplying the index number as here shown by that factor, which represents the average fare in 1913.

TRENDS SHOWN BY THE INDEXES FOR 1925

In the articles corresponding to this which were printed in the Statistical Issues of the JOURNAL for 1924 and 1925, attention was called to the apparent stabilization of electric railway costs, as compared with the large and rapid fluctuations in labor and material costs which characterized the years during and immediately following the world war. This tendency is again borne out by the figures for 1925.

The Wholesale Commodity Index averages several points higher than in 1924, its fluctuations during the year just passed having been between 155 and 161, while during the preceding year its average was 150.

The Electric Railway Construction Cost Index is still following the almost horizontal course started in the middle of 1923, although for the past seven months it has been 1 or 2 per cent lower than during the preceding two years. This is due primarily to a slight falling off in average rates paid for common labor, as there has been very little change in its other constituents.

The Index of Operating Materials Costs, which with some minor fluctuations followed a general downward trend from the middle of 1922 to the end of 1924, showed an increase during the first half of 1925, followed by a decline during the last half of the year, and an increase in December, so that at present it is 3½ per cent higher than a year ago.

The Index of Electric Railway Wages shows an increase during the year of 1 per cent, this being due principally to increases in Cleveland, Detroit, Philadelphia, Seattle, Minneapolis and St. Paul, and the Eastern Massachusetts Street Railway. With very few and minor exceptions, no other increases have been reported during the year, but there have been many renewals and extensions of existing rates. No decreases have been reported during the year. Wage increases have been granted, effective as of Jan. 1, 1926, in Buffalo and in Oakland; the effect of these changes will be to increase the index about 0.7 point or 0.3 per cent.

The Index of Street Railway Fares has increased slightly during the year. The weighted average fare was 7.24 cents at the beginning of the year. This rose to the peak in October, principally due to increases in Buffalo, Minneapolis, St. Paul, Omaha, South Bend, and the eastern Massachusetts cities. Since October, it has been slightly reduced by the reduction in fares in Cincinnati. The October index of 151.0, corresponding to an average fare of 7.31 cents, is the highest point which this index has reached. The previous peak was in October, 1921, when the index stood at 149.6, corresponding to an average fare of 7.24 cents. The increase in fares in Rochester, as of Jan. 1, 1926, will almost, if not quite, bring the index back to its peak of October, 1924.

Among other indexes regularly included in the monthly Conspectus but not charted or tabulated here, the General Construction Cost Index to the *Engineering News-Record* stands at 205.95 in December, a reduction of 2.63 points or 1¼ per cent since December, 1924; the average for the year 1925 is 206.68, which is 8.67 points or 4 per cent under the average for 1924. Bradstreet's Index of Wholesale Commodities, which stood at 9.2115 as an average for 1913, is 14.4054 on Dec. 1, 1925; this is an increase of 0.8765 point or 6½ per cent since December, 1924; the average for 1925 is 13.9445, which is an increase of 1.0773 points or 8½ per cent over the average for 1924. The United States Bureau of Labor Statistics Index of Retail Food Costs is 167.1 for November, 1925, an increase of 17 points or 11 per cent over the index for November, 1924. The Cost of Living Index of the National Industrial Conference Board is 171 for November, 1925, an increase of six points or 3½ per cent since November, 1924.

Of the indexes relating to general business conditions, the unfilled steel orders of the United States Steel Corporation were slightly in excess of 400,000 and 500,000 tons on Nov. 30, last, as compared with about 4,000,000 tons a year before; throughout 1925 the

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monthly reports of unfilled steel orders have exceeded the corresponding months of 1924 by amounts averaging 333,000 tons, or about 8½ per cent. The monthly reports of bank clearings outside of New York City also have consistently shown increases over 1924 throughout the year, while at least since March, the number of business failures as well as the liabilities have been less than during the same period in 1924. These indexes, as well as others relating to the state of general business, indicate slightly better conditions and more activity during 1925 than in 1924.

TREND OF OPERATING COSTS

In the résumé corresponding to this, which was printed in the Statistical Number of the JOURNAL a year ago, two of the Richey Indexes (operating material costs and wages) were combined to arrive at an indication of the trend of electric railway operating expenses. This was done under the assumption that a fair present distribution of operating expense is wages 62½ per cent, material 22½ per cent, and other expense 15 per cent. The "other" expense is that part of the operating expense which is neither wages nor material, such as salaries, general office expense, advertising, accidents, etc., and it was assumed that such "other" expense varies in the same ratio as wages and material combined. This combination also involves the assumption that all wages paid by the electric railways have varied the same as the wages of the platform men. With all of these assumptions, the 1925 change in average electric railway operating costs (exclusive of fixed charges) was as follows:

	Wages	Materials	Operating Expense
Index at end of 1924.....	220.8	148.7	201.7
Index at end of 1925.....	223.0	153.9	204.7
Increase during 1925, per cent	1.0	3.5	1.5

On this basis, then, which does not take into account such economies as those made possible by the one-man car, average electric railway operating expenses (not including fixed charges) in the United States at the end of 1924 were a little more than double those of 1913; during 1925 they increased 3 points, or 1½ per cent; and it may be noted that during the same periods the average street railway fares increased 50.7 per cent since 1913, and 0.74 per cent during 1925.

It should be borne very definitely in mind, in considering any of the figures shown or statements made in this article, that they are based on average conditions of the country as a whole, and that in specific locations or cities individual experience is quite likely to show different results. These country-wide trends, however, are of great value for comparison with individual experience.

Annual Table of Statistics of the Industry

IN ADDITION to the statistics contained in this issue, ELECTRIC RAILWAY JOURNAL publishes annually a table of general statistics of the electric railway industry, based on the McGraw Electric Railway Directory. This directory is published annually in February, and statistics from the February, 1925, directory were published in the issue of this paper for March 7, 1925.

The editors of this paper are now compiling the statistics for this annual table from the reports being received for the February, 1926, McGraw directory and hope to publish the results in tabular form in some issue of this paper during January. This table will show, as usual, by states, the number of operating electric railway companies, miles of track and number of passenger motor cars, passenger trail cars, electric locomotives, freight motor cars, freight trail cars, service cars and other types of cars owned by the electric railways in the United States.

Damages to Electric Railways by Earthquakes

ELECTRIC railway cars destroyed by the earthquake of Sept. 1, 1923, in Japan, totaled 955, according to a paper presented at the International Conference of Large Transmission Systems, held in Paris in June of this year. Practically all of these cars were destroyed by the fire following the earthquake. The actual damage done by the quake itself to the electric railways was mostly to the track and roadbed. Sinking of the roadbed occurred over a wide area. Movement of the roadbed naturally caused a corresponding movement of the poles, with some damage to the feeders and trolley lines. There was also considerable damage to bridges and culverts, but tunnels did not suffer much damage. That suffered was mainly at the entrances.

Within the built-up city areas, such as in Tokyo and Yokohama, fire followed the earthquake, causing the losses of cars already mentioned. The chief sufferer was the municipality of Tokyo, which lost altogether 534 double-truck cars and 290 single-truck cars.

By Sept. 1, 1924, more than a year after the disaster, the miles of track and number of electric cars in operation had returned to the status of before the earthquake.

Building a Bridge in a Day

WHEN the city of North Milwaukee decided to build a new bridge on 32d Street near Hampton Road it became necessary for the Milwaukee Electric Railway & Light Company to devise some way to keep the cars in operation over the creek while the new bridge was under construction. After considering several kinds of operation it was decided to construct a temporary bridge over the old bridge, allowing sufficient space in between the two structures so as not to interfere with the construction of the new bridge. During the night of Saturday, Sept. 12, sufficient material was delivered with which to construct this bridge, consisting mainly of piles, rails, 12-in. x 12-in. caps and ties.

On the morning of Monday, Sept. 14, actual work was started on the temporary bridge. Commencing at 8 o'clock the cars were stubbed on either side of the bridge, the trolley wire was shifted to one side and the pile driver was set up for the purpose of driving piles for the bents of the temporary structure, after which the old track, deck and old bridge were removed. By noon the piles for the three bents needed had been driven. The temporary track was supported on a deck, using eight 62-ft. 7-in. 102 T-rail, four being placed parallel and under each running rail of the bridge. About all that remained to be done was to place run-offs at each end of the bridge. These were made by using ties and timber, making an easy incline at each side. Temporary cross-over points were used to connect the temporary track with the permanent track. By 5:30 p.m. the trolley wire had been replaced and cars were operating over the new temporary bridge. —*Rail and Wire.*

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Receiverships Reduced in 1925

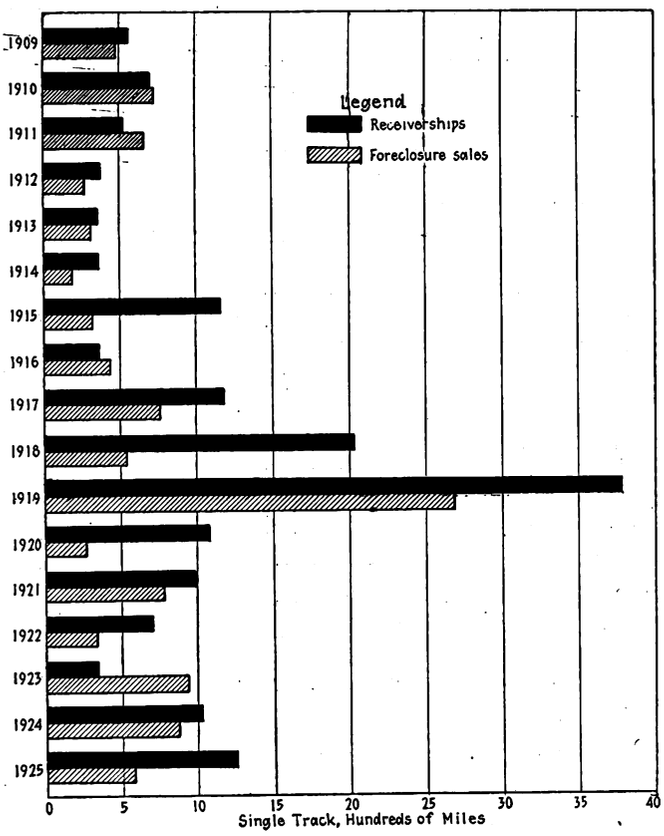
Fewer Roads Were Thrown in Receivership During the Year, Although the Failure of One Large Property Increased the Mileage Over That in 1924—Many Roads Restored to Their Owners, While Others Are on the Way to Terminate Receiverships Early This Year

WITH the number of electric railways in receivership gradually decreasing and reorganizations and merging of properties not in receivership the favorable outlook for the industry increases. There has been much activity along these lines during the past year, along with the trend toward co-ordination and strengthening the existing roads. While the number of miles of track involved is now about 4,165, slightly more than last year, there are fewer companies involved. Four companies comprising some 68 miles of track have gone through foreclosure proceedings and are now in the process of reorganization, but the final steps have not been perfected. These are therefore included in the table as still being in receivership.

The most important reorganization the past year was that of the Denver Tramway with 226 miles of single track, which becomes the Denver Tramway Corporation.

Another important reorganization was that of the Chicago, Lake Shore and South Bend Railroad, a 71-mile interurban. A receiver for this road was appointed on Feb. 28, the foreclosure sale took place June 29, and by July 13 it had been reorganized as the Chicago, South Shore & South Bend Railroad and the receiver discharged.

The Cleveland, Alliance & Mahoning Valley Railway was sold at receiver's sale to the Northern Realty Company, a subsidiary of the Northern Ohio Traction & Light Company, and is now operating as an important link in the freight handling of the latter company.



The Mileage of Electric Railways Going into Receiverships and Those Sold at Foreclosure Is Presented Graphically

Table I—Electric Railway Receiverships—1925

	Miles of Single Track Involved	Outstanding Securities—Stock	Bonds	Receivers' Certificates
Boston & Worcester Street Ry., Framingham, Mass.	83.00	$2,482,200	$2,520,000	None
Laconia Street Ry., Laconia, N. H.	8.00	140,000	91,000	None
Cumberland & Westenport Electric Ry., Frostburg, Md.	25.00	625,000	655,000	None
Binghamton Railway, Binghamton, N. Y.	49.52	978,895	2,812,825	None
Frankford, Tacony & Holmesburg Street Ry., Philadelphia, Pa.	16.18	500,000	400,000	None
Chicago, Lake Shore & South Bend Ry., Michigan City, Ind. (1)	70.86	6,000,000	4,692,000	None
Indianapolis & Cincinnati Traction Co., Indianapolis, Ind.	101.00	3,600,000	2,400,000	$112,000
Detroit United Ry., Detroit, Mich.	613.89	25,000,000	29,745,500	None
Wahpeton Breckenridge Street Ry., Breckenridge, Minn.	1.00	42,500	None	None
Tiffin & Fostoria Ry., Tiffin, Ohio	15.00	(2)	(2)	(2)
Helena Light & Railway Co., Helena, Mont.	18.50	935,000	878,000	None
Salt Lake & Utah Railroad, Salt Lake City, Utah	96.71	5,043,700	2,644,200	100,000
Oklahoma Railway, Oklahoma City, Okla. (3)	138.40	5,595,900	5,815,000	None
Tulsa Street Railway, Tulsa, Okla.	23.00	580,000	771,000	None
Total for 1925 (14 companies)	1,260.06	$51,523,195	$54,484,525	$212,000

(1) Receiver appointed Feb. 28, 1925. Property sold at foreclosure sale and reorganized as Chicago, South Shore & South Bend Railway. Receiver discharged July 13.
(2) Information not available
(3) Receiver appointed late in December, 1924.

Table II—Record of Electric Railway Receiverships

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities—Stock	Bonds
1909	22	558.00	$29,962,200	$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	321,259,354	312,915,104
1920	19	1,065.31	28,758,455	72,283,575
1921	19	986.42	32,909,525	36,177,800
1922	14	695.43	18,140,150	20,304,400
1923	12	333.63	8,332,100	14,707,066
1924	12	1,021.88	28,489,700	35,716,000
1925	14	1,260.07	51,383,195	54,696,525

(3) Receiver appointed late in December, 1924.

Table III—Record of Electric Railway Foreclosure Sales

Year	Number of Companies	Miles of Track Involved	Outstanding Securities—Stocks	Bonds	Receivers' Certificates
1909	21	488.00	$22,265,700	$21,174,000	(a)
1910	22	724.36	19,106,613	26,374,075	(a)
1911	25	660.72	91,354,800	115,092,750	(a)
1912	18	267.18	14,197,300	10,685,250	(a)
1913	17	302.28	15,243,700	19,094,500	(a)
1914	11	181.26	26,239,700	44,094,241	(a)
1915	19	308.31	30,508,817	16,759,997	(a)
1916	19	430.14	13,895,400	22,702,300	(a)
1917	26	745.19	27,281,900	27,313,045	(a)
1918	23	524.22	37,740,325	20,149,384	(a)
1919	29	2,675.48	89,893,400	79,836,738	$42,300
1920	13	259.90	7,782,400	11,227,328	52,000
1921	13	777.97	33,642,255	30,863,526	5,000
1922	13	322.88	7,491,500	12,640,600	114,683
1923	15	927.45	118,077,959	110,638,250	12,265,000
1924	14	869.25	21,022,800	34,845,535	3,440,388
1925	13	569.39	18,074,300	18,329,555	53,000

(a) Data not available.

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Table IV—Electric Railway Receiverships as of Dec. 31, 1925

New England States	Year of Receiver-ship	Miles of Single Track	Outstanding Securities: Capital Stock	Funded Debt	Receivers' Certificates
CONNECTICUT					
Danbury & Bethel Street Ry., Danbury	1917	13.00	$320,000	$588,500	$100,000
Hartford & Springfield Street Ry., Warehouse Point	1918	48.00	785,000	961,000	None
MASSACHUSETTS					
Boston & Worcester Street Ry., Framingham	1925	83.00	2,482,200	2,520,000	None
Connecticut Valley Street Ry., Greenfield (1)	1921	47.05	620,000	580,000	None
Milford, Attleboro & Woonsocket Street Ry., Springfield (2)	1924	29.73	315,000	300,000	None
NEW HAMPSHIRE					
Laconia Street Ry., Laconia (3)	1925	8.00	140,000	91,000	None
Portsmouth, Dover & York St. Ry., Portsmouth	1917	12.00	.....	707,000	30,000
VERMONT					
Barre & Montpelier Traction & Power Co., Montpelier	1920	9.75	120,000	100,000	None
Net receiverships Dec. 31, 1925, 8 Cos.		250.53	4,782,200	5,847,500	130,000
Eastern States					
DISTRICT OF COLUMBIA					
Washington-Virginia Ry.	1923	40.00	2,378,300	5,614,000	None
MARYLAND					
Cumberland & Westernport Electric Ry., Frostburg	1925	25.00	625,000	655,000	None
NEW JERSEY					
North Jersey Rapid Transit Co., Hohokus	1912	18.00	800,000	800,000	None
Morris County Traction Co., Morristown	1923	68.98	300,000	4,179,000	None
NEW YORK					
Binghamton Ry., Binghamton	1925	49.52	978,895	2,812,825	None
Brooklyn Heights R.R., Brooklyn	1919	5.12	200,000	250,000	None
Buffalo & Lackawanna Traction Co., Buffalo	1918	8.80	55,000	1,000,000	None
Hamburg Railway, Buffalo	1920	21.72	None	750,000	None
Hornell Traction Co., Hornell	1917	10.90	117,900	150,000	2,000
Long Island Electric Ry., Jackson Heights	1924	24.97	600,000	600,000	None
Ithaca Traction Corporation, Ithaca	1924	11.62	400,000	763,000	None
New York & Long Island Traction Co., Jackson Heights	1923	50.76	1,000,000	1,000,000	None
New York & Queens County Ry., Jackson Heights	1923	43.65	3,235,000	1,500,000	None
Manhattan & Queens Traction Corp., Long Island City	1917	21.66	20,000	25,946	None
Second Avenue R.R., New York	1908	26.35	1,862,000	5,720,000	3,140,000
Staten Island Midland Ry., New York	1920	28.68	1,000,000	1,000 000	3 000
Steinway Railway, New York	1922	31.11	None	1,500,000	None
Westchester Street R.R., New York	1920	16.32	700,000	168,000	None
Penn Yan & Lake Shore Ry., Penn Yan	1918	8.50	94,000	100,000	None
Ogdensburg Street Ry., Potsdam	1922	7.74	150,000	150,000	None
PENNSYLVANIA					
North Branch Transit Co., Bloomsburg	1915	30.00	500,000	532,500	45,000
Net receiverships Dec. 31, 1925, 21 Cos.		549.40	15,016,095	29,270,271	3,190,000
Central States					
ILLINOIS					
Alton, Granite & St. Louis Traction Co., Alton	1920	62.00	3,189,000	3,000,000	None
Chicago & Interurban Traction Co., Chicago	1922	50.00	1,000,000	1,816,000	None
Peoria Railway Terminal Co., Peoria (4)	1922	25.28	1,000,000	2,444,000	None
INDIANA					
Union Traction Company of Indiana, Anderson	1924	450.53	11,500,000	15,381,000	None
Ft. Wayne, Van Wert & Lima Traction Co., Ft. Wayne	1921	61.63	1,000,000	1,470,000	None
Indianapolis & Cincinnati Traction Co., Indianapolis	1925	101.00	3,600,000	2,400,000	112,000
KENTUCKY					
Owensboro City Railroad, Owensboro	1923	12.50	75,000	400,000	None
MICHIGAN					
Detroit United Ry., Detroit	1925	613.89	15,375,000	29,745,500	None
Grand Rapids, Holland & Chicago Ry., Jackson	1924	80.93	1,324,700	1,500,000	None
Houghton County Traction Co., Houghton	1921	32.15	957,200	660,000	None
Michigan Railroad, Jackson	1924	173.84	4,000,000	8,050,000	None
MINNESOTA					
Wahpeton-Breckenridge Street Ry. (7)	1925	1.00	42,500	None	None
St. Paul Southern Electric Ry., Hastings	1918	17.54	658,225	425,400	None
Mesaba Railway Co., Virginia (5)	1924	38.00	2,260,000	1,581,000	10,000
MISSOURI					
Kansas City, Lawrence & Topeka Electric Ry., Kansas City	1919	12.00	250,000	400,000	None
Kansas City Railways, Kansas City	1920	318.04	100,000	29,959,316	None
Missouri Electric Railroad, St. Louis	1919	20.97	1,000,000	700,000	None
United Railways Company of St. Louis	1919	463.18	41,296,000	50,690,000	4,200,000
OHIO					
Cincinnati, Lawrenceburg & Aurora Electric Street R.R., Cincinnati	1913	31.67	808,900	750,000	None
Dayton, Springfield & Xenia Southern Ry., Dayton	1923	27.97	500,000	422,400	None
Cincinnati & Dayton Traction Co., Hamilton	1920	91.07	1,250,000	3,250,000	None
Hocking-Sunday Creek Trac. Co., Nelsonville (6)	1923	14.99	223,000	300,000	None
Indiana, Columbus & Eastern Traction Co., Springfield	1921	201.49	4,025,000	7,900,000	200,000
Tiffin & Fostoria Ry., Tiffin	1925	15.00	(8)	(8)	(8)
Dayton, Covington & Piqua Traction Co., West Milton	1922	34.00	1,150,000	550,000	18,000
Net receiverships Dec. 31, 1925, 25 Cos.		2,950.67	96,584,525	163,794,616	4,540,000
Western States					
KANSAS					
Kansas City, Kaw Valley & Western Ry., Bonner Springs	1924	42.31	740,500	1,374,500	None
Joplin & Pittsburg Railway, Pittsburg	1924	94.52	7,000,000	3,078,500	None
MONTANA					
Helena Light & Railway Co., Helena	1925	18.50	935,000	878,000	None
OKLAHOMA					
Oklahoma Railway, Oklahoma City	1924	138.45	5,595,900	5,815,000	None
Tulsa Street Railway, Tulsa	1925	23.00	580,000	771,000	None
UTAH					
Salt Lake & Utah R.R., Salt Lake City	1925	96.71	5,043,700	2,644,200	100,000
Net receiverships Dec. 31, 1925, 6 Cos.		413.49	19,895,100	15,561,200	100,000
Recapitulation for United States					
Net receiverships Dec. 31, 1925, 60 Cos.		4,164.09	136,277,920	213,473,587	7,960,000

(1) Practically all the property has been liquidated but receiver not yet discharged.
(2) All the property has been sold and assets are being distributed. Receiver not yet discharged.
(3) Sold at foreclosure sale.
(4) Foreclosure sale advertised for Jan. 6, 1926.
(5) Receiver appointed March 7, 1924.
(6) Sold at foreclosure sale Dec. 4, 1925. Now under process of reorganization.
(7) Operations permanently abandoned.
(8) Information not available.

The passenger business on this road is small, but as a freight carrier it is of much importance in establishing through service.

The Columbus, Newark & Zanesville Traction Company, comprising 91 miles of track, was reorganized early in the year as the Southern Ohio Public Service Company.

Three small roads discontinued operation, receivers were discharged and the properties were dismantled. These were the Port Jervis Traction Company with a mileage of 4.78; the Alamance Railway, 8.40 miles, and the Charleston-Isle of Palms Traction Company, 9 miles; a total of 22 miles.

The New York Railways is shown as having terminated its receivership. This property was reorganized in 1924 and has been operated by the New York Railways Corporation for more than a year. Due to a technicality the receiver has not been formerly discharged by the court, but as the old company is no longer an operating company it has been shown as emerging from receivership.

A complete story of the rehabilitation of the Interstate Consolidated Street Railway, Attleboro, Mass., was published in the Aug. 29 issue of this paper, page 321. The Toledo & Western Railroad was purchased outright at foreclosure sale by the Toledo & Western Railway and is now being operated as an important part in the latter's transportation service. Only two railways in Florida were in receivership at the beginning of the year, The Jacksonville Traction Company and the Pensacola Electric Company. Both of these roads terminated their receiverships during the year and have been restored to their owners.

The mileage of roads going into receivership this year was greatly increased by the appointment of a receiver for the Detroit United Railway, about 614 miles of track being involved in this one. Operations of the property have been materially curtailed since the lines in Detroit were sold to the city some two years ago.

Two other roads of more than 100 miles went into receivership during the year. The Oklahoma Railway,

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Table V—Receiverships Terminated and Foreclosure Sales During 1925

Receivers Discharged With or Without Foreclosure Sales or Following Abandonment	Miles of Single Track Involved	Outstanding Securities — Stocks	Bonds	Receivers' Certificates	
Interstate Consolidated Street Ry., Attleboro, Mass. (1)...	25.97	$275,000	None	None	Sold at foreclosure sale in 1925 and reorganized as Interstate Street Railway
Northern Massachusetts Street Ry., Greenfield, Mass.....	44.09	500,000	500,000	.....	Property liquidated and receiver discharged Dec. 12
New York Railways, New York, N. Y.....	85.01	17,495,060	48,673,027	None	
Port Jervis Traction Co., Port Jervis, N. Y.....	4.78	30,000	70,000	None	Road has been dismantled.
Slate Belt Transit Co., Pen Argyl, Pa.....	18.00	180,000	180,000	None	Reorganized and receiver discharged.
Frankford, Tacony & Holmesburg St. Ry., Philadelphia, Pa.	16.18	500,000	400,000	None	Purchased and operated by the Philadelphia Rapid Transit Company.
Beech Grove Traction Co., Indianapolis, Ind.....	3.90	150,000	100,000	None	Property sold at receiver's sale and reorganized as Beech Grove Traction Corporation.
Chicago, Lake Shore & South Bend R.R., Michigan City, Ind.	70.86	6,000,000	4,692,000	None	Sold at foreclosure sale and reorganized as Chicago, South Shore & South Bend R.R.
Maumee Valley Ry., Perrysburg, Ohio.....	23.21	1,000,000	800,000	None	Receiver discharged
Ohio River Electric Railway & Power Co., Pomeroy, Ohio...	13.79	300,000	315,000	None	Property sold and reorganized as Ohio River Railway & Power Co.
Cleveland, Alliance & Mahoning Valley R.R., Ravenna, Ohio, 1920.....	46.00	1,100,000	1,100,000	8,000	Purchased at receivers' sale by Northern Realty Co., a subsidiary of Northern Ohio Traction & Light Co., and operating as freight interurban.
Toledo & Western R.R., Toledo, Ohio.....	89.00	2,000,000	2,000,000	None	Purchased by the Toledo & Western Railway at foreclosure sale.
Columbus, Newark & Zanesville Traction Co., Springfield, O.	91.05	2,025,000	4,704,000	190,000	Reorganized as the Southern Ohio Public Service Co.
Jacksonville Traction Co., Jacksonville, Fla.....	60.00	1,500,000	3,267,000	128,791	Receiver discharged.
Pensacola Electric Co., Pensacola, Fla.....	24.49	1,100,000	1,721,770	None	Purchased by Southeastern Power & Light Co. Receiver discharged Feb. 10.
Valdosta Street Ry., Valdosta, Ga.....	5.00	50,000	1,500	$383	Receiver discharged
Alamance Railway, Burlington, N. C.....	8.40	60,000	120	None	Road has been dismantled.
Charleston-Isle of Palms Traction Co., Charleston, S. C.....	9.00	527,000	250,000	None	Company liquidated and operations ceased.
Denver Tramway Co., Denver, Colo.....	226.14	6,156,300	17,351,710	None	Receiver discharged and reorganized as Denver Tramway Corporation.
Total of receiverships terminated (19 companies).....	864.87	$40,948,360	$86,126,127	$319,174	
Foreclosures but Receivers Not Yet Discharged					
Laconia St. Ry., Laconia, N. H.....	8.00	$140,000	$91,000	None	
North Branch Transit Co., Bloomsburg, Pa.....	30.00	500,000	532,500	$45,000	
Hocking-Sunday Creek Traction Co., Nelsonville, Ohio....	14.99	223,000	300,000	None	Foreclosure sale Dec. 4. Now being reorganized as Nelsonville-Athens Electric Ry.
Tiffin & Fostoria Ry., Tiffin, Ohio.....	15.00	.....	.....	.....	Information not available.
Total of foreclosure sales without receivers' discharge (4 companies).....	67.99	$863,000	$923,500	$45,000	
Foreclosures Without Receiverships in 1924					
Phoenixville-Valley Forge & Strafford Electric Ry., Phoenixville, Pa.....	5.50	.....	.....	.....	Information not available.
Mt. Manitou Park & Incline Ry., Colorado Springs, Colo.	1.25	130,000	125,575	None	
Gainesville Ry., Gainesville, Ga.....	10.00	.....	.....	.....	Service abandoned.

138.4 miles, and the Indianapolis & Cincinnati Traction Company, 101 miles. Next to these in importance are the Salt Lake & Utah Railroad, the Boston & Worcester Street Railway and the Chicago, Lake Shore & South Bend Railway, mentioned in a foregoing paragraph.

Next to the Detroit United Railway the largest properties remaining in receivership at the close of last year are the United Railways of St. Louis, with a total of 460.93 miles, and the Kansas City Railways, with 314.88 miles. Both of these companies are now in the process of reorganization. It was planned to sell the Kansas City property at foreclosure on Dec. 15 but it has been found necessary to postpone the sale until early this month. The reorganization plan has been approved by a large majority of the security holders and is acceptable to the court. The St. Louis company will undoubtedly perfect its reorganization plans and emerge from receivership during this year.

Super-Highway Plan Progressing in Detroit

POPULAR attention was vividly attracted to a suggestion made by the Detroit Rapid Transit Commission, a little more than a year ago for the construction of a system of super-highways, each 212 ft. wide and extending from Detroit radially in a number of directions. The plan was described on page 52 of the issue of this paper for July 12, 1924. Recently two more reports bearing on this subject, but relating more particularly to means for expediting traffic downtown, have been presented to the city authorities. One of these was an analysis of traffic conditions on a number of Detroit business streets made by the Rapid Transit Commission. The other was a report entitled "Carrying Out the Master Plan" by an advisory committee, made up of the corporation counsel, the prosecuting attorney of Wayne County, the Board of County Auditors, the City Plan Commission and the Rapid Transit Commission.

The former report summarizes the traffic conditions of the Grand Boulevard and streets leading to it on June 19, 1925, for a period of twelve hours from 7 a.m. to 7 p.m. The Grand Boulevard belts the city at a distance of about 3 miles from the center and is 11 miles long. Everywhere it is 150 ft. wide and in some places 200 ft. wide, and the Rapid Transit Commission says that it is an example of far-visioned city planning that may well serve as an inspiration to those responsible for the present planning of the city of the future. It has now come to be one of the most used traffic arteries of the city, articulating as it does with all the radial avenues which are characteristic of the city plan of Detroit.

It is found that at times the movement of traffic on the Boulevard amounts to 679 vehicles per traffic lane. This number is near the point of saturation, which is believed to be 800 vehicles per traffic lane under the present "Stop and Go" regulations. To improve conditions, the commission recommends the widening of a number of streets and opening of others, the most important being the development of Vernor Highway to be 150 ft. wide at points and 120 ft. wide at other points, extending north and south through the city, at a cost of $5,279,000.

The report of the advisory committee approved this plan and discussed the legislation necessary and the cost for this and other proposed improvements.

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The News of the Industry

Seven-Cent Ticket Rate in Spokane

Application for a 10-cent cash and a 7-cent ticket fare to become effective on Feb. 1, 1926, was filed by the Spokane United Railways, Spokane, Wash., on Dec. 28. Unless a protest is made the fare will become effective automatically. The comany had petitioned for a 10-cent cash fare, with a ticket rate of thirteen for $1 or 7.69 cents each. Under the new tariff filed five tickets would be sold for 35 cents. State officials indicated that the Spokane United Railways management and the City Council of Spokane had reached an agreement on this rate.

Formal notice was filed on Oct. 16 with the Mayor and the City Commissioners of Spokane to the effect that the Spokane United Railways intended filing a schedule for increased rates with the Department of Public Works of the State of Washington calling for a 10-cent cash fare, a 7.69-cent ticket rate and with school tickets remaining at 4 cents. Stern opposition to the proposed increase was voiced by Charles A. Fleming, Mayor and Commissioner of Public Utilities of the city, in his report to the City Council on Nov. 5. The present rate is 7 cents cash with a 6-cent ticket rate.

Ordinance Looks Toward Cleveland Subway

Petitions for an initiated ordinance, to float a $30,000,000 bond issue for subways in Cleveland, are in circulation. The movement was started by Councilman Peter Witt, formerly city street railway commissioner. Five thousand signatures are needed to put the ordinance before the City Council. The petition calls for three lines, one across Superior Avenue from the easterly limits of the city, via the high level bridge and Clifton Avenue on the west side; a second running westerly from Cedar Avenue and East Boulevard, on the east side, to University Circle, west on Euclid to Huron Road and over the proposed Huron-Lorain bridge to West 35th Street, and a third northerly from East 93d Street and Miles Avenue, to Buckeye Road and northwesterly to Woodland Avenue and to the Public Square. Mr. Witt's idea is to pay off the bonds in 25 years and to have them bear 6 per cent interest.

Mayor Signs $1,200,000 Offer for Rainier Line

Mayor Edwin J. Brown recently signed the ordinance passed by the City Council of Seattle, Wash., binding itself to an offer of $1,200,000 for the lines of the Seattle & Rainier Valley Railway. Immediately a referendum move was started to put the deal to a vote of the citizens of Seattle. Petitions for such a referendum have been circulated by those residents of Rainier Valley who oppose the purchase. As a countermove, residents of the valley who favor the purchase, and who claim to be 98 per cent of the residents, issued postcards to all Seattle voters urging against the referendum and requesting voters not to sign the petition. The card points out that "purchase will give the city monopoly of street railway transportation, assuring valley residents equal rights and privileges with the rest of the city." The campaign for referendum is headed by E. F. Blaine, former chairman of the State Public Service Commission, aided by E. F. Markham, president of the Rainier Valley Commercial Club.

Pay of Connecticut Men Unchanged

Arbitrators Continue Base Rate at 60 Cents, but Increase Bus Men 3 Cents—Shop Men Benefited—Minority Report to Be Filed —Company Sought Reduction

THERE will be no increase in pay for trainmen of the Connecticut Company, New Haven, but 3 cents additional an hour has been awarded to bus operators. This establishes a differential of 10 cents an hour for bus operators over the basic rate of 60 cents an hour, instead of the present 7-cent differential. It represents the finding of the board of arbitration, concurred in by the neutral arbitrator and the arbitrator for the company. The member of the board chosen by the men dissented. The finding was made public on Dec. 22.

The request of the men that the right of seniority be extended to include the operation of buses was denied by the board on the grounds that "it would result in great injustice to the present motor bus operators if their right to maintain their present jobs should be taken away . . .," and further that "the offer of the company to extend the right of seniority to the trolley operators in all cases where any vacancy hereafter occurs in existing bus lines and to all new buses hereafter put in operation, is an eminently just and fair one and is hereby sustained."

Other Slight Changes

The award of the board effected another slight change in wages, concerning only about twenty men, in that it established that all shop and power station employes, some of whom are now receiving less pay than others for the same work, should be paid an equal wage and that this should be the highest rate now paid by the company in these various lines.

An unusual feature of the award is that the bus operators, receiving the only wage increase, made no demand for a rate of pay higher than the one-man trolley operators. About 100 bus operators are affected by the increase and with the retroactive provision they will receive approximately $50 each in back pay.

As set forth in the award the present rates of pay to trolleymen are as follows: 53 cents an hour for the first three months of employment; 56 cents an hour for the next nine months, and thereafter 60 cents an hour as the general basic rate, plus a differential rate of 7 cents an hour for operators of one-man cars and buses.

The demands of the men were that these rates be increased to 70 cents in the first instance; to 72 cents in the second and 75 cents in the third, the basic rate. They demanded that the differential rate for one-man car and bus operators be made 15 cents above the basic rate.

The Connecticut Company sought to reduce the wage scale to 47 cents in the first instance, to 51 in the second and to 55 in the third or basic rate. The company asked for a reduction of the differential rate to 5 cents above the basic rate.

In reviewing the claims of each side the arbitration board found that the men claimed there had been a shortage or "lag" in pay over a period of twelve years and that the rate should be increased so this amount would be made up over the same period of time. The Connecticut Company claimed there should be a reduction in the future because of the "excess" of actual earnings now over the cost of living during the same period.

The board held that neither claim was valid because of arbitration agreements covering the years from 1921 to 1925, which precluded bringing up such questions again, the legal theory of arbitration being that the disposition of its subject matter is final.

The decision was written by Charles Kleiner of New Haven, neutral member and chairman of the arbitration board which included Joseph F. Berry, Hartford, representing the Connecticut Company, and James H. Vahey, Boston, representing the union. Mr. Berry added his signature to the finding which was signed by Mr. Kleiner, and the award with its requirement of two signatures becomes final.

Mr. Vahey did not sign the finding. It is expected that he will file a minority decision.

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"We Are"—"Will You" Slogan in Allentown

The Lehigh Valley Transit Company, Allentown, Pa., is conducting an intensive safety campaign through its general safety committee. The members of the committee are visiting personally all owners and operators of trucks in the territory of 218 miles of track traversed by the company and are talking to people on the street corners and in the cars. The members of the committee are designated by an arm band with large green letters, "General Safety Committee L. V. T. Co." Talks have been given before all the luncheon, civic and woman's clubs in the entire district. Newspaper articles have appeared periodically. Mass meetings of the men have been held, with addresses by the mayors and other officials of the various cities.

At the mass meeting of the men held on Dec. 18 in the assembly hall of the company four prizes were awarded for the best safety suggestions brought in by the men. One of the prizes was awarded for a slogan which will be adopted by the company and used on the cars of the company after the first of the year. The slogan is as follows:

WE ARE
WILL YOU
?
ASK THE
MOTORMAN OR CONDUCTOR

All employees will wear buttons with this slogan on it, "the object being, we are working to safeguard the highways, will you co-operate with us?" Another prize was awarded for a poem entitled "The Head-Gear." This was composed by one of the conductors. This poem is appearing in the newspapers over the entire system of the company.

The drive has been one of the most successful and the most interesting that has ever been conducted by the company. It is under the direct supervision of H. F. Dicke, vice-president and general manager, and E. C. Spring, general superintendent.

Key System Passengers Questioned About Riding Habits

In an effort to solve two transportation problems affecting the East Bay cities of California the State Railroad Commission has drawn up a questionnaire for passengers traveling to and from Oakland and San Francisco on ferryboats of the Key System Transit Company and the Southern Pacific Company.

It is hoped that the answers to this questionnaire will shed light on the contention of the Key company officials, who are seeking increased ferry and car fares, that the fares now being collected are too low for the average trip mileage and that they also will answer the question as to whether the Key company is over supplied with ferryboats.

Four questions are being put to ferry passengers:

1. Is this a single trip or are you traveling upon commute or free ticket?
2. At which street or station do you leave the train?
3. After leaving the train what is your immediate destination and that is near the intersection of what street?
4. If you use a street car to complete your trip, what is the number or letter of the route used?

Since the Key company ordered two new ferryboats built recently the contention has been raised that the company does not need them, that it already has too many boats and that it maintains an uneconomical service throughout the day, with the result reflected in the net revenues and a demand for higher ferry fares.

To this Key company officials have replied that some of their old boats now in service cost so much to maintain that it has been deemed an economy to buy new ones to replace them.

Making the Punishment Fit the Crime

Drivers of motor vehicles in Buffalo, N. Y., who approach within 7 ft. of a standing street car are being arrested for violation of the traffic ordinances as the result of a campaign started by the Buffalo *Courier*, a newspaper, with the co-operation of the police department and the International Railway. The railway reproduced a cartoon published in the *Courier* showing the 7-ft. safety zone around standing street cars and these were displayed on cards attached to the front and rear ends of every street car in the city. Fines have been imposed upon several hundred motorists in this campaign, with the result that accidents resulting from drivers injuring passengers boarding and alighting have been materially reduced.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 6—American Society of Civil Engineers, Engineering Societies Building, 29 West 39th Street, New York, N. Y.

Jan. 8 — Metropolitan Section A. E. R. A., Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8 p.m.; Informal dinner, Keen's Chop House, 72 West 36th Street, 6:15 p.m.

Jan. 14-15 — Kentucky Association of Public Utilities, Annual Meeting, Brown Hotel, Louisville, Ky.

Jan. 20-21—Central Electric Traffic Association, Miami Hotel, Dayton, Ohio.

Jan. 22-23—Central Electric Railway Accountants' Association, Miami Hotel, Dayton, Ohio.

Jan. 26-29—Society of Automotive Engineers, Annual Meeting, Detroit, Mich.

Jan. 27—New York Electric Railway Association, Hotel Commodore, New York, N. Y.

Jan. 28-29—Central Electric Railway Association, Lincoln Hotel, Indianapolis, Ind.

Feb. 11—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

$12,000,000 Electrification for Long Island

Vice-President Le Boutillier of the Long Island Railroad on Dec. 24 laid plans before Chief Engineer Randolph Nixon of the Public Service Commission for further electrification of the Long Island from 1926 to 1929 at a cost of $12,600,000.

The improvements follow:

In 1926, electrification of the Bay Ridge Division and the Bay Ridge yards, $4,040,000.

In 1927, electrification of the Montauk Division, from Long Island City to Holban yards and the yards at Long Island City, Blissville, Fresh Pond and Holban, $6,010,000.

In 1928, electrification of freight sidings on the North Side Division, the main line between Long Island City and Jamaica and on the Atlantic Division, $1,205,000.

In 1929, electrification of the remainder of freight sidings in territory now electrified for passenger service, $595,000.

With the exception of $710,000 in 1926 for seven electric locomotives for electrification of the Floral Park-Mineola extension from Hempstead Crossing to Valley Stream, Mr. Le Boutillier said the proposed expenditures have to do with freight lines only.

Wage Increase on Illinois Traction

A flat wage increase of 5 cents an hour, an increase of ½ cent in the mileage rate and 50 per cent increase in overtime with the provision that the present closed shop be maintained, are the terms of the new agreement between the Illinois Traction System and its trainmen. Under the new schedule the pay of motormen, conductors and brakemen will be from 55 to 70 cents an hour. The old agreement expired on Nov. 30, but the men continued at work pending an adjustment. Their contract provides that there shall be no interruption of service while negotiations on a new contract are under way. It is understood that the wage settlement applies only to the main line of the Illinois Traction System, which is exclusive of what is known as the Illinois Valley Division, which runs from Ottawa west.

On the Air with P.R.T.

After the Philadelphia captain of industry, his day at the office finished, has donned the old carpet slippers and stoked up the favorite pipe he can now tune in on station WLIT and hear the versatile artists of the Philadelphia Rapid Transit Company in action. Even to these lengths have the efforts toward building up a lasting spirit of public good will gone.

With the installation of a radio control room at its carhouse at Tenth and Luzerne Streets the P. R. T. made its opening bow to the radio public on Dec. 2. An unusually well-rounded program was given, over a period of two hours, by the P. R. T. Brass Band of 110 pieces, one of the largest industrial bands in the country; the P. R. T. String Club, of 25 instruments; the Temport Serenaders, a twelve-piece jazz orchestra which has made quite a name for itself in playing for various dances of the employees, and a mixed quartet. It is planned to continue the concerts on alternate Wednesday evenings.

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Construction Work in Buffalo Ordered

The Public Service Commission under an order issued on Dec. 28 directs the International Railway, Buffalo, N. Y., as follows:

On or before July 1, 1926, to complete reconstruction of its tracks in Grant Street.

On or before Sept. 1, 1926, to complete reconstruction of its tracks in Walden Avenue from the east side of Genesee Street to the New York Central Railroad undercrossing.

On or before Nov. 1, 1926, to complete reconstruction of its tracks in Walden Avenue from the Erie Railroad undercrossing to the Delaware, Lackawanna & Western Railroad undercrossing.

The city, under a complaint filed, asked for an order to compel the railway to reconstruct the pavement in Main Street from Hertel Avenue to the city line and in Walden Avenue and Grant Street, it having entered into contracts for repavements, and had notified the railway to repave between and for 2 ft. outside its tracks. Commissioner Pooley, the sitting commissioner, in a memorandum approved by the commission, says the commission is not concerned with the question of repavement, that being governed by law requiring the railway to keep in permanent repair that part of the street occupied by it, and in case of neglect by the company the city can do the work at the expense of the company.

The commission says:

We are concerned, however, with regard to the manner in which street car lines are conducted and operated and with respect to adequacy, security and accommodations afforded by their service, and the scope of this investigation has been confined to a consideration of the safety of the tracks in question with respect to transportation of passengers.

Last Staten Island Line Electrified

The Staten Island Rapid Transit Company completed on Dec. 24 the electrification of its passenger train service. On Dec. 25 it operated its first electric train over the north shore division from St. George to Arlington.

Operations over the electrified system were initiated by General Superintendent M. L. McElheny. Officials of the company made the first trip. The new electric trains will reduce by four minutes the running time over the north shore division. The only steam locomotives still in operation by the company will be used to haul freight.

$98,000 Asked for Preparatory Work for Pittsburgh Subway

The recently created Department of Rapid Transit of Pittsburgh, Pa., has requested the City Council for twenty new positions with salaries totaling $60,884 annually. Besides, the department has asked for $13,116 for general expenses and special services and $24,000 for consulting engineer's fees and expenses. The appropriation request for next year aggregated $98,000. The Rapid Transit Department was created to supervise all city-owned transportation facilities, particularly the proposed $6,000,000 subway. Officials of the department, appointed last September, all serve without pay. A letter which accompanied the request for the appropriation said the estimates were based on the assumption that the Council, as a result of recommendations of the Traffic Commission, would take action soon to authorize subway construction.

Increase in Fare Asked in Shreveport

A petition for a change in rates for Shreveport, La., has been filed with the Louisiana Public Service Commission by the Shreveport Railways. The petition is an amendment to an original petition asking an 8-cent fare with a 4-cent fare for children.

The new rate asked is a straight fare of 7 cents for adults and 3½ cents for school children. The present rate is 7 cents cash fare, four tickets for 25 cents or seventeen for $1. School children pay a 2½-cent fare.

Capt. H. B. Hearn, president of the Shreveport Railways, announced that the company plans to increase service and to make other improvements.

Receiver Confident St. Louis Will Be Just

Rolla Wells, receiver for the United Railways, St. Louis, Mo., in a series of addresses to the employees in recent weeks, has expressed the belief that the public of the city will receive favorably an application from the company for a new franchise with a rate of fare sufficiently high to compensate capital for investing in the railway.

He has pointed out that the reorganization plan is fair to the public and that the public in turn should be fair to the investors in the railway's securities. In this connection he pointed out that the stockholders of the United Railways have not had a dividend in years and that it is manifestly unfair to ask the man who by his investment provides railway facilities to serve the public without pay.

In conclusion he expressed the belief that the changed attitude on the part of patrons, press and city officials toward the United Railways will result in the enactment of a franchise which will make possible the best railway service St. Louis has had in years.

News Notes

Traction Employee to Be Tried.—The trial of Harry H. Hershey, charged with embezzlement of $41,000 from three utility companies of Lancaster, Pa., will be held in the January term of court. Mr. Hershey was an employee of the accounting department of the Conestoga Traction Company.

Affirms Old Order.—The Public Service Commission on Dec. 28 affirmed its order made in January, 1925, in the matter of the operation of one-man cars by the International Railway in Buffalo. The order which dismissed the complaint of the city of Buffalo against the use of one-man cars and suggested supplemental rules for safety was reviewed in the ELECTRIC RAILWAY JOURNAL of Jan. 17, page 116.

Christmas Bonus Awarded at Nashville.—The management of the Nashville Railway & Light Company, Nashville, Tenn., played Santa Claus to its employees recently by distributing $3,240 in bonuses to men who have led the field in safe operation during the past three months. This amount made the year's total given to operating employees $11,222. Sharing this gift were 119 motormen and operators who had operated three months without an accident. They had attended every safety meeting held by the company. With them were 107 conductors.

Fares Advanced at Joplin.—The City Commission of Joplin, Mo., on Dec. 22 adopted a resolution to grant the Joplin & Pittsburg Railway an increase in street car and bus fares from 5 to 7½ cents. The new rate will be in effect during a trial period of six months, starting on Jan. 1. The proposal for increased fares was made by a committee of the Chamber of Commerce after it had studied the local transportation problems.

Fare Lowered.—The Public Utilities Commission of the District of Columbia has authorized the Capital Traction Company, Washington, D. C., to reduce the rate of fare on its Chevy Chase Loop bus line to 5 cents, with twenty tickets to be sold for $1. No transfer privileges will be extended to the users of this ticket.

Short Time Grant Sought.—Negotiations looking toward a short-time franchise for the Canton-Akron interurban line of the Northern Ohio Traction & Light Company have been started by A. C. Blinn, general manager. He asked the county for permission to operate without a franchise until 1927. The commissioners refused the request and declared they would give the company until Jan. 11 to obtain consent of a majority of the property owners for a renewal of the franchise. Mr. Blinn agreed to accept a new franchise if it specifically stated operation could be abandoned any time at the discretion of the management.

Wages Advanced Five Cents.—Employees of the Jacksonville Traction Company, Jacksonville, Fla., have received a pay increase of 5 cents an hour effective on Jan. 1. This increase is in addition to the 3 cents an hour granted in September. J. P. Ingle, general manager of the company, in announcing the boost said that the total of 8 cents over the 1925 scale would amount to $70,000 during 1926. Mr. Ingle said the increase was decided on as the result of the increased living costs in Florida. It will result in the average trainman of the company receiving approximately $165 per month.

Polite System Introduced—The Arkansas Central Power Company, Little Rock, Ark., has put its employees under the polite code, with a card bearing the car operator's name placed above the motorman's station. Superintendent Koonce is responsible for this innovation. He says banks and business houses find it a good way to establish better relations between their employees and the public. He believes that the men like the plan and show a pride in the representation given them.

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Recent Bus Developments

Buses Authorized in Columbia

The dawn of the new year in Columbia, S. C., will see in operation a fleet of ten 29-passenger White buses of the "pay-as-you-enter" city type, a certificate for operation having been granted the Carolina Transit Company of Columbia, S. C., by Samuel McGowan, chief highway commissioner.

Ten buses will operate over five routes and will provide transportation facilities to sections of Columbia not now served by the street car system of the Columbia Railway, Gas & Electric Company. Suburbs will also be served and one town, New Brookland, across the Congaree River from Columbia. Ten-cent fares will be charged with 5-cent fares for school children and three tickets or tokens will be sold for 25 cents.

The granting of the certificate to operate came after negotiations which had been somewhat protracted. The transportation situation in Columbia has been much in the public eye in recent months, three factors being involved, the 10-cent jitneys, the street cars and the bus lines. The various stages in the controversy have been referred to in these pages.

After holding the application for the permit in abeyance for some time, during which efforts were made to find out what the people of the city wanted, the highway commissioner granted the petition for a certificate to operate. A number of communications were directed to the commissioner, practically all of these favoring the operation of the buses, and so the application was granted. In the meanwhile, the 10-cent jitneys continue their operations, though the City Council at a recent meeting passed an ordinance which gives it power of regulating the jitneys to operate on certain streets, should it deem such action advisable. The jitneys at present run anywhere they like, carry only white passengers and charge 10-cent fares.

Buses in Newton

Buses will take the place of railway cars in the town of Newton, Mass., and in those adjacent towns that are served by the Middlesex & Boston Street Railway. In a recent all-night special session the Newton Board of Aldermen granted the company an exclusive franchise for the operation of buses. Within 60 days the cross-town and Bemis lines of trolleys are to be replaced by buses. The cross-town cars run from Newton to Waltham and the Bemis line runs between Newton and Waltham.

Another line from Lake Street to Newton Highlands, via Newton Center, and to Watertown and Needham, will be motorized by Oct. 26, 1926, or by January, 1927, at the latest. Extra service is to be required of the company as soon as these three lines are provided with buses. The company asked for a subsidy of $10,000 from the town, but this subsidy was refused by the Aldermen. Only two lines of street cars will be left when the new buses are in operation.

Bus Lines in Jamestown to Suspend

Notice that it intends to discontinue bus service on all lines in Jamestown, N. Y., in the near future was served upon the City Council on Dec. 22 by the Jamestown Motor Bus Transportation Company. There was no open session discussion of the proposal to abandon the bus lines by the Council, but that body voted to have a special committee of five men make a general survey of the bus situation, as well as the proposal of the Chautauqua Traction Company to abandon its line between Ashville and Mayville and of the Lake Erie Motor Coach Lines' request for permission to operate buses between Jamestown and Buffalo.

The owners concluded:

1. That even without considering anything for depreciation, the expense of operating the Jamestown Motor Bus Corporation is greater than its revenue. In other words, the buses have not paid the actual cash outlay necessary from day to day to keep them going.

2. That during approximately four years of operation the entire investment of $50,000 in buses has been wiped out by depreciation and the company has been unable to earn any reserve to make the depreciation good.

W. A. Broadhead of the railway said:

> We are faced with this problem, shall we now put into the company enough additional capital (at least $30,000) to purchase six new buses? Not only is there no prospect that we would earn any return on the money so invested, but it appears that the entire investment would be wiped out by the rapid depreciation against which no reserve could be earned.
>
> The deficit incurred in the last sixteen months is $12,738. It would be nothing short of fool-hardy to make a new investment in this kind of business.
>
> The officers of this company are not unappreciative of the importance of this transportation in the development of the city. These conclusions are reached with regret but they are cold facts which face us when the demand for more money for new equipment is made.
>
> At a time in the near future when use of the present equipment becomes impracticable this company will be obliged to discontinue its operations. That date we have not fixed yet but it will not be long deferred.
>
> Pending the fixing of such date we will be glad to have you examine the auditors' statements in detail and give the transportation problem your careful consideration, and we will be glad to furnish you any information which will be of service to you.

Some four years ago the Jamestown Motor Bus Corporation engaged in the operation of a bus service under a franchise from the city of Jamestown. The decision to stop operation is understood to have been based on an examination made by the administrators of the estates of Shelden B. Broadhead and Almet N. Broadhead, who had financed the operation. The Broadheads control both the Jamestown Street Railway and the Chautauqua Traction Company.

Service at Cost Suggested for Washington Buses

F. W. Doolittle, vice-president of the North American Company, which has taken over the routes of the Washington Rapid Transit Company, operating buses in Washington, D. C., wants rates fixed to provide a limited return on a fixed valuation, with the surplus devoted to extending bus facilities. Mr. Doolittle wants the bus properties valued by the Public Utilities Commission and a reasonable return on that valuation allowed in the fixing of fares. The return in the case of other public utilities in the District is 7½ per cent. Over and above this Mr. Doolittle would put the profits into cutting fares and improving service. Mr. Doolittle said:

> The company's Sixteenth Street line is paying well. This should not be taken as an indication of the profitableness of bus operation under existing rates of fare, as adequate service to the community will require transportation routes upon which the same density of business cannot be expected to develop.
>
> It is intended to apply to the commission to prescribe a service-at-cost procedure, by which the returns the company will be permitted to earn will be definitely understood, this plan to provide that excess earnings be utilized for extensions of service or reductions in fares.

Alexander Shapiro of the Milwaukee Electric Railway & Light Company, controlled by the North American Company, has been sent to Washington to study the present bus system.

Oklahoma City Bus Lines Create New Business

The bus lines recently established by the Oklahoma Railway, in Oklahoma City, to supplement street car service are actually creating new business for the company. The North Hudson and Walker bus line established several weeks ago is already making money for the company. A new line, to be known as the Blackwelder line, has been established to run from the terminal and down-town shopping district northwesterly to and beyond the Oklahoma City University. The receipts on this line are encouraging. According to the receivers many automobile owners who have not heretofore patronized the street cars are riding these buses because by so doing they eliminate parking problems and are carried direct to the retail center of the city at less cost.

Bus Company in Napa Formed

Articles of incorporation of the Napa Valley Bus Company, a subsidiary of the San Francisco, Napa & Calistoga Railway, Napa, Cal., were filed recently and the new company has applied to the State Railroad Commission for a permit to operate an auto stage line through the Napa Valley between Vallejo and Calistoga.

It will be necessary for the electric railway to take off some of its trains in the near future owing to a decrease in traffic, it is stated, and it is the intention of the railroad to fill any such vacancies in its schedule with the motor stages. The buses will be used for passenger service only, and the passengers' baggage, which may be checked on their ticket, will follow later on an electric train.

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Bus Service Enlarged.—The New York, New Haven & Hartford Railroad has been given authority by the Public Utilities Department of Massachusetts to operate a bus line between the towns of South Braintree and North Easton, the route passing through Braintree, Randolph, Stoughton, Easton and into North Easton. At the same time the company was authorized to operate buses from North Easton to Canton, passing through Easton, Stoughton and Canton. The town of Needham voted, in town meeting, to instruct its Board of Selectmen to grant the New Haven Railroad a license to run buses through the town on the way from Needham Junction to Newton Highlands, and it is expected that this service will be started immediately.

Buses in Erie.—The Erie Coach Company, a subsidiary of the Erie Railways, Erie, Pa., is operating four 29-passenger Yellow buses over a route of 3 miles at a 10-cent fare. Some time ago A. R. Myers, president of the company, said that he was prepared to operate a bus line from the West Lake Road over the new state highway leading to the Erie Peninsula if the necessity existed for such travel.

Bus Lines to Pay $200.—Under the terms of a new ordinance adopted by the Common Council of Neenah, Wis., effective Jan. 1, 1926, bus lines operating in the city will be required to pay a license fee of $200 instead of $50 for each bus operated as the share of the growing cost of maintenance of streets. Several of the Councilmen favored raising the fee to $500 a year for each bus, but it was felt that in a test case the courts might hold this fee unreasonable.

New P. R. T. Line Started.—The Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has added a new bus route to its city-wide system. The new route, authorized by the Council and approved by the Public Service Commission, was planned to increase transportation facility along the Delaware riverfront. The route will provide transportation along the port of Philadelphia, particularly for workers of the industries located there. The standard single-deck gas-electric buses are being operated. The fare is 10 cents with 3-cent exchanges to all connecting lines.

Bus Line at Cincinnati Bought.—The Cincinnati Street Railway, Cincinnati, Ohio, has bought from Dale McKay the bus line which he has been operating between Mariemont and Oakley. The purchase is subject to approval by the Ohio State Public Utilities Commission, which will hold a hearing at Columbus Jan. 19. At the same time the commission will hear an application of the railway to increase the equipment and service of the bus line from three to nine buses and to extend the line from Oakley to Government Square. The Cincinnati Street Railway proposes to run buses twenty minutes apart from 6 a.m. to midnight. In the event the sale is approved by the commission, it will mark the first transaction of its kind since the railway announced its decision to enter the bus field.

Financial and Corporate

Deficit Piles Up Under City Operation

Thirty-Mile Road on Staten Island Lost $503,768 in Five Years Under Hylan

The Staten Island Midland Railway, operated by the city authorities of New York, piled up for the fiscal year ended June 30, 1925, the largest deficit for any similar period of the five years of municipal operation. The road went behind $103,595, exclusive of any interest or depreciation charges. These figures were derived from the annual and monthly reports of the Department of Plant and Structures made to the Transit Commission.

As the road carried 9,112,421 passengers in the year, the deficit was 1.14 cents per passenger. In other words, the passenger paid a 5-cent fare and the city paid the deficit in the cost of his ride out of taxes.

The Staten Island Midland Road went into receivership, stopped operation and was finally taken over by the city under lease five years ago as an experiment in municipal operation. In no year within this period has the city taken in enough to pay all the expenses.

1.69 Cents Lost per Passenger

If the sum of $50,000, the interest at 5 per cent on the $1,000,000 of first mortgage 5 per cent bonds of the railroad, were included in the results of operation, as they would have to be if the road paid its own way, it would increase the deficit to 1.69 cents per passenger. For the first seven months of operation, 1920-1921, the deficit was at the rate of 0.8 cents per passenger; for the fiscal year 1922, 0.61 cents per passenger; for the fiscal year 1923, 0.39 cents per passenger; for the fiscal year 1924, 0.93 cents per passenger, and including the 1925 deficit, an average of 0.7 cents per passenger over the whole period of municipal operation.

During the period from Dec. 1, 1920, to June 30, 1925, 38,961,517 revenue passengers were carried. The total deficit from operation for this period was reported as $274,602. The addition of the interest of $50,000 annually on the bonds of the company would increase the deficit over the entire period to $503,768, or a deficit over the whole period of 1.29 cents per revenue passenger.

Other items would tend to make the actual deficit even greater. No provision has been made for depreciation during the last three years, either on the equipment purchased by the city or on the property taken over from the Staten Island Midland Railway. Prior to 1923 only $21,530 was set aside for depreciation. In addition, certain rehabilitation work amounting to $163,644 has been charged to capital as recoverable from the receiver of the Staten Island Midland Railway. Ordinarily, part of this amount would be charged against operating expenses and thus further increase the deficit, but in this instance, under the agreement with the railroad, it has been entirely excluded from operating expenses.

The latest report of operations of the Staten Island Midland on file with the Transit Commission is for the month of November, 1925. The deficit for this month is $20,311, compared with $9,407, in November, 1923, and $6,584.24 in November, 1924.

Net Earnings Up in Baltimore

The United Railways & Electric Company, Baltimore, carried 204,341,300 revenue passengers from Jan. 1 to Nov. 30, inclusive. This figure compares with 209,082,005 for the corresponding period of 1924. The number of revenue passengers in November, 1925, was 18,718,923, an increase over November, 1924, when the figure was 18,274,054. The decrease in the total for the eleven-month period is largely due to the extension of fare zones which took place in 1925.

The passenger revenue during the eleven months of 1925 was $14,948,867, an increase of $128,166 over the similar period of 1924. The revenue from this source during the past November was $1,369,348, an increase of $28,951 over the previous November.

Total revenues for the first eleven months were $15,147,802, an increase of $132,502. Total revenues for the past November were $1,387,566, an increase of $31,246.

Net income for the first eleven months was $796,531, an increase of $36,156, or 4.76 per cent, over the similar period of 1924. The net income for November, 1925, was $91,796, an increase of $449 over November, 1924.

Sale Under Foreclosure at Kansas City Set for Jan. 4

Announcement of the postponement of the sale of the property of the Kansas City Railways, Kansas City, Mo., from Dec. 14 to Jan. 4 was made by John T. Harding, special master and commissioner in charge of the sale, after P. C. Groner, William G. Woolfolk, and A. J. Higgins, representing the Newman interests, had requested that additional time be given them because they believed they would be enabled to have the remaining first mortgage bonds and notes deposited with the reorganization committee. Before making the announcement, Mr. Harding made several futile attempts to reach Judge Kimbrough Stone of the federal court, referee, who was in St. Louis at the time.

On the day set originally for the sale, it was said 96 per cent of the first mortgage bonds and notes were on deposit with the reorganization committee headed by the Newman-Woolfolk interests, which are expected to bid in the railway.

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Interborough Deficit Reduced

New York Company Which Transported 1,089,544,225 Passengers Last Year Shows Slight Gain in Net

Gross operating revenue of the Interborough Rapid Transit Company for the fiscal year 1924-1925, made public on Dec. 23, increased $645,215 compared with the fiscal year ended June 30, 1924. Non-operating income, however, was $110,562 less than during the previous year, making the net increase in revenue from all sources for the year $534,653.

OPERATING EXPENSES REDUCED

Total operating expenses, including actual maintenance expenditures in excess of contractual provisions, were $690,936 less than in the preceding year. These gains were offset, however, by increase of $536,060 in taxes and increase of $676,012 in allowances for income deductions. The net result for the year was a deficit of $345,508 after allowance for all expenditures and income deductions. This is $13,517 less than the deficit reported for the previous year.

There was an increase in the number of passengers carried for the fiscal year in question. This figure reached a total of 1,089,544,225 compared with 1,074,343,243 for the preceding year. The increase was 15,200,982—the net result of a subway gain and an elevated loss. On the subject of additional service provided during the year the report showed that 7,542,077 additional car-miles were operated.

Among the improvements to the physical plant was an alteration in the covering of platform columns at Grand Central Station which illustrates how inches count in aiding a freer movement of passengers. The original tile coverings were removed and 2-in. concrete substituted with a net saving of about 4 in. in space around each of the pillars.

In addition to sums spent for current operations of the lines, the company expended about $6,700,000 for new subway cars, additional shop and power facilities, contribution toward construction and equipment under agreement with the city.

A. W. Sperry to Survey Hartford-Springfield Road

Harrison B. Freeman, receiver for the Hartford & Springfield Street Railway, Warehouse Point, Conn., has engaged A. William Sperry, New Haven, to survey the company's property preparatory to an early move on the part of counsel for the bondholders to bring foreclosure action. This move is in line with a suggestion made some time ago by Judge Brown to Francis R. Cooley, chairman of the protective committee. The company has been in the hands of a receiver since October, 1918.

Recent changes in transportation methods have resulted in the development of a service in which twelve trolleys and fourteen buses are used. The company's franchises include territory on both sides of the Connecticut River. Receiver Freeman reports that over the past six months receipts of the company have more than covered costs, due, he believes, to the development of the company's bus business.

Proposal to Change Municipal Accounting at San Francisco

Unsatisfactory methods in accounting, particularly with regard to depreciation reserve funds, have caused a movement before the Supervisors of San Francisco, Cal., to revise procedure with the municipal railway. The present ordinance provides an 18 per cent cut from gross revenue for the depreciation fund, to be used not only for depreciation but accident and damage claims and bond redemption, but expenditures have not been confined to these purposes. At present only about $750,000 remains in the fund after withdrawals for additions and betterments and to cover operating deficits. Additions and improvements projected by supervisors would more than wipe out this $750,000.

Experts maintain that the municipal railway requirements at this time call for a depreciation reserve of $2,900,000. Had the 18 per cent fund been kept intact except for expenditures dictated by the ordinance, the fund would now be about $2,850,000.

The new proposal is to set aside a fund equal to 4 per cent of depreciable assets of the municipal road and equipment, to be determined at the end of the fiscal year, for replacements and reconstruction; yearly surpluses, if any, would be invested for the fund. In addition it is proposed to set up 2 per cent of gross annually for accident and damage claims and to allocate other necessary sums for interest and amortization of bonds. The funds would be started off with $300,000 transferred from the present depreciation fund to the new depreciation fund and $100,000 for accident and damage claims. If the Supervisors adopt the plan, their difficulties in financing improvements to which they are committed will be increased, but the municipal railway accounting will be on a sounder basis.

Loss in Toledo in November

The Community Traction Company, Toledo, Ohio, showed a net loss to its stabilizing fund of $19,952 as a result of operations in November, 1925. Revenue was $286,126, compared with $270,675 for a similar month in 1924, both being on same fare basis. In November 4,003,763 revenue passengers were carried for an average of 133,459 a day with five Sundays and a holiday cutting into the business quite heavily. The total deficit to the stabilizing fund is $258,968 plus the original $400,000 in the fund.

Street Railway Commissioner E. L. Graumlich announced that December and the first four months of the new year would probably show a surplus.

Board members approved the bill for $21,427 submitted by Prof. H. E. Riggs, who conducted the recent transit survey. This amount exceeded the $15,000 estimate made originally as the probable cost of the transit survey.

Taxes of Road in Receivership Remitted

The State Board of Control of Connecticut has voted to remit the taxes of the Danbury & Bethel Street Railway, Danbury, Conn., since the time it went into the hands of a receiver in 1917. The action is conditional, however, upon payment by the company of back taxes due prior to the receivership. These amounted to $22,377. The taxes remitted amount to $41,000.

A. W. Sperry, New Haven, consulting engineer of the company, states the company is in the hands of a receiver because, prior to the receivership, it failed to sell its service to the public. He believes that under proper management the line can be made to pay. One of the principal handicaps under which the company works is the fact that it operates between the two towns over a single-track line. The cost of laying another track now is prohibitive.

Approve Stock Program. — Stockholders of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., approved on Dec. 21 the program recently recommended providing for an increase in the authorized capitalization from $40,000,000 to $80,000,000. The plan contemplates increasing the common stock from $20,000,000 to $40,000,000 and reducing the par value from $100 to $20. It is expected additional preferred will be sold to investors over the counter.

Profit in November.—The Des Moines City Railway, Des Moines, Iowa, showed a profit of $11,954 in November, bringing the deficit of the stabilizing fund to $50,868. November was the second month the 10-cent fare was effective and the second month in which revenues have exceeded expenditures. The number of passengers carried in November was 2,102,982 and passenger revenue $198,114, with operating expenses, depreciation and other charges amounting to $155,869.

Surplus $31,234.—The operating revenue of the Philadelphia Rapid Transit System, Philadelphia, Pa., for the month of November, 1925, was $4,353,335, with operation and taxes of $3,238,853. The surplus for the month was $31,234. The total passenger revenue for the month was $4,294,090. Of that amount $4,157,035 was derived from surface, subway and elevated and $137,055 from buses. The total number of passengers carried was 79,464,368, with 77,991,108, surface, subway and elevated passengers and 1,473,260 bus passengers.

Purchase of Philadelphia Taxis Approved by Council

Purchase of the Yellow Taxi Company by the Philadelphia Rapid Transit Company, Philadelphia, Pa., was authorized on Dec. 29 by the Council transportation committee's approval by a nine to one vote of an ordinance which enables the transit company to increase its capital stock by $5,000,000 and thus finance the buying of taxicabs. The taxicab project in Philadelphia by the P.R.T. has been followed closely in these pages.

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Personal Items

J. M. Bamberger Heads Terminal Company

Julian M. Bamberger, president of the Bamberger Electric Railway, Salt Lake City, Utah, has been elected president and director of the Salt Lake Terminal Company. Other officers named are William Story, Jr., vice-president and director; Henry I. Moore, one of the receivers of the Salt Lake & Utah Railroad (Orem line), secretary-treasurer and director, and Frank Orem, assistant secretary. Other directors elected were A. B. Irvine, U. L. Balser and D. P. Abercrombie.

N. S. Wiltsie, general superintendent of the Bamberger Electric, has been elected general manager of the terminal company.

The reorganization was necessitated by the receivership of the Salt Lake & Utah Railroad. Mr. Bamberger succeeds Chapin A. Day, Ogden, as president. Mr. Day and Mr. Orem are the retiring members of the board of directors. The Salt Lake Terminal Company operates the terminal facilities in Salt Lake City for the Bamberger Electric and Salt Lake & Utah.

C. W. Stocks Heads Bus Association

Carl W. Stocks, editor of *Bus Transportation* and associate editor of ELECTRIC RAILWAY JOURNAL, was elected president of the New York State Motor Transportation Association, formerly known as the Auto Bus Association of New York State, at a meeting held on Dec. 22 in Syracuse. Mr. Stocks was at one time statistician of the American Electric Railway Association. When Albert S. Richey appraised the Knoxville property he became resident engineer in charge of the appraisal. His transportation experience was further augmented with long service in the operating department of the Bay State Street Railway, now the Eastern Massachusetts Street Railway.

C. M. Tew of Columbia Honored

Twenty-five years ago, or in December, 1900, Charles Matthews Tew, then a young man, entered the employ of the Columbia Electric Street Railway, Light & Power Company, Columbia, S. C., as a bookkeeper. A few days ago Mr. Tew was the guest of honor at a luncheon held at the Jefferson Hotel, Columbia, by officials and employees of the Broad River Power Company in celebration of the completion of a service with one concern extending over a quarter of a century.

True it is that the old Columbia Electric Street Railway, Light & Power Company, of which W. B. Smith Whaley was president, passed out of existence in 1911 when the name of the concern was changed to the Columbia Railway, Gas & Electric Company, but through the changes of name and ownership Mr. Tew has held his place, his value as an employee being appreciated by incoming as well as outgoing administrations. At present he is paymaster of the company, now owned by the Barstow interests.

Mr. Tew was at first bookkeeper and later was made treasurer of the company. After E. W. Robertson secured control, Mr. Tew filled the position of auditor and so remained until September, 1924, when the Barstow interests bought the company.

E. J. Burns with Beeler Organization

Edward J. Burns, who resigned as assistant general manager of the San Diego Electric Railway, San Diego, Cal., during the summer of the present year, has become affiliated with the Beeler organization in New York City.

Edward J. Burns

The addition of this persistent and efficient railway worker to the staff of such well known engineers and consultants will undoubtedly work to the mutual advantage of both employer and employee. Mr. Burns' name is indelibly written with that of Mr. Claus Spreckels in the rehabilitation of the San Diego property, following the disturbing war-time days. The results of the combined efforts of these men have been realized to the fullest extent in that city.

Mr. Burns, known as Ed Burns, started his career at the age of 14 as call boy on a steam railroad. He went through the shops and other mechanical departments and then entered electric railway work with the Utah Light & Railroad Company in Salt Lake City. Later he went to the Key Route at Oakland, Cal. Following this work he was employed with the bureau of finance of the California Railroad Commission. Mr. Burns did not confine his activities to electric railway work for he next went with the San Diego & Southeastern Railway, a steam line, as manager, later absorbed by the San Diego & Arizona Railway. It was while he was on this property that he first attracted the notice of the Spreckels interests, which resulted in the Spreckels-Burns combination, whose accomplishments have become well known on the Pacific Coast and elsewhere. In San Diego they not only tried train operation and the weekly pass, but they secured a modification of the franchise exempting the company from paving and other expenses. They built the new La Jolla line to the beach at a cost of $2,000,000 and made San Diego the first street railway on the coast to make use of the motor bus. In addition they increased the good will of the company as well as the actual earnings. When Mr. Burns resigned at San Diego recently it was said there was a possibility of his going to the East, but the decision to settle in New York was not made until a few days ago.

J. B. Eastman became chairman of the Interstate Commerce Commission on Jan. 1 under the rule of rotation by which the position is filled from among the commission members. Mr. Eastman was formerly a member of the Massachusetts Public Service Commission. He was appointed to the federal body by former President Wilson.

John T. Harrington, president of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, was elected president of the Trumbull Steel Company, Youngstown, on Dec. 16 at a reorganization meeting of directors. Philip Wick of Youngstown has been president temporarily following the resignation of Jonathan Warner. Mr. Harrington's election as president of the Trumbull Steel Company in no way affects his connection with the Pennsylvania & Ohio Electric, of which he continues as president.

William Whiteford, assistant to the vice-president of the Twin City Rapid Transit Company, Minneapolis, Minn., has resigned, effective on Dec. 31, to become associated with the International Motor Truck Company at its new Northwest branch in St. Paul. Mr. Whiteford entered the employ of the transit company about twenty years ago as a clerk. Later he became general storekeeper and purchasing agent. Of late he has assisted Vice-President McGill in operation of the lines.

Alexander Shapiro, commercial manager of the Wisconsin Motor Bus Lines, affiliated with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has gone to Washington, D. C., to make a survey of the lines of the Washington Rapid Transit Company, operating buses in Washington, D. C., recently taken over by the North American Company, which controls both the Milwaukee properties and the Washington Railway & Electric Company. Mr. Shapiro is well known in the electric railway field through his long association with the North American Company and the American Electric Railway Association, of which he was statistician. It is understood that for the time being at least he will be acting manager of the bus company in Washington. H. H. England, former

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general manager of the Washington Rapid Transit Company, will act as assistant general manager.

Manfred K. Toeppen has resigned from the position of chief engineer of the Michigan Public Utilities Commission. He has opened offices in Detroit, where he will engage in consulting engineering.

Miss Lois Anderson has been appointed supervisor of service of the Interstate Public Service Company, Indianapolis, Ind., reporting to Harry Reid president. Her duties will include inspection trips on the railway and like visits to local offices. About a year and a half ago Miss Anderson accepted the position of assistant to the director of public relations in the company's office in Indianapolis.

Obituary

M. W. Flanigan

Mortimer William Flanigan, one of the best known electric railway men in western Pennsylvania, died on Dec. 12 from lobar pneumonia. Mr. Flanigan, superintendent of the north side division of the Pittsburgh Railways, was familiar to thousands of north side car riders. Born in Renovo, Pa., on Nov. 25, 1879, he went to Pittsburgh in 1899, relinquishing his office as general manager of the Westmoreland Railways in Derry, Pa., and becoming a division superintendent in Pittsburgh. He was a nephew of the late John Murphy, once general manager at Pittsburgh.

L. H. Griffith

Luther Henry Griffith of Seattle, Wash., one of the organizers of the West Street, Lake Union & Park Transit Company, which consolidated with the Seattle Street Railway and later became the Seattle Electric Railway & Power Company, died suddenly in Seattle on Dec. 14. Mr. Griffith was associated with many of the important industries in the upbuilding of Seattle, including the Green Lake Railway & Power Company, and the plan of connecting Lakes Union and Washington with Puget Sound by a maritime ship canal. He was head of a $1,500,000 enterprise that built the electric line from Seattle to Tacoma in 1891 and promoted the Seattle Railway, opened in 1889. Other notable achievements of Mr. Griffith included the construction of the first electric line in Guatemala, construction of the first electric plant in Blaine, organization of the Seattle National Bank and the Boston & Alaska Transportation Company. Mr. Griffith was born in August, 1861. He completed his education at Cornell College in 1883. He settled in Seattle in 1886.

Allan B. Smythe, superintendent of police of the International Railway, Buffalo, N. Y., is dead. Mr. Smythe was instrumental in bringing about the arrest and conviction of members of the Amalgamated who dynamited the Niagara Falls high-speed line train during the last strike. For several years he was employed by the Philadelphia Rapid Transit Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

"1926 as I See It"

Various Manufacturers Whose Names Are Withheld Express Briefly Their Hopes and Fears for the New Year

Predictions for the future are particularly interesting when given by men of high standing in the industry which they represent. The following statements, gleaned from manufacturers who are closely in touch with the electric railway industry, should prove of value, even though the actual sources of the information are not made known. In each case the manufacturer was asked to state briefly his expectations for 1926, at least so far as his product was affected by the electric railway industry. The lines covered are thought to be sufficiently varied to give some definite impression of economic prospects for the present year.

Manufacturer of Steel Rails.—"The excellent condition which has been prevalent in the steel industry during 1925 will, in all probability, continue at least through the first half of the present year. Unfilled orders continue at a high total, considerable maintenance and extension work on steam and electric roads is in prospect, and the industry as a whole is expected to respond to the general economic stimulus which reached a peak during the past year."

Manufacturer of Trolley Wire.—"We are not looking for an exceptional year in 1926. With the exception of certain proposed electrification projects in steam railroads, little extension work is in prospect at present. Copper will probably not exceed 15 cents per pound—the figure upon which we have calculated our selling budget—for the major portion of the year."

Car Manufacturer.—"Present indications are that car orders through 1926 will not decrease over the past year, at least so far as the electric railways are concerned. Any falling off in orders which may occur, however, will probably not manifest itself until late spring or early summer, as the industry is assured of a certain amount of activity following the publication of annual budget reports."

Bus Manufacturer.—"A year of continued expansion, increased production and new developments in bus design is our forecast for 1926. Many additions to existing operating fleets are contemplated and, in addition, numerous other railways are considering the advisability of supplementing their trolley service with co-ordinated bus operation."

Ticket Manufacturer.—"The year 1926 should prove a fairly good one for our industry. With economic prosperity the number of people riding on various transportation agencies increases. Naturally this stimulates the use of transfers and tickets. It is interesting to note, however, that the demand for theater tickets is inversely proportional to employment, so that this phase of our business is just now subject to a certain slackening off."

Manufacturer of Car Fittings.—"The electric railways are apparently not due to suffer very severely from 'growing pains' during 1926. Few orders have been received from these sources in recent months, and this year will probably not herald many large additions to rolling stock. Steam railroads are showing more activity in this direction. Recent developments have shown that the lull in orders experienced a few months ago was merely a temporary condition."

Record-Breaking Order

Yellow Coach Company Designated to Supply 333 Gas-Electric Buses for Public Service Company

More than $3,000,000 will be spent all in one lump by the Public Service Transportation Company of Newark, N. J. This has been set aside for the purchase of 333 gas-electric 29-passenger motor buses. The new equipment will be obtained from the Yellow Truck & Coach Manufacturing Company of Chicago. It was stated by J. A. Ritchie, president of the Yellow Coach company, that this is the largest single order ever written for automotive units.

Decision to make this material addition to the bus equipment of the transportation company was announced on Dec. 24, but the manufacturer to whom the contract would be given had not been determined at that time. Several days later the transportation officials announced their choice of the Yellow Coach company and stated that delivery of the new equipment would begin in February and would continue at the rate of approximately 100 a month until the order was completed.

Electrical equipment for the new buses will be supplied by the General Electric Company and will be sent directly to the Chicago plant of Yellow Coach, to be there incorporated into the units. The possibility was suggested that some of the bodies might be built in the Plank Road shops of the Public Service company in order to facilitate the placing of the buses in service.

The new equipment, together with Yellow buses now operated by the Transportation company, will constitute a fleet of 411 units of this manufacture. During the past 2½ years the company has expanded its service through the purchase of independent operations and the installation of new routes until its fleet today numbers 800 buses. Many of the miscellaneous and obsolete units have been scrapped, to be replaced with modern equipment,

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and it is expected that the entire fleet will be standardized before long. The New Jersey company is the largest operator of motor buses in the country at the present time.

American Creosote Works Gets Norfolk Plant

American Creosote Works, New Orleans, La., has announced the completion of its plans to purchase the Atlantic Creosoting & Wood Preserving Works at Norfolk, Va. A large water-front property fronting on deep water and adjacent to the Portsmouth Navy Yards has been acquired and it is now proposed to erect a large and modern creosoting plant to take care of expanding Eastern business.

W. H. Wales, formerly president of the Atlantic Creosoting & Wood Preserving Works, will be in charge and the entire personnel of the two companies will be retained. The new plant will be operated under the management of the Savannah Creosoting Company, a connection of the American Creosote Works.

Snapshots of Industry in 1925

In Which Are Portrayed the Outstanding Features of the Manufacturing Year, With Particular Reference to Certain Industries Producing Materials and Supplies for Electric Railway Consumption

GENERALLY stabilized prices throughout a year of moderate purchasing with most of the operating companies holding to the even tenor of their ways but with an occasional large order causing manufacturers to sit up and take notice—that, in brief, was 1925, so far as makers of electric railway equipment were concerned. The trend of prices was, for the most part, gradually downward, although certain materials advanced slightly in response to localized conditions. Little of the general economic stimulus prevalent in industry as a whole made itself felt among producers of equipment and materials whose consumption was limited solely to electric railways.

Leaving this specialized field for a moment, however, and considering the economic condition of the country as a whole, it becomes apparent that the year which has just come to a close was a truly noteworthy one from the standpoint of general industrial prosperity. Business was far more active than at the close of 1924 and although the gains in most lines have not been striking, they have been fairly regular. Agriculturally, the country falls considerably short of being as prosperous as it might be, but other than in the farming districts, production, distribution, employment of labor, clearing of bank checks, and other recognized trade indexes, show an accelerated progress that has brought about an upswing of buying in almost every important industry of the nation.

Despite financial and political uncertainty existing in various other countries, the foreign trade of the United States for the first three-quarters of 1925 exceeded in value that of any full year prior to the war year of 1916. The total trade for 1925 will surpass the trade of any year excepting only 1917, 1918, 1919 and 1920. Considerable electric railway and bus equipment was exported, particularly to the Orient and to South America, although the competition with European manufacturers is becoming an increasingly serious problem.

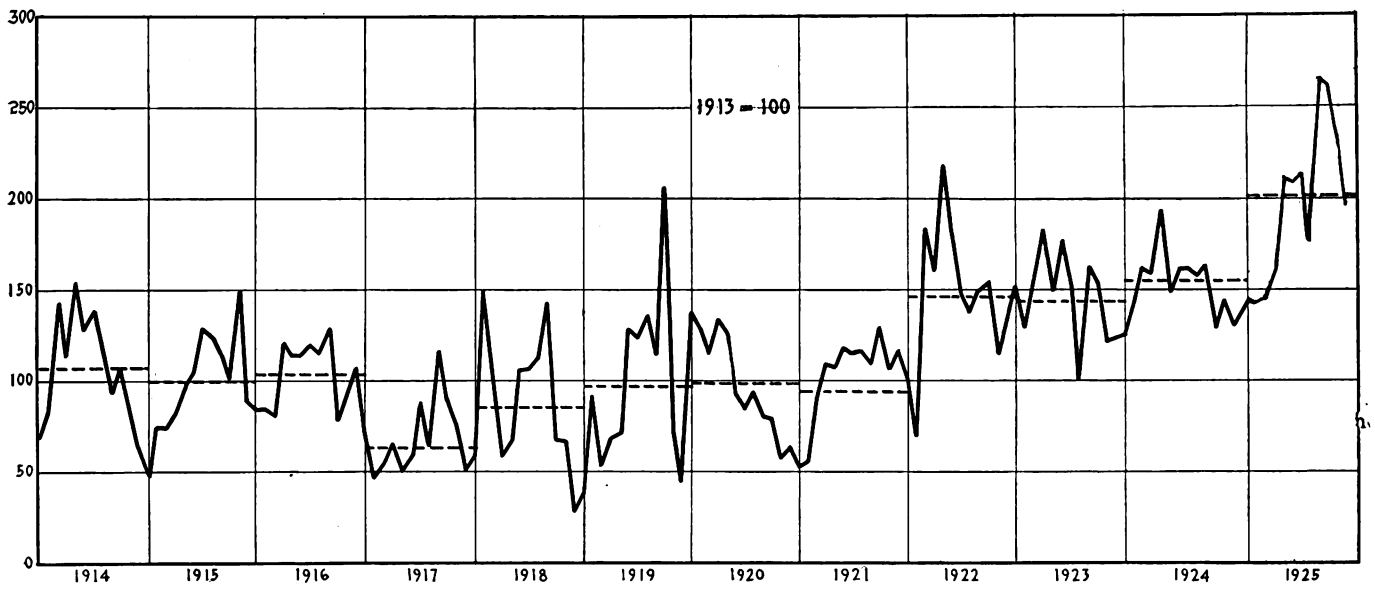
Copper—Even with fluctuating foreign markets, causing a material slump in copper exports, this industry reported a better record in 1925 than was obtained during the year previous. Inasmuch as production in 1924 broke all former records save those made under abnormal war conditions, this achievement takes on added importance. The explanation lies in an assiduous cultivation of the domestic market by the producing companies and in increased efficiency of output and handling.

The manufacture of trolley wire has not touched abnormal heights, however. A keen degree of competition, a policy of watchful waiting and of slow buying among electric railways, and a not too rapid rate of electrification activity on the part of steam roads, have rather held production within well defined bounds.

Cars — A complete review of car manufacturing operations is given elsewhere in this issue. It is not necessary to recapitulate the information here. Suffice to say that but 1,612 cars were purchased by the industry throughout the year, most of the operating companies preferring to "sit tight" and keep outlays for new rolling stock to a minimum.

Steel and Iron—It is here perhaps that the general conditions of prosperity, current in the country throughout 1925, are better exemplified than in any other industry closely affiliated with the electric railway field. After a year of well-sustained and well-balanced activity, the iron and steel producers are in an agreeably strong position. Production of pig iron in the first eleven months of the year reached a total of 33,145,498 tons, as compared with 28,146,600 tons in the corresponding period of the preceding year. Steel ingot output in the same period is estimated at 40,211,069 tons, which compares with 33,241,906 tons in 1924. These totals show gains of 18 per cent in the output of pig iron and 21 per cent in steel ingot production. While prices have remained at a moderate level, reports of the leading companies clearly indicate that the industry as a whole will be able to report a fairly prosperous year.

As reported in the ELECTRIC RAILWAY JOURNAL for Dec. 19, the production of steel rails is one of the most important factors in the iron and steel industry, and it is the total of unreported orders for this material which makes it



General Construction Volume Index Curve Showing Response Made by All Types of Building Activity to Economic Prosperity

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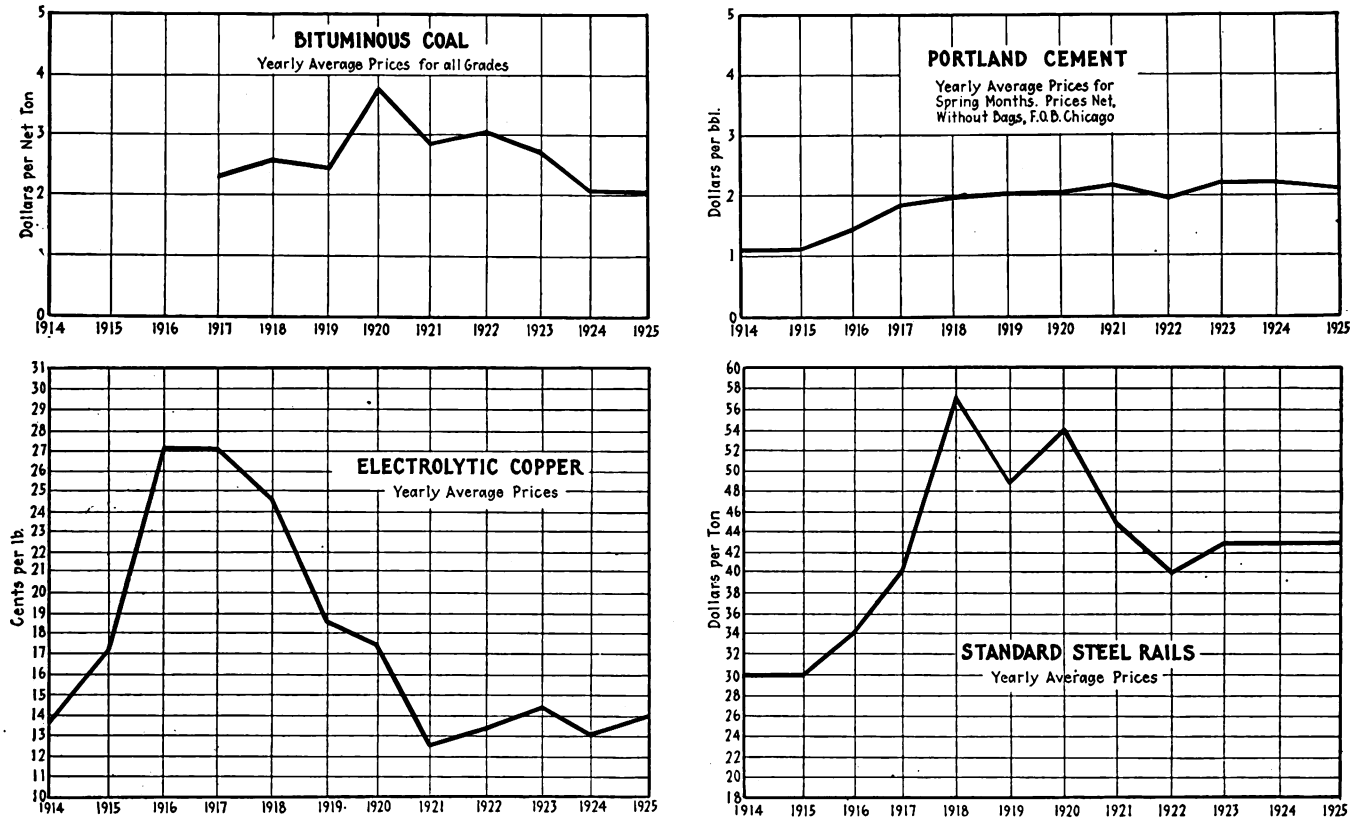

Representative Prices Indicated Over a Period of Years. Note Practical Absence of Fluctuation in 1925

impossible to determine the exact degree to which production during 1925 exceeded all records previously established. The Department of Labor states that practically all mills in steel centers have been operated on satisfactory schedules for the past month.

Electrical Equipment.—Demands for new equipment during 1925 have led prominent manufacturers in this field to believe that conditions are slowly improving in the electric and steam railway fields. Considerable sums have been expended in this direction for maintenance work and for bringing out-of-date and unsatisfactory equipment to a point somewhere approaching modern efficiency.

Particularly noteworthy has been the enthusiasm manifested in oil-electric motive power. Several steam roads have purchased oil electric engines and the New York Central is planning to try out an oil-electric articulated car on some of its branch lines. New developments have also been made in power plant equipment, automatic railway substations, and in general operating equipment.

Buses—A considerable momentum of production has been built up in the automotive field since the depression of last summer, and it is expected that this will tend to keep business active in this industry during at least the first part of 1926. Conditions are in a healthy state of balance at present; employment is large, prices relatively stable, and transportation facilities are ample and efficiently operated. Credit conditions in this field are said to be exceptionally sound and with the careful control of production which is now the rule, the expectation of active spring and early summer business seems to be justified, barring, of course, unforeseen industrial disturbances of an inclusive nature.

A number of important mergers occurred in the bus manufacturing field during 1925, notably that involving the Yellow Coach Manufacturing Company with the General Motors Corporation and that of Graham Brothers with Dodge Brothers. Much attention has been given to the encouragement of coordinated bus and trolley service as a part of operating companies. The increased interest shown in gas-electric bus development has led many companies to add large numbers of these units to their fleets.

Tires—Plans are at present taking shape to break the British monopoly on rubber. The 50 per cent increase in tire prices made during the past year is due almost entirely to the exorbitant rate charged for crude rubber. In fact the price of the crude materials increased nearly 400 per cent over a period of about twelve months, and the retail prices of tires were only held down, partly by increased production efficiency and partly because early in the year tire makers worked on the basis of comparatively cheap rubber, contracted for during the fall of 1924. The rather startling total of $700,000,000 is being taken in annually over and above what the British themselves agree would be a fair price. As long as the monopoly continues little relief can be expected, according to various authorities in the field.

Coal—Considerable stimulus has been given the bituminous coal industry of late due to the "bitter end" aspect of the anthracite strike. In consequence, fairly heavy buying has resulted and the prices of most of the grades have advanced slightly in the past few weeks. Several soft coal mines, previously closed, have been reopened to help meet the increased demands, and a consequent increase in employment has manifested itself in the bituminous region. The average yearly price for all grades during 1925, however, was slightly less than that of the previous year.

General Construction—As illustrated in the accompanying construction volume index curve, the mean of construction for 1925 shows an important rise over that of the years immediately preceding it. This curve may be accepted as a reliable index of construction trend, since it is based on comprehensive reports embracing every type of industrial and commercial construction work.

Safeguard for Magnetic Flagman

Characterized as the most recent contribution to the field of adequate crossing protection, the "Out of Order" signal is prominently featured in a recent catalog issued by the Magnetic Signal Company, Los Angeles, Cal. The manufacturers of the "Magnetic Flagman," which has been adopted as standard on a large number of steam and electric roads throughout the country, have been devoting considerable attention recently to the problem of obviating any dangers which might result from operating failures. That the automatic out-of-order signal meets this need has been satisfactorily demonstrated by the engineers of the company.

The catalog itself is very attractively arranged. Many interesting pictures and diagrams are included to clarify

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the printed descriptions. Detailed specifications of the various types of magnetic flagmen are presented and their most important applications discussed.

Dodge Brothers Increasing Factor in Bus Field with Merger

Dodge Brothers' position and lead in the commercial car field was further strengthened by the recent acquision of a majority interest in Graham Brothers, largest exclusive producers of motor trucks in the country. More than 20 per cent of the combined production now consists of commercial cars, trucks, buses and chassis. Plant additions totaling about $8,000,000 as financed out of surplus are expected to be completed early in 1926, production capacity being increased nearly 50 per cent thereby.

This large increase in production will make possible the reduced scale of prices recently announced by Dodge Brothers. With a month's production still to be reported, sales for last year are already 17,000 cars in excess of sales for the entire year of 1924 and are the largest heretofore in the history of the business, according to official figures issued by the company.

Electrification Recommended as Aid to Farmers

How can the great triumvirate of manufacturers, transportation agencies and farmers work together to further their individual and mutual interests? This important question was discussed in detail at the annual banquet of the Illinois Manufacturers' Association held at the Hotel LaSalle, Chicago, on Dec. 9. Gerard Swope, president of the General Electric Company, spoke for the manufacturers; W. R. Cole, president of the Nashville, Chattanooga & St. Louis Railroad, represented the transportation field; while the agricultural interests were upheld by Eugene D. Funk, Bloomington, president of the American Seed Trade Association.

Mr. Swope advocated a greater development of electric power for the benefit of the three industries. He said that better power development in the United States must be had if the country is to maintain its position of leadership. Adding that the marketing of their products was the greatest problem before farmers, he declared that power development would prove of particular aid to the rural districts. Electrification would give the farmer a larger proportion of the amount for which the goods are sold to the consumer by increasing output and decreasing production expenses.

Mr. Cole, speaking for transportation, declared that, while the railroads were sympathetic with the efforts of the farmers to meet their various pressing needs, the present transportation costs are justly apportioned and are not to be blamed for the depressed condition of agriculture.

Mr. Funk, representing the farmers, voiced the opinion that the future of Middle West farmers is black unless something besides temporary solutions are found for the various agricultural difficulties.

American Car & Foundry Enters Automotive Field

The American Car & Foundry Company has announced the formation of the American Car & Foundry Motors Company, this marking the first important entry by a railroad equipment company into the automotive field. The new company, which was incorporated in Delaware, will own a controlling interest in the Fageol Motors Company of Ohio, manufacturer of buses and trucks, and in the Hall-Scott Motor Company of Oakland, Cal., manufacturer of gasoline engines for motor trucks, airplanes and motor boats. The new company in turn will be controlled by the American Car & Foundry Company.

Colonel Ayres Says What's What

Here is a prediction for 1926 which isn't anonymous. It is by Leonard P. Ayres, vice-president of the Cleveland Trust Company and an economist nationally known. His views appeared in the Cleveland *Plain Dealer*, following a speech made before the Chamber of Commerce on Dec. 15. He annually addresses the chamber on his forecasts for the coming year. It was found, upon checking his statements made a year ago concerning 1925, that they had generally proved correct.

A year of prosperity reaching its highest speed in late summer and then slowing up.

Building construction rising to a new high record in the spring and then starting downward.

Building costs remaining high—proportionately higher for labor than for materials.

Iron and steel produced in even greater volume than in 1925, mainly on account of the demands of railroads.

An automobile production of about 4,000,000.

The bull market on the stock exchange continuing until early next year, when the New York Federal Reserve Bank raises its rate and precipitates a "wave of fear."

Rising wages, rising costs of living, narrowing profit margins, higher wholesale and retail prices and a volume of industrial employment coming to a peak and turning down.

Rolling Stock

Scranton Railway, Scranton, Pa., it is reported, plans to purchase additional one-man cars.

Durham Public Service Company, Durham, N. C., has placed an order with the Reo Motor Car Company for eight buses of 21 passenger capacity.

Metal, Coal and Material Prices

Metals—New York	Dec. 10, 1925
Copper, electrolytic, cents per lb	14.125
Copper wire base, cents per lb	16.00
Lead, cents per lb	9.25
Zinc, cents per lb	8.96
Tin, Straits, cents per lb	63.375
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.00
Somerset mine run, Boston, net tons	2.075
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N. Y., cents per lb	18.25
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., per gal.	0.95
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1550
Turpentine (bbl. lots), N. Y., per gal.	$0.99

Miami Beach Railway, Miami, Fla., recently received twelve new cars. The specifications follow:

Date order was placed	July 24, 1925
Date of delivery	October
Builder of car body	Perley A. Thomas Car Works
Type of car	Light-weight, double-truck, one-man safety
Seating capacity	18
Total weight	36,000 lb.
Bolster centers, length	20 ft. 0 in.
Length over all	45 ft. 9 in.
Width over all	8 ft. 4½ in.
Height, rail to trolley base	10 ft. 11 in.
Body	All steel
Interior trim	Cherry
Headlining	¼-in. Agasote
Roof	Arch
Air brakes	General Electric
Bumpers	Channel
Car signal system	Electric Service Supplies Company
Compressors	General Electric
Control	K-35
Curtain fixtures	Curtain Supply Company
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fenders	Consolidated
Finish	Varnish
Gears and pinions	General Electric
Hand brakes	National Brake Company
Headlights	General Electric
Lightning arresters	General Electric
Motors	Four GE-265, 35 hp.
Registers	International
Sanders	Ohio Brass
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn
Seating material	Wood slat
Slack adjuster	American Brake Company
Step treads	American Abrasive Company
Trolley retrievers	Chas. I. Earll
Trolley base	Ohio Brass, Form 4
Trucks	Brill, 76-E-1
Ventilators	Railway Utility Company
Wheels	Pollak Steel Company 26-in.

Trade Notes

T. D. Owler has been appointed railway sales representative at Chicago, for the Heywood-Wakefield Company, New York. He will take up his new duties after Jan. 1, following the retirement of Edward Buker, his former chief, who is going into business for himself.

Erie Electrical Equipment Company has announced the appointment of the Universal Electric Sales Corporation with offices at 30 Church Street, New York; 11 Beacon Street, Boston, and 332 Healy Building, Atlanta, Ga., to represent it in the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Eastern Pennsylvania, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee and Alabama.

Fageol Company, Kent, Ohio, shipped five new buses to the Jacksonville Traction Company, Jacksonville, Fla., during the first half of December. The railway is under the executive management of Stone & Webster, New York. It will use the new units in its program of bus and trolley service co-ordination.

W. J. Nugent, vice-president and general manager of the Nugent Steel Castings Company, Chicago, has been elected president to succeed Charles Piez. Prentiss Coonley has been elected vice president and C. A. MacDonald, secretary, has been elected to fill a vacancy on the board of directors. Mr. Nugent has been associated with the company since 1918. The interests of Mr. Piez have been taken over by Mr. Nugent and others. The company was organized in 1916.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Baltimore Valuation Case Is of Special Interest

REALIZATION that transportation cannot be sold at a fixed price but that the price must vary from time to time, depending upon the cost of production, has now come to the public. The courts have determined, moreover, that this price must include a fair return on the fair present value of the property, and that present-day reproduction cost cannot be ignored in the determination of present value. It would seem to follow that present value must change from time to time whenever there are important changes in the unit costs of the materials and labor that enter into the construction of the property. In consequence, the question of properly valuing railway properties is one of continuing interest to all transportation executives.

For these reasons, a rather full statement of the way in which the United Railways & Electric Company of Baltimore presented its recent valuation case to the Maryland Public Service Commission is published elsewhere in this issue. The Baltimore property is one of the largest in the country. It had not previously been valued by the commission. Its officers had the opportunity of preparing a valuation case in the light of the multitude of previous decisions in other valuation cases rendered both by commissions and courts, and in the light of the valuable contributions that have been made to the subject by economists and valuation engineers.

Transportation executives and valuation engineers should therefore be interested in the attitude which the company has taken toward such questions, among others, as the significance of original cost, the weight to be attached to present-day reproduction cost, the measurement of going value, and the treatment of depreciation.

In particular, the claim of the company that original cost may serve either one of two purposes and must be defined according to the purpose which it is to serve and the attempt of the company to make an analysis of going value and lay the foundation for a definite measurement of at least its minimum amount open up interesting fields of discussion.

A Valuable Lesson from the Bus Industry

PROBABLY no one will deny that manufacturers of buses, as well as independent bus operators, display remarkable ingenuity and enthusiasm in salesmanship. Seemingly insurmountable difficulties are overcome with apparent ease. No stone is left unturned to put across their product. Why not generate the same ingenuity and enthusiasm both on the part of car and equipment manufacturers and of railway operators?

There has been witnessed a most rapid development of the bus unit from a sort of modified truck to the luxuriously appointed coach of today. The bus manufacturer has bent every effort to interpret the composite public demands, and he has produced a vehicle that appeals to the rider's sense of beauty and refinement.

The auto rider who was satisfied five years ago to ride in a leather-upholstered open touring car today requires a closed mohair-upholstered sedan with all the incidental comforts. He sees in the de luxe bus an appeal to the same desires as the private automobile produces.

It is generally agreed that there is urgent need today for the retirement of large numbers of electric cars of obsolete design. There also exists a demand for an electric car which is substantially lighter than any developed to date, a car which is graceful in exterior lines, has a pleasing interior and one in which the noise of gears and the rattle of brake rigging has been eliminated. Close co-operation between the several car and equipment manufacturers and large railway properties is essential to the successful development of such a vehicle. Radical changes in design of car equipment may be necessary.

Car manufacturers should take the initiative just as have the bus manufacturers and develop the transportation unit desired. A demand exists and it should be met.

Getting the Message Across to the General Public

SKILL in the presentation of electric railway publicity material is of greater importance than the selection of the subject matter. Discussion of this question at a recent convention showed how numerous and varied are the opinions of railway men concerning the most effective type of advertising. Such diversity of opinion makes it rather difficult at times for the individual manager to decide which type would be best in his particular case.

Numerous companies favor good will advertising that has no direct connection with railway operation. Others stress details of their own work, such as shop overhaul methods or provision of snow-fighting equipment. Statistics, particularly cost figures, are a usual type of publicity material. Posters describing points of interest reached by the railway are utilized frequently.

Certain companies employ all of these forms while others believe some of them to be of little value. Good results have been obtained by each of these methods, however, and it appears likely that the secret of success lies largely in the skill displayed in the execution. The public is bombarded with every sort of advertising. It would be impossible for any one person to read all that is offered. The average man reads only such of it as arouses his interest. Few will read dull and uninteresting railway publicity matter simply because they realize that the subject is one of importance.

On the other hand, if the thought is dressed up in an attractive manner people will read regardless of whether the subject concerns details of railway oper-

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ating practice, matters of general community interest or inducements to visit local points of interest. To be really effective, however, publicity material must be honestly written. Bait that has no connection with the story to be told is bad because it makes the reader feel that he has been deceived. If the real subject of the advertising cannot be made interesting, it might better be dropped. When it can be made interesting, however, every effort should be used to make it so. The railway which fails to do this is neglecting a wonderful opportunity.

Storm Clouds Threaten the Province of Ontario

MORE somber than blue is the shade that seems to predominate the railway horizon in the Province of Ontario, Canada, with clouds portending uncertainty and change hovering over the cities of Hamilton, London and St. Thomas. Efforts are being made to bring order out of chaos in Hamilton with the railway continuing service under a temporary agreement, but a transportation deadlock exists in London and the demise of the railway in St. Thomas seems probable. An outline of the facts is essential to the interpretation of these events. In Hamilton the franchise expires in 1927. At the municipal election held on Dec. 7 voters opposed the purchase of the railway by the city, as well as the granting of a 25-year franchise to the company, although they had been warned that something would have to be done if service were to be continued. The defeat came as a great surprise. Now further negotiations are in order and another agreement is likely to go before the voters.

The franchise in London expired not long ago and was automatically renewed for five years, but the city neglected to serve notice of its intent to purchase. The fares fixed by the London by-law are seven and nine tickets for a quarter. With the approval of the Legislature a 5-cent fare was charged for a year or so and the company continued to exact this charge until the Ontario Railway Board ordered the railway on Dec. 12 to revert to the old scale. The company followed with an ultimatum announcing withdrawal. In the emergency an agreement was reached whereby the Council granted the right to charge a 5-cent fare for a period of 60 days. This the company favored, with the proviso that after the first of the year buses and jitneys competing with the railway should be banned. The Council refused this request and the company withdrew its service. In this city, as in Hamilton, the generosity of the railway averted suspension during the holidays.

On the very day on which Hamilton voters vetoed both railway propositions residents of St. Thomas approved the plan to discontinue the railway and award operating rights to a bus company. This line, about 6 miles, will probably cease operating about March 1.

It is to be hoped that there will be a speedy adjustment of affairs and that the agreements in prospect will work to the mutual advantage of the patrons and the companies. Not so long ago another city of Ontario, St. Catharines, began a year under the auspicious occasion of a new franchise protecting the railway from bus competition. Let the new year result in contentment instead of conflict in the entire Province of Ontario. Interesting to outsiders it is that in the discussion in connection with all these cases the voice for municipal ownership is a thin, small one in a province previously noted for its pronounced sentiments of this kind.

The Wonder City of Florida Relies on the Electric Railway

CORAL GABLES, down in Florida, is a high-grade development in every sense of the word. To that end no stone has been left unturned. Here is an ideal community, ideally conceived, ideally planned and being ideally carried out. It has 150 miles of wide, paved streets, plenty of space for parking, excellent conditions for the use of the bus, the taxi and the private auto. But the promoters see a town destined to grow and they realize that growth is dependent on adequate transportation facilities, which are not complete without the electric railway.

Its promoters do not aspire to make a metropolis of Coral Gables. They are content that others shall strive for such honors. They have set out deliberately to make of it a model home community by imposing housing restrictions of the severest kind. As a means to this end of building up an ideal community—and an important means—they have installed an electric railway modern not only in respect to cars, but from track to its very trolley wire. The road makes its appeal to every member of the family. It is intended to be used by every member of the family. The dignity of the most presuming resident of Coral Gables will not suffer a jot in using the road. Not until every member of the family has an automobile will he be a free agent —a degree of the use of the auto that is not only inconceivable but physically impossible.

In the enthusiasm over the magnificence of the type of rolling stock to be used in that city the significance of the installation of the electric railway has not received, even among electric railway men, the attention it deserves. What a tribute that installation is to the essentiality of the trolley in community planning! Looked at rightly, it is one of the most potent arguments in behalf of the industry possible to conceive. Towns and cities elsewhere of modest and even of assuming proportions that are inclined to look down upon the electric railway will do well to ponder the lesson of Coral Gables.

Not every community has the possibilities for future growth that is inherent at Coral Gables; not many communities can hope to approximate it in civic consciousness and in salubrious surroundings. But there is not a community anywhere that can afford to ignore the significance of the value to it that Coral Gables has placed on the electric railway as a means of steady, dependable transportation.

New Cars and Better Service Attract Paying Traffic

A ROAD purchased from a receiver has been made to pay a good return because of the use of modern cars and the introduction of better service. Within a year, the reduction in operating expenses per car-mile was 27.3 per cent, and during the same period the operating expenses fell from 97.4 per cent to 77.7 per cent of the gross revenue. At the same time the average revenue per passenger increased 31.1 per cent, and every month, as compared with the corresponding month of the previous year, showed an increase in gross revenue and a decrease in operating expenses.

This is the record during 1925 of an interurban railway between Buffalo and Erie, which has to meet severe steam railroad competition and is in a region famous for its well-paved highways.

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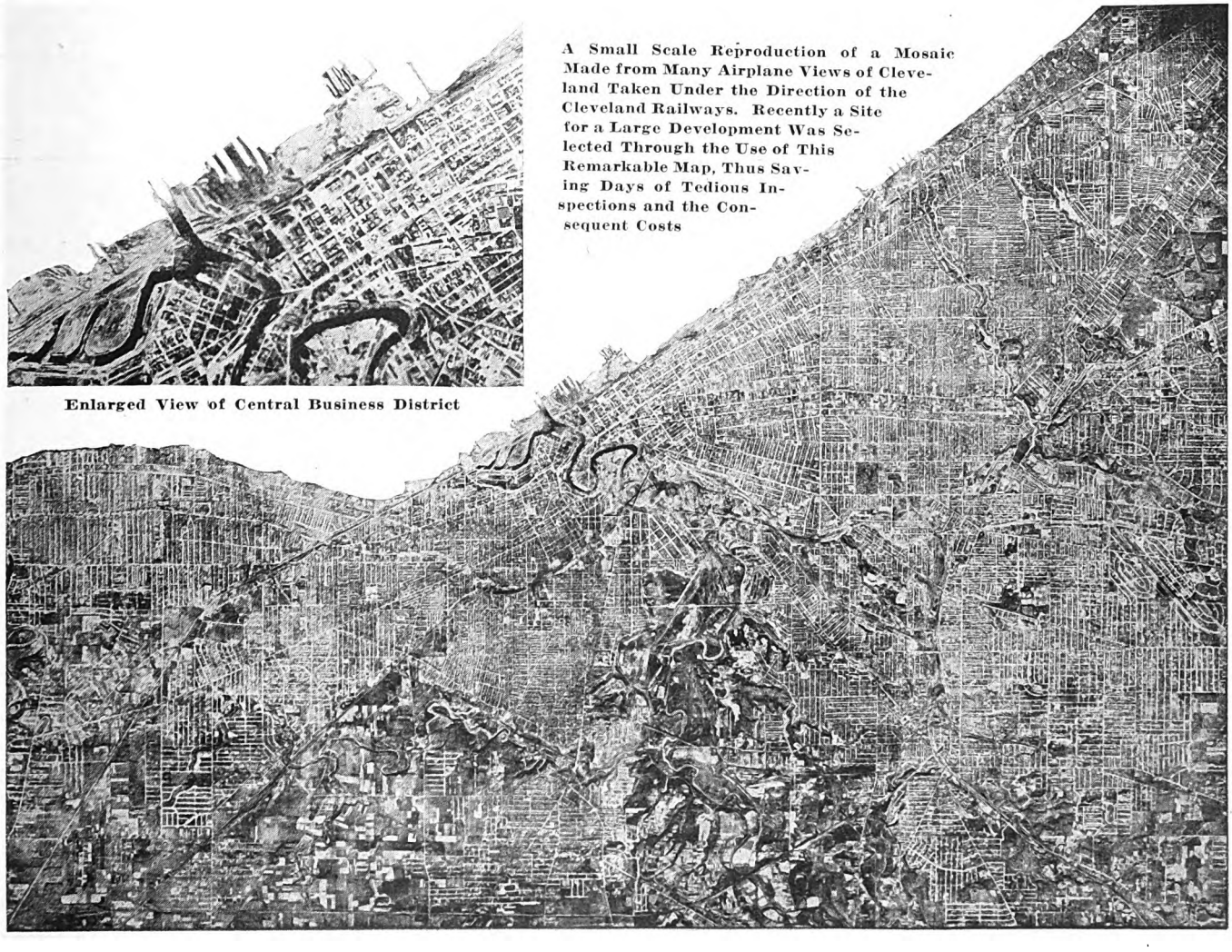
Photography an Aid to the Railways

A Survey Covering 50 Representative Companies Shows Extensive Utilization of Photographs—Claims Department Work, Publicity and Progress Records of Construction Are the Principal Uses—A Majority of the Railways Have Private Photographers —Advantages and Disadvantages of This Practice Are Discussed

PHOTOGRAPHS taken by a group of 50 representative electric railways during the past year range in number from two to 4,000 per company. To record the situation existing at the time of an accident is the purpose for which most of these photographs are used, according to information submitted by the various companies in reply to letters of inquiry from ELECTRIC RAILWAY JOURNAL. Publicity work, safety work, progress records and personnel records are other common uses. A number of railways, however, have developed unusual and interesting applications of photography.

From the comparative numbers of pictures taken by the different companies during the past year it is apparent that some railways have developed the use of photographs to a much greater extent than others. The largest number taken by any company from which information was received was 4,000 by the Cleveland Railway. Next among those replying to the JOURNAL'S inquiry were the Philadelphia Rapid Transit Company, 3,500; the Third Avenue Railway of New York City, 3,000; the Kansas City Railways, 2,682; the United Railways of St. Louis, 1,971; the Market Street Railway of San Francisco, 1,555, and the North Shore Line and the Milwaukee Electric Railway & Light Company, with 1,000 each. Several of the medium-sized and smaller railways use a considerable number of photographs. Among these are the Omaha & Council Bluffs Street Railway, which took some 900 during the past year; the Dallas Railway, 300; the Nashville Power & Light Company, and the Grand Rapids Railway, 200 each; the Middlesex & Boston Street Railway and the Union Street Railway of New Bedford, 100 each.

More than half of the companies replying to the inquiry have photographers in their own employ. Quicker availability of a private photographer is an advantage mentioned by a number of companies. Work done by a company photographer is likely to be less expensive than that of an outside man, it is said. In the case of the smaller railways, however, there is not sufficient photographic work to require a man's



Enlarged View of Central Business District

A Small Scale Reproduction of a Mosaic Made from Many Airplane Views of Cleveland Taken Under the Direction of the Cleveland Railways. Recently a Site for a Large Development Was Selected Through the Use of This Remarkable Map, Thus Saving Days of Tedious Inspections and the Consequent Costs

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full time, and many of these companies prefer to use a public photographer. Others have the work done by one of their regular employees, as do practically all the large companies.

The Mobile Light & Railroad Company states that it finds that its own photographer understands better than does a public photographer just what is wanted in the picture. The publicity director of the New Orleans Public Service, Inc., states that most public photographers either cannot or will not take dramatic pictures and for that reason he does most of the work himself.

Definite advantages in having photographic work done by an outside man are mentioned by several railways. For use as evidence in court in accident cases it is said that the pictures taken by a public photographer are more valuable than those taken by a company man. Thus many railways use both public and private photographers, depending on the purpose for which the pictures are being taken.

Many Pictures Portray Accidents

Claims department work is the most general reason for taking photographs. The statement of the Middlesex & Boston Railway summarizes the general practice. "Pictures taken of the locus of accidents, the street car and the other vehicles which are in the accident have very frequent use and are extremely valuable in many cases. This is especially true of automobile cases, where question arises about the registration. A picture showing the plate has been the deciding factor in several cases. Another common use is to meet a claim by the injured party that he or she is unable to use an arm or leg, bend a knee or work. Patient and persistent activities in the neighborhood of the claimant's home will usually afford an opportunity for a picture in which an arm is raised or a knee is bent or vigorous muscular work is being done. Sometimes where the liability is clear, such a picture has resulted in a defendant's verdict, because the plaintiff is shown to have lied outrageously. Of course, in common with other railways, we find pictures valuable in showing street conditions with respect to holes, worn pavements, claimed bad rail, or snow and ice."

Along somewhat similar lines, the Ottawa Electric Railway states: "We find that photographs showing damage done in accidents, marks on our cars showing where collision has taken place, condition of streets, etc., make excellent exhibits in court in damage cases. We have also found it advisable before breaking into pavement on city streets to lay tracks to have photographs taken of the pavement before it is disturbed. These are valuable afterward as our contract with the city requires that we restore the pavement in as good condition as we found it."

Many electric railways use photographs as a means of keeping records of the progress of construction work. In some cases, the pictures are taken at regular intervals, but more often they are used to illustrate some particular stage of the construction or some special condition existing at a particular time.

Use of photographs in personnel work appears to be increasing. The Duluth Street Railway has for many years had photographs taken of applicants for positions and prints of these are filed with the applications. This is done by a regular man in the employment department who is furnished with photographic apparatus and material by the company. The Kansas City Rail-

SUMMARY OF PHOTOGRAPHIC WORK DONE BY 50 ELECTRIC RAILWAYS

Company	Public Photographer or Regular Employee	Number Photographs Taken Annually	Principal Uses
Androscoggin & Kennebec Railway, Lewiston, Me	Public	....	Accidents.
Binghamton Railway, Binghamton, N. Y	Public	20	Accidents.
Capital Traction Company, Washington, D. C	Public	20	General records, publicity.
Chicago North Shore & Milwaukee Railroad, Highwood, Ill	Both	1,000	General records, construction work, community development.
Cleveland Railway, Cleveland, Ohio	Both	4,000	Accidents.
Cumberland County Power & Light Company, Portland, Me	Public	50	Accidents.
Dallas Railway, Dallas, Texas	Public	300	Construction work, publicity.
Denver Tramway, Denver, Col	Both	50	Accidents, publicity, general records.
Duluth Street Railway, Duluth, Minn	Both	100	Accidents, personnel records.
East St. Louis & Suburban Railway, East St. Louis, Ill	Both	250	Accidents, safety work, general records.
Eastern Massachusetts Street Railway, Boston, Mass	Both	150	Accidents, way and structure inspection records.
Grand Rapids Railway, Grand Rapids, Mich	Public	200	Construction work, amusement parks.
Indiana Service Corporation, Fort Wayne, Ind	Public	100	Accidents, construction work.
Johnstown Traction Company, Johnstown, Pa	Public	....	Publicity
Kansas City Railways, Kansas City, Mo	Employee	2,682	Accidents, safety work, personnel records, publicity
Kentucky Traction & Terminal Company, Lexington, Ky	Public	50	Publicity.
Knoxville Power & Light Company, Knoxville, Tenn	Both	200	Accidents, construction work records.
Macon Railway & Light Company, Macon, Ga	Public	....	Accidents.
Manchester Street Railway, Manchester, N. H	Public	2	Accidents.
Market Street Railway, San Francisco, Cal	Employee	1,555	Accidents, construction work and personnel records.
Massachusetts Northeastern Street Railway, Haverhill, Mass	Public	....	Accidents.
Memphis Street Railway, Memphis, Tenn	Public	....	Various.
Michigan Electric Railway, Jackson, Mich	Public	20	Accidents.
Middlesex & Boston Street Railway, Newtonville, Mass	Employee	100	Accidents.
Mobile Light & Railroad Company, Mobile, Ala	Both	50	Accidents, construction work records.
Nashville Railway & Light Company, Nashville, Tenn	Public	150	Accidents, publicity.
New Orleans Public Service, Inc., New Orleans, La	Employee	700	Construction records, publicity.
Northern Ohio Traction & Light Company, Akron, Ohio	Public	....	Accidents, publicity.
Northern Texas Traction Company, Fort Worth, Texas	Both	250	Accidents, publicity, construction work records.
Omaha & Council Bluffs Street Railway, Omaha, Neb	Employee	900	Accidents, valuation work.
Ottawa Electric Railway, Ottawa, Ont., Canada	Public	....	Accidents, publicity, construction work records.
Pacific Electric Railway, Los Angeles, Cal	Public	220	Publicity.
Philadelphia Rapid Transit Company, Philadelphia, Pa	Employee	3,500	Accidents, publicity.
San Diego Electric Railway, San Diego, Cal	Employee	100	Accidents, construction work records.
Schenectady Railway, Schenectady, N. Y	Employee	50	Accidents, construction work records.
Shreveport Railways, Shreveport, La	Public	....	Accidents, publicity.
Spokane United Railways, Spokane, Wash	Both	90	Accidents, publicity.
Springfield Street Railway, Springfield, Mass	Public	25	Accidents.
The Milwaukee Electric Railway & Light Company, Milwaukee, Wis	Employee	1,000	Accidents, publicity, construction work records.
Third Avenue Railway, New York, N. Y	Both	3,000	Accidents.
Toronto Transportation Commission, Toronto, Ont., Canada	Employee	400	Construction work records.
Twin City Rapid Transit Company, Minneapolis, Minn	Both	300	Accidents.
Union Street Railway, New Bedford, Mass	Public	100	Accidents.
Union Traction Company of Indiana, Anderson, Ind	Employee	75	Accidents, safety work.
United Electric Railways, Providence, R. I	Public	6	Publicity.
United Railways of St. Louis, St. Louis, Mo	Both	1,971	Accidents, publicity.
Virginia Electric & Power Company, Richmond, Va	Public	....	Publicity.
Washington Railway & Electric Company, Washington, D. C	Both	....	Accidents, construction work records.
Winnipeg Electric Company, Winnipeg, Man., Canada	Both	....	Accidents, publicity
Youngstown Municipal Railway, Youngstown, Ohio	Public	....	Accidents, constructionwork records.

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ways and the Market Street Railway of San Francisco are other companies which follow this practice.

Publicity work is another important reason for taking photographs. Two years ago the New Orleans Public Service, Inc., took pictures of its span wire poles throughout the city before removing various unlawful signs, and by picture publicity was successful in preventing the return of this evil. Many pictures are taken by this company for historical purposes, to show development, etc. This railway, however, does not use the photographs themselves in advertising, but to aid the artist in visualizing the subject when he makes line drawings for advertisements.

Recently the Shreveport Railways had a moving picture made for publicity purposes. This showed the unloading of some new cars that had just arrived, their progress through the shop, the machinery, piping, wiring under the cars, then the start of the cars from the carhouse, out onto the lines, the congestion caused by automobiles, and the operation of the cars.

The Virginia Electric & Power Company, while using photographs in various of the usual ways, has also utilized a number of aerial photographs showing proposed rights of way for a transmission line. Aerial pictures have been used also by the Chicago Surface Lines, as told in an article in the ELECTRIC RAILWAY JOURNAL, Aug. 8, page 202. Practices of the Boston Elevated Railway and the United Railways & Electric Company of Baltimore also were described in that article.

Cars Faster than Buses in Test

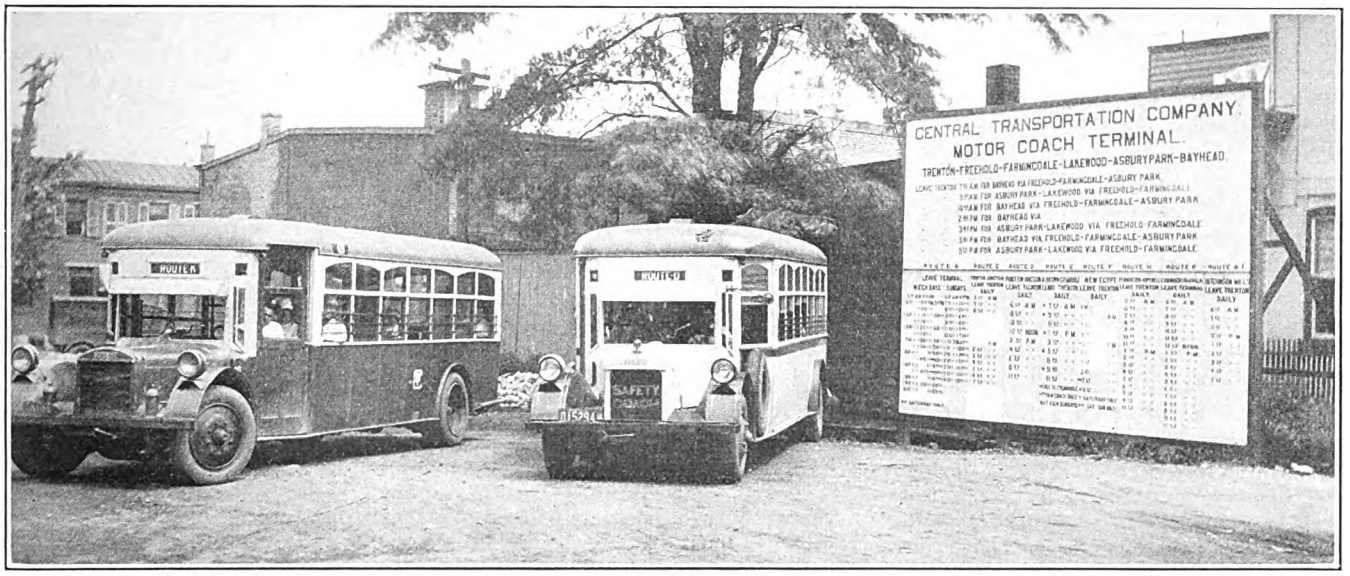
IN ORDER to compare the speed of buses on Fifth Avenue, New York City, and street cars on Third Avenue between Fourteenth and Fifty-seventh streets, checkers of the Third Avenue Railway some time ago carefully timed a number of trips of both vehicles. The distance from Fourteenth to Fifty-seventh Street is 2.1 miles. The average running time of buses was 29 minutes, making the speed 4.3 m.p.h.; average running time of cars was eighteen minutes, making the speed 7 m.p.h. The average number of passengers on the buses at Fourteenth Street and boarding within the area was 54, while on the cars it was 111.

Interurban Bus Lines Operated by City Railway

Trenton & Mercer County Traction Corporation Has Extended Its Service to Points 65 Miles Distant—Traffic Shows Marked Seasonal Fluctuations—All Buses Start from a Central Terminal

UNDER the name of the Central Transportation Company, the Trenton & Mercer County Traction Corporation, Trenton, N. J., has established an extensive system of interurban and city bus lines. Three city routes are operated, serving districts not previously provided with convenient transportation facilities. Outside the city eight bus routes are operated by this company. In character they vary from suburban service on a route 2.5 miles in length to long-distance service to points as far away as 65 miles.

This long-distance interurban service is the most interesting phase of the company's operations. Bus routes connect Trenton, the capital of the state, with the town of Lakewood, a health resort 45 miles distant, and with the seacoast cities between Asbury Park and Bayhead, 60 to 65 miles away. A sufficient amount of all-year traffic exists between the seacoast cities and Trenton to pay bus operating expenses even during the winter months. In summer the volume of traffic is much larger and the route is a distinctly profitable one.



Buses of the Central Transportation Company, a Subsidiary of the Trenton & Mercer County Traction Company, Waiting at the Trenton Terminal

Four trips a day are operated from Trenton through Freehold and Asbury Park to Bayhead. Two other trips are operated from Trenton through Freehold to Lakewood. At Freehold connection is made with a short local line operating on an hourly schedule between that city and Asbury Park. For ordinary service two buses are required between Trenton and Bayhead and one between Trenton and Lakewood. Fageol parlor car coaches are used. Short service between Freehold and Asbury Park is supplied by two additional buses, which are Fageols with street car type bodies. Through fare from Trenton to Bayhead is $2.30. Packages are transported between points on the interurban routes in so far as it can be done without interfering with the convenience of passengers. The rate is only 2 cents per pound with a minimum charge of 25 cents.

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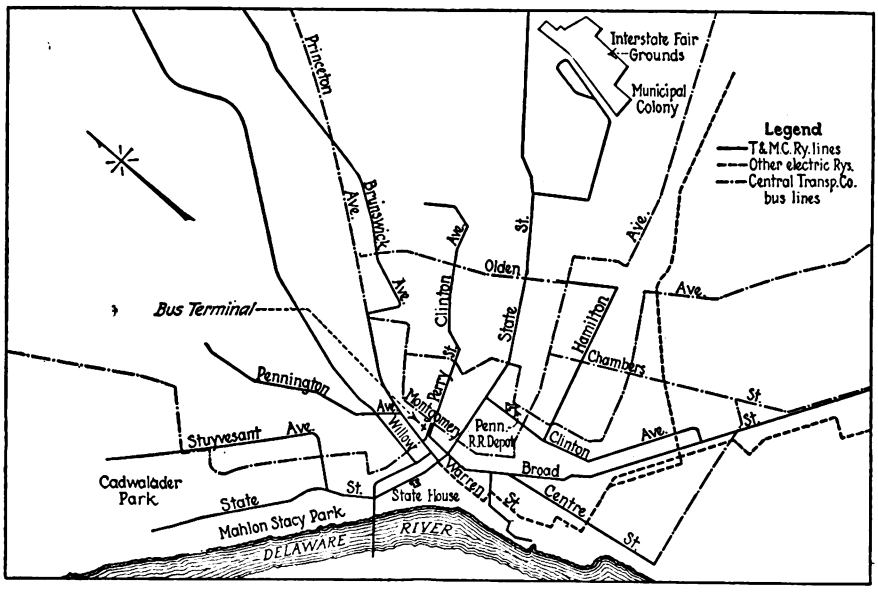


Within the City of Trenton Bus Routes Have Been Arranged so That There Is Little Duplication of Existing Railway Service

Other interurban bus lines are operated by the company to Kingston, Allentown, New Egypt, Hopewell and Chambersburg. On these lines the headways are one hour and two hours. A summary of the headways, number of buses operated, running time and mileage of the various routes is given in the table below. On portions of all the interurban routes the service duplicates that of other bus and railway lines. Where the interurban bus lines of the Central Transportation Company operate on the same streets as the railway lines of the Trenton & Mercer County Traction Corporation the buses do not pick up and discharge local passengers. A similar practice is followed between Asbury Park and Sea Girt, where the buses operate through territory served by the Coast Cities Railway. The relation between these routes and the other car and bus routes of the company is shown on the accompanying maps.

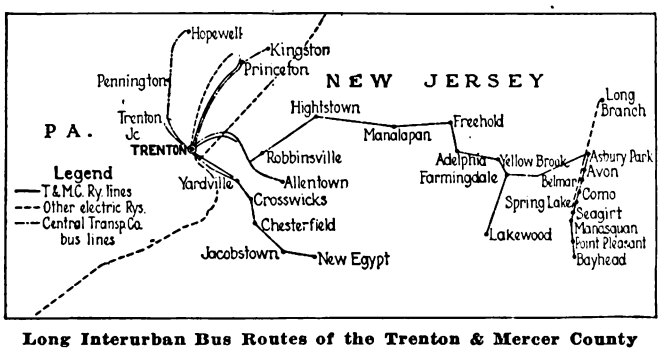
In the majority of cases bus service on these routes was undertaken by the railway to forestall independent operation. Application had been made to operate interurban buses on streets where the railway had tracks. The management felt that it would be undesirable for independents to operate in this way, and for that reason the railway itself undertook to supply the desired bus service. In so doing it has endeavored to arrange its routes with a minimum of duplication.

Of the three city bus lines two serve districts somewhat remote from existing car lines. The third is a crosstown route which intersects a number of other transportation lines, making it possible to travel from one outlying section of the city to another without passing through the congested business district. Headways on the city lines are 30 minutes, with fifteen-minute service on a portion of one route.

All of the interurban lines, except the short line from Asbury Park to Freehold, start from the motor coach terminal of the Central Transportation Company on Perry Street. Two of the three city lines also start from this point. A plot of land has been purchased by the company at this location, which is only a few minutes walk from the center of the city. Temporarily a waiting room has been made from two old street car bodies. It is planned to construct a combined waiting room and terminal in the near future.

In regular service nineteen buses are required. Headways are not shortened during the rush hours and no extra vehicles are required at those times. Three buses are kept in the garage each day for inspection and three are ordinarily used for special trips. Two buses are provided for overhauling, making a total of 27. Occasionally it is necessary to double-head some of the seashore trips. Inspection buses or those reserved for special trips are used. The equipment of the company consists of two Macks, two Six-Wheel buses, five Whites and eighteen Fageols, including four of the parlor-car type.

Route	Destination	Type	Headway	No. Buses	Running Time
A	Empire Rubber Co.	City	30 min.	2	30 min.
A-1	Municipal Colony	City	30 min.	1	15 min.
B	Labor Street	City	30 min.	3	30 min.
C	Trenton Junction	City	1 hr.	1	30 min.
D	Kingston	Interurban	2 hr.	1	1 hr.
E	Allentown	Interurban	2 hr.	1	1 hr.
F	New Egypt	Interurban	2 hr.	1	1 hr.
H	Hopewell	Interurban	1 hr.	2	1 hr.
K	Chambersburg	Interurban	1 hr.	1	30 min.
K-1	Hutchinson's Mills	Interurban	1 hr.	1	30 min.
	Bayhead	Interurban	4 per day	2	3 hr. 15 min.
	Lakewood	Interurban	3 per day	1	2 hr. 5 min.
	Asbury Park-Freehold	Interurban	1 hr.	2	1 hr.



Long Interurban Bus Routes of the Trenton & Mercer County Traction Corporation Connect Trenton and Seacoast Cities

Service Speeded Up by West Virginia Line

THE Monongahela West Penn Public Service Company has been making many improvements in its railway service at Clarksburg, W. Va. A recent statement announces a cut in the running time of its trains between Clarksburg and Weston from an hour and a half to an hour and five minutes.

W. E. Davis, of the company, who announced the change, said the new schedule calls for cars to leave Clarksburg at 5:35 a.m. and every hour thereafter until 11:35 at night. They will leave Weston at 5:10 a.m. and every hour until 11:10 at night. He said:

We have had many requests from our patrons to get them from Clarksburg to Weston and from Weston to Clarksburg a little quicker. To accomplish this we rebuilt portions of our track, equipped the cars for faster operation and installed new passing sidings. All of these things have just been accomplished and we are glad that we are able to offer the new service. I think it will be a very popular mode of travel. We are glad to install the new service, for in doing so we are keeping a promise made to our friends some time ago.

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Valuation Principles in Baltimore Case

An Extended Analysis Is Given of the Methods Used Recently to Obtain for the United Railways & Electric Company of Baltimore Figures for Original Cost, Reproduction Cost of Physical Property, Undistributed Structural Costs, Going Value, Depreciation and Present Value

By W. H. Maltbie
Special Counsel United Railways & Electric Company of Baltimore

MANY points of interest to the electric railway industry were developed in the valuation case of the United Railways & Electric Company of Baltimore, which was presented to the Public Service Commission of Maryland during the past summer.

Since the methods used in the case were quite typical, the processes are here analyzed to indicate the way the value was built up for presentation to the commission.

The United Railways & Electric Company of Baltimore operates the entire system of street railway transportation in Baltimore and in its outlying suburbs, with the exception of one short spur line leading to a local cemetery and the direct interurban lines without local service operated by the Washington, Baltimore & Annapolis Electric Railway between Baltimore and Washington and Baltimore and Annapolis. It has 433.33 miles of track, of which 245.85 is in paved streets, and operates a total of 1,488 cars. In 1924 it operated 35,973,691 car-miles and carried 228,423,774 revenue passengers, with a total operating income of $16,453,-254.31 and gross operating expense of $12,293,999.31. Its total capitalization is $88,134,900, of which $53,673,-700 is bonds, $14,000,000 income bonds and $20,461,200 common stock. These figures cover the securities of the United Railways & Electric Company itself, certain bonds of underlying companies, and such securities of its subsidiaries as are held in the hands of the investing public.

The original street railway system of Baltimore was created in 1859, at which time the city, by ordinance, granted certain rights to the Baltimore City Passenger Railway. In view, however, of some uncertainty as to the city's power to enter into an agreement of the sort then attempted, the Legislature granted a charter to the original company in 1862. Thereafter numerous companies were organized from time to time, until Baltimore, like most other cities of its size, had in the '80s and early '90s a large number of competing horse car or cable companies.

The usual era of consolidation followed and the various companies were absorbed by successive steps, until finally in 1899 the present company was created as a complete consolidation of the then existing lines in and around Baltimore.

Circumstances Leading Up To the Case

Rates of fare had always been fixed in Baltimore by act of the Maryland Legislature, and no change took place from 1900, the year following the consolidation, down to 1918, when the Public Service Commission of Maryland authorized a 6-cent fare.

The Public Service Commission of Maryland, created in 1910, began in 1913 a valuation of the property of the company. The company engaged the firm of Stone & Webster, which in 1914 made a complete valuation of the physical property of the company and submitted it to the commission for its consideration. The engineering forces of the commission checked the inventory, made an independent valuation of the physical property and in 1915 a series of engineering conferences agreed upon figures to be submitted to the commission covering all physical property except land, buildings and street paving.

There was pending at that time an important statewide valuation case of the telephone company, and hearings on the railway case were temporarily postponed. After this and before actual hearings could be started the unsettled financial conditions resulting from the World War intervened, and by mutual consent of the commission and the company the case was carried over without action. This was a natural and simple solution of the problem in view of the fact that there was pending no request for a change of fare either on the part of the commission or on the part of the company.

The rate of fare at this time in Baltimore was 5 cents with universal transfer, with a gross receipts tax, known as the park tax, of 9 per cent on all fares collected on city streets. The United Railways & Electric Company continued to operate on this fare, despite increased costs, until 1918, when it became evident that some action must be taken. The company therefore, acting under the public utility law, filed 30 days notice of an increase in the rate of fare. The commission objected and a rate case was heard in the fall of 1918, which resulted in the increase to 6 cents above noted. This proved insufficient, and later rate cases resulted in successive increases from 6 cents to 6½ cents, to 7 cents, and finally to the present rate of 8 cents, two for 15 cents.

In an early one of these rate cases the commission adopted as a guide in dealing with this particular company the principle that its return over and above operating expenses, depreciation and taxes should be sufficient to maintain the credit of the company, and that this could be accomplished by allowing the company to earn something between 1⅓ and 1½ times its fixed charges (i.e., rentals and bond interest), and subsequent adjustments of the rate structure were made in accordance with this principle.

In the spring of 1924 the company filed a petition asking for an increase of the rate of fare from 7 cents to 8 cents or two for 15 cents, pointing out that under the existing rate schedule it was earning less than the minimum of 1⅓ times its fixed charges and that the increasing costs of operation had wiped out all of the

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economies and modifications that the company had been able to devise in the hope of raising its income above this fixed minimum. At the same time the company pointed out that if the commission was unwilling to continue to operate under the theory outlined above, the company stood ready to complete the valuation of its property as a basis for future rate schedules.

The majority of the commission decided that the company was entitled to the increase in rates for which it asked and passed an order putting these rates in effect, but providing for the completion of the valuation case. The third member of the commission was unwilling to make any change in the rate structure until after the valuation had been completed.

Preparation of the Case

The ten years that had elapsed since 1914, the date of the completion of the Stone & Webster appraisal, had brought such tremendous changes in unit costs, and even in detail methods of construction, that the company felt that the Stone & Webster appraisal was no longer usable and therefore undertook a complete reinventory of its property and a new valuation. The work was carried on during the fall and winter of 1924 and 1925, and the case finally came to trial on May 4, 1925.

The United Railways firmly believes that the yardstick method of appraisal is fully as efficient as the more detailed method and certainly much more economical, and its officers in the American Electric Railway Association have voted for the approval of this particular principle. The company has, however, always recognized that the yardstick appraisal does not lend itself to a case where there is apt to be a legal contest and an effort to enforce the technical rules of evidence, and for that reason, face to face with a case of that sort, it proceeded in the usual form of a detailed inventory and valuation.

The entire work was handled by the engineering and legal staff of the company, although expert witnesses who were familiar with special phases of the work were frequently used from time to time during the proceedings.

The appropriation at the disposal of the Public Service Commission was not adequate for an independent, detailed valuation on the part of the commission staff. The company therefore furnished the commission with its detailed inventory as completed, and this was spot-checked or checked until the commission staff was satisfied that the inventory was accurate. The company also furnished the commission with the unit prices used by it in pricing its inventories and with the total figures for each class of property. These were checked and studied by the commission staff, who prepared in this way their own valuation of the physical property of the company.

This work on behalf of the commission was done by its own engineering forces and by Robert M. Feustel, employed as a consulting expert; all of it, however, under the general supervision of the people's counsel, a direct appointee of the Governor provided for in the Maryland public utility law, whose duty it is to act as opposing attorney to the utilities in all important cases.

The company prepared its case on the theory that no one definite measure of value exists, but that all information which can be helpful to the commission should be placed before it, and that in particular the commission should have information with regard to original cost, par and market value of securities, reproduction cost at current unit prices and evidence as to whether or not present price levels might be regarded as relatively static.

Original Cost

On original cost the company took the position that original cost must serve either one or the other of two purposes. The first of these is to constitute a check on the reasonableness of the present-day claim for reproduction cost. The second is to give some index or evidence as to the amount of the investor's sacrifice or the original dollars devoted to the public service. For the first of these purposes the original cost which is desired is the price paid for the various articles when they were first devoted to public service. For the second the original cost desired is the price paid by the present investor, corporate or individual.

Original cost in the first of these instances, namely, the cost in dollars of the property when first devoted to public service, was for much of the present property of the company impossible of ascertainment. The original company, as indicated above, was created in 1859. Numerous other companies were formed and finally brought by a long train of receiverships, purchases, reorganizations and consolidations into the present single company. The lack of any uniform standard of accounting would have made it extremely difficult to determine original cost even if the books of the constituent companies had been in existence, but as a matter of fact many of these had been destroyed in the great fire which struck the business district of Baltimore in 1904, and the remaining records were fragmentary and incomplete. Everything which the company had was placed at the disposal of the commission staff, but all parties were agreed that a reconstruction of original cost as thus defined was impossible.

On the other hand, original cost in the sense of the amount invested by the present corporate owners was fortunately capable of very definite ascertainment. The final consolidation, which took place in 1899, differed from the usual consolidation in which two or more companies pool their stock and issue to the stockholders of the constituent companies agreed amounts of stock of the new company. There were in Baltimore in 1899 two large and two small systems, the large systems having been built up by consolidations of smaller companies. The two larger systems were not able to get together, and finally parties interested in the smaller systems acquired one of the two larger systems by the outright purchase of all but 374 shares out of a total of 140,000 shares of its outstanding stock, and then secured an option at a flat cash price on a majority of the stock of the second large company on the condition that the option price should be open to every stockholder if he desired to take advantage of it.

It was therefore perfectly possible to get a definite starting point, in cash paid plus underlying bonds assumed, for the property which went into the consolidation in 1899, and since the company's records from that date on were complete there was no difficulty in showing the net additions to capital from 1899 down to the date of the appraisal.

The question of whether the purchase of these stocks at the price paid was a prudent investment was answered, from the company's point of view at least, by the fact that the syndicate formed to take over the stocks thus acquired was very largely oversubscribed, that many of the owners of stocks who had an oppor-

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TABLE SHOWING SUMMARY OF REPRODUCTION COSTS OF PROPERTY OF THE UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE AS OF JAN. 1, 1924

Account Number	Account	Undepreciated — Railways' Reproduction Cost New	Undepreciated — People's Counsel's Reproduction Cost New	Depreciated — Railways' Reproduction Cost New	Depreciated — People's Counsel's Reproduction Cost New
502	Right-of-way—(private right-of-way in county from private parties)	$745,719	$167,576	$745,719	$167,576
503	Other land used electric railway operations.	1,850,662	1,336,380	1,850,662	1,336,380
504	Grading—city and county	2,239,931	1,864,790	2,239,931	1,625,122
505	Ballast	2,093,940	1,781,673	1,758,910	1,692,589
506	Ties	1,537,461	1,310,262	1,291,467	851,670
507	Rails, rail fastenings and joints	4,050,495	3,463,300	3,402,415	2,493,576
508	Special work (including electric switches)	2,993,016	2,553,478	2,514,133	1,717,852
510	Track and roadway labor	4,825,215	3,706,007	4,053,181	2,408,905
511	Paving	3,297,811	2,810,172	2,770,161	2,248,138
512	Roadway machinery and tools	119,842	119,842	83,889	83,889
515	Bridges, trestles and culverts	1,281,419	1,307,327	1,046,474	1,045,862
516	Crossings, fences and signs	97,094	88,983	86,601	77,415
517	Signals and interlocking apparatus	153,583	137,579	150,511	123,821
518	Telephone and telegraph lines	305	289	274	260
519	Poles and fixtures	1,338,820	1,147,253	1,225,020	975,165
520	Underground conduits	219,723	189,464	210,934	179,991
521	Distribution system	3,852,902	3,261,386	3,449,118	2,870,019
523	Shops and carhouses	4,441,435	4,207,565	4,127,027	2,997,029
524	Stations, miscellaneous buildings and structures	340,799	222,552	308,452	174,899
526	Park and resort property	608,574	489,272	551,190	361,867
529	Other expenditures—W. & S.—Trackless trolley construction	45,676	.....	41,108	.....
530	Passenger and combination cars	11,985,622	10,504,354	10,805,789	7,353,048
	Passenger and combination cars trackless trolley buses	23,411	.....	18,729	.....
531	Freight, exp ess and mail cars	52,094	39,322	46,885	19,661
532	Service equipment	454,148	477,729	363,318	262,751
533	Electrical equipment of cars	6,087,930	5,747,935	5,479,137	4,023,554
536	Shop equipment	350,595	350,596	280,476	280,477
537	Furniture	270,720	270,721	216,576	216,577
538	Miscellaneous equipment	153,012	153,012	92,007	99,458
539	Power plant buildings	46,095	43,325	42,868	28,115
540	Substation buildings	478,810	448,061	445,293	363,891
542	Power plant equipment	169,972	169,972	127,479	118,980
543	Substation equipment	1,837,859	1,837,859	1,690,830	1,562,180
544	Transmission system	759,898	642,083	683,908	577,875
	Total	$58,804,588	$50,850,119	$52,181,743	$38,338,592
	Engineering and superintendence	2,940,229	3,305,258	2,940,229	3,305,258
	Administrative and legal expense	1,176,092	.....	1,176,092	.....
	Law expenditures	.....	254,251	.....	254,251
	Taxes	462,229	462,229	462,229	462,229
	Organization prior to construction	1,764,138	.....	1,764,138	.....
	Insurance during construction	62,694	.....	62,694	.....
	Miscellaneous	.....	2,542,506	.....	2,542,506
	Working capital	2,000,000	1,400,000	2,000,000	1,400,000
	Total	$67,209,970	$58,814,363	$60,587,125	$46,302,836
	Interest during construction	7,393,097	4,593,149	7,393,097	4,593,149
	Total	$74,603,067	$63,407,512	$67,980,222	$50,895,985
	Cost of financing	4,476,184	3,170,376	4,476,184	3,170,376
	Total of reproducible property	$79,079,251	$66,577,888	$72,456,406	$54,066,361
	Going value	16,000,000	6,510,789	16,000,000	6,510,789
	Easements—City	17,816,292	.....	17,816,292	.....
	Easements—County	85,204	.....	85,204	.....
	Right-of-way—(Private right-of-way from turnpike companies)	283,458	.....	283,458	.....
	Grand total	$113,264,205	$73,088,677	$106,641,360	$60,577,150

tunity to withdraw the cash chose rather to put the cash back into the syndicate, and, finally, that allotments in the syndicate sold on the Baltimore Stock Exchange at a premium of 14 per cent. The company argued from this that, judged by the standards of the day, the investment must have been regarded as a prudent and wise one.

The company showed in this way a total investment of $69,000,000, exclusive of any allowance to the promoters or any profit to the final syndicate, but including a profit of between 5 per cent and 6 per cent to the purchasers of the first of the large companies.

Reproduction Cost

In order to determine reproduction cost the company engaged competent experts, so far as possible not connected with the company, and for the most part local men familiar with existing conditions in Baltimore and with the particular class of property they were to value. Thus for other land used in railway operations the company secured the services of three of the best known real estate men in Baltimore City, thoroughly familiar with all types of real estate, and asked them to make an independent valuation of the land and file copies with the company and with the commission.

Rights-of-Way.—The company's rights-of-way are of three classes, private holdings in fee simple, perpetual easements acquired by purchase years ago from toll roads, and easements secured by county or municipal grant. The real estate group above mentioned testified as to the cost to reproduce, i.e., to acquire the rights of the first class as of the date of the appraisal. For the second class, and to some extent for the third class, the same group testified only as to the market value of an equivalent area of abutting land, holding that the determination of the value of these rights was a technical question not within their experience.

Buildings—On buildings the company created a committee formed of the heads of three of the largest contracting firms in Baltimore City. Their forces, working with the drawings in the possession of the company, with full access to the structures, and in co-operation with the staff of the commission, prepared a bill of materials for each building owned by the company and then proceeded to estimate a reproduction cost as of Jan. 1, 1924.

Trackage—The determination of the cost of reproducing the track of the company presented a great deal of difficulty. Like most older systems, the company had tried many forms of rail section and various methods of track construction, as well as a large number of different forms of pavement in various parts of the city. These were combined in so many ways that it was impossible to express the total trackage of the company in standard cross-sections. The engineering forces of the company therefore prepared a detailed statement of the type of track installed and the character of pavement, street by street and section by section. The data for each stretch of track were then transferred to a computing sheet and the various quantities of excavation, rail, labor, ties, etc., determined by a force of computers. The summation of these computing sheets gave a grand total of quantities for the system.

The next step was the determination of unit costs. Rail, ties or ballast presented no practical difficulties. The greatest difficulties were found in determining incidental charges, costs of labor and costs of hauling ballast and material and the removal of waste.

For the determination of incidental costs a careful study was made of the previous experience of this and other companies in large track replacement jobs or new construction. For labor costs careful studies were made of the proper organization of track-laying forces and the amount of work to be anticipated from each gang. For hauling costs the probable locations of yards, dumps and quarries were determined and the weighted average length of haul from each of these to the trackage served by it were computed. From these

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figures it was easy to determine a weighted average length of haul for the system for yard material, for ballast and for the removal of excavated waste.

The company was attempting to determine reconstruction cost in the same way that a prudent and careful contractor would make an estimate. For that reason it felt itself compelled to select in every case the most economical method of construction. It therefore estimated all of its track excavation as steam shovel excavation and motor truck haul. It considered carefully the advisability of building from its own rail head and selected building by truck haul as the more practical and in the long run the more economical. For those suburban lines where it had steam road connection it built by steam road methods from its own rail head, leaving till the last step in the process the respiking of one rail, since the gage of the Baltimore system is not the standard gage.

Bridges.—For all of its bridge and trestle work the company secured the services of a local bridge engineer of high standing, not an employee of the company, although he had previously made a study for safety purposes of all of the company's structures of this type.

Rolling Stock.—In view of the fact that a very large portion of the rolling stock of the company had been purchased from time to time from the J. G. Brill Company, the Brill company was employed to prepare a complete reproduction cost estimate of all of the used car bodies and trucks. For this purpose the staff of the commission selected cars which might be regarded as typical of each group or model operated by the company. A complete bill of materials and full detail specifications were prepared for a type car of each group and submitted to the Brill company, which then determined the reproduction cost as of Jan. 1, 1924.

The electrical equipment of all rolling stock and the substation equipment were valued by the Westinghouse company and General Electric Company, each company valuing the equipment of its own manufacture.

Other Items.—The company has only one small power plant, purchasing most of its power from the Consolidated Gas, Electric Light & Power Company of Baltimore. This small plant was valued by a local firm familiar with power plant machinery.

The transmission and distribution systems, office furniture, shop equipment and other corresponding items were valued in detail by members of the company's staff.

Differences with Commission Staff

All of these base values of physical property were checked by the commission staff or by other persons employed by the commission for that purpose. To a very large extent the commission staff after this check accepted the base values claimed by the company.

The exceptions were as follows:

Land.—The valuation of land was made for the commission by a local appraiser connected for many years with the Appeal Tax Court of Baltimore City. He differed as to the value of certain lands and showed a total for private rights-of-way and for other lands below that claimed by the company.

Buildings.—The same assessor of the Appeal Tax Court and a local builder checked the unit costs used by the company for building valuation. They objected to certain unit costs in concrete construction and also to certain incidental costs claimed by the company's appraisers, the total difference amounting to between 9 per cent and 10 per cent on the physical reproduction cost of the structures.

Rolling Stock.—On rolling stock the commission staff secured a lower value by determining so far as possible the price originally paid by the company both for cars and for electrical equipment of cars and applying to this original cost a trend curve based upon the labor and material curve prepared by Brill, a price curve prepared by the Westinghouse and General Electric companies, and other data collected by Mr. Feustel from time to time. The result was a figure considerably below the reproduction cost furnished by Brill for car bodies and by the Westinghouse and General Electric companies for electrical equipment.

On this matter, however, the company pointed out that the Brill curve, which was the main reliance of the commission staff on the matter of car bodies, covered labor and material only and introduced witnesses from the Brill organization who testified that no shop costs, overheads or merchandising costs were included in the curve, and that, if these were added, the index as of Jan. 1, 1924, would be much higher than the one shown by the labor and material curve. The difference more than covered the difference between the commission staff figures and those of the company.

Track and Roadway Labor.—On track and roadway labor the commission staff made a number of changes, some increases and some decreases over the figures presented by the company. The net result of the changes, however, was about equal to the change which the commission staff had made in the item of incidentals and contingencies.

Contractor's Profit.—The company had made its estimates on the assumption that certain important pieces of work, such as the construction of buildings, bridges, trackage, distribution and transmission systems, would be turned over to contractors, and had therefore included an item for contractor's expense and profit. The commission staff accepted the contractor idea so far as buildings and bridges were concerned, but rejected it for all track construction and for the transmission and distribution systems.

The company took the position that the employment of a contractor was in the last analysis an economy, in view of the insurance against additional incidentals, omissions and contingencies and in view of the value of the knowledge which an experienced contractor would furnish as contrasted with a new organization.

In support of its position the company introduced as witnesses A. T. Spencer of Toronto, thoroughly familiar with the reconstruction work carried on in that city, and Jonathan Wolf of the Chicago Surface Lines, thoroughly familiar with the work done there. In both cases the work had been done by the company's own construction forces, and the witnesses testified as to the percentage added to base cost of labor and material to cover actual costs of incidentals, contingencies and various overhead charges. This testimony supported the company's claim that its total cost, including the contractor's expense and profit, was reasonable.

With respect to the employment of a contractor on the transmission and distribution systems the company introduced witnesses who testified that it would be impracticable to build a construction organization sufficiently large to do the work involved in the limited time assumed for reconstruction purposes, and that the most economical way, as well as the only practical way if the work were to be accomplished within a limited

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time period, would be to employ one or more contractors for the job.

Unused or Obsolete Property.—In connection with reproduction cost the company made no claim for property not used or useful. Thus it eliminated certain lands which it still holds but which are not used for railway purposes, a large number of cars which have been retired although not yet scrapped or written off the books and some buildings and power plant machinery not in actual operation.

The company attempted to make its position in these matters entirely clear to the commission, as follows: So long as the commission is considering original cost or investment, any property, once acquired, should remain in the rate base until such time as it has been amortized through payment made by the public in excess of a fair return. If, however, the question is not one of investment but one of present value, then superseded property or property no longer used or useful does not enter into the problem except, in some instances, as an evidence of the cost of developing the business, or, in other words, as evidence of the cost of one of the elements of going value.

Undistributed Structural Costs.—The claim of the company under this head was made up of the following items:

For engineering and superintendence, 5 per cent.
For administrative and legal expense, 2 per cent.
For taxes, actual taxes for one year upon the present property other than income tax.
For organization cost prior to construction, 3 per cent.
For insurance during construction, actual insurance for one year on present property.
For working capital, $2,000,000.

On all physical property plus the undistributed costs above described the company claimed interest during construction of 11 per cent, and on the sum total of the previous items plus interest during construction a cost of financing of 6 per cent. The figure for interest during construction was reached by assuming:

1. A four-year construction period.
2. That the money necessary would be acquired at the beginning of the period at a cost of 7 per cent.
3. That the funds so secured would be deposited or invested in quickly negotiable securities and drawn upon as needed, so that against the 28 per cent of total interest charge there would be a credit of 3 per cent on half the money for all of the time, or a total credit of 6 per cent, making the net interest charge 22 per cent.
4. That half of this would be earned by operations during the construction period.

The result of these assumptions is a net claim of 11 per cent, as stated above.

For these undistributed costs the commission staff recommended the following:

For engineering and superintendence, 6½ per cent, intended, however, to cover the contractor's engineering, while the company's claim covered only its own engineering in addition to that necessary for the contractor.
For legal expenditures, ½ per cent.
For miscellaneous expenses, covering some additional allowances to the contractor, pre-organization expense and administrative expense, 5 per cent.
For taxes the commission staff recommended the allowance of the company's claim.
For interest during construction, 8 per cent.
For cost of financing, 5 per cent.
For working capital, $1,400,000.

GOING VALUE

The existence of going value and the propriety of its inclusion as a rate base was admitted by the commission staff, and it recommended a flat allowance of 10 per cent of the reproduction cost of physical property. The company, on the other hand, attempted to analyze going value and to determine the elements which enter into it and to make some estimate of their value.

The company's position on this matter, which is set forth in considerably more detail in its brief,* may be summarized as follows:

Going value is the sum of those elements which distinguish a concern in successful operation from a new concern fully built and equipped but not yet ready to operate. It is a by-product of operation, beginning to develop as soon as operation commences and increasing as long as the concern grows in experience, increases its knowledge of local conditions and continues to develop its tributary territory.

Various elements enter into going value, but the following may be specially noted:

The development of a trained personnel, not only of the executive staff but of routine workers as well.

The accumulation of valuable records.

The realignment of physical properties, traffic routes and operating personnel.

The supersession of property on account of local peculiarities of the situation.

The ability to maintain a trained staff of experienced workers by utilizing the company itself as a training school.

The development of suburban territory from lean traffic territory into fully populated urban areas.

The cost of producing some of these elements may be very definitely measured. For example, the company knows how much it costs to train motormen and conductors and knows also what it would cost to train them outside of its own operating system. It is also able to estimate with a considerable degree of exactness the actual cost of training other employees, either in the system as an operating whole or by the aid of outside instructors imported to train a new staff and operate the plant during the training period. It is also possible to determine the cost of reproducing many of the valuable records possessed by the company, or the cost of creating them in the first instance. These costs were not presented by the company as the final measure of value but as a minimum value, since it is obvious that a sensible operator could not be persuaded to destroy a record by merely paying him the cost of its reproduction, or to dismiss an experienced employee by merely paying the cost of training his successor.

On the other hand, it is possible to throw light upon the value of records or of experience by estimates of the increased cost of doing business without them. This increased cost per annum, capitalized at a fair rate of return, gives a sum which is undoubtedly greater than the value of the record or the experience, but it indicates, nevertheless, the magnitude and the importance of the element that is under consideration.

The company holds that going value, if existent, is the property of the company without regard to the question of whether the expense of creating it had been paid for as an operating cost. It recognized the fact, however, that in addition to the legal claim to going value the company has a still stronger equitable claim in those cases where the net return from operation during the period when going value was being developed has been less than a fair return. For this reason

*A limited number of copies of this brief are available for distribution to those interested.—W. H. M.

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the company presented a statement showing the shortage of fair return below 6 per cent from the time of the consolidation in 1899 to 1916, and below 8 per cent from 1916 to the date of the valuation. This computation of shortage of income below fair return was not presented as proof of going value, but merely to strengthen the right of the company to claim going value by showing that the actual cost of creating it was borne by the stockholders and not by the public, even although it was charged to operating cost.

Limiting its claim to an amount equal to the shortage of fair return, the company thought it necessary only to establish minimum cost of creating going value rather than the higher figures which might have been shown by a consideration of the savings in operation and the increase in income due to the possession of going value. The company therefore submitted testimony indicating that breaking in a new organization, acquiring local experience, building the necessary records, developing the necessary schedules and meeting such realignment of property and method as might be necessary would cover a period of four or five years, and that the cost (in increased expense and decreased revenue) necessarily involved would amount to about $6,500,000; that the supersessions which would be involved in adjusting a street railway system of this size to local conditions would reasonably be estimated at about $3,000,000, making a total for these items of $9,500,000.

Under the head of the development of traffic the company filed detailed maps showing the condition of the residential area surrounding the city of Baltimore as it stood just before the introduction of cable or electric lines and the same territory as it is today. The contrast was extremely striking and fully explained why these same areas in the period from 1899 to 1911 showed a constantly and steadily increasing traffic and a constantly increasing net return over and above operating expenses, taxes and depreciation. Measuring the stabilized return finally received from the lines serving these suburban areas against the total returns during the development period, the company had a very fair measure of the cost of developing these areas, amounting to $7,000,000.

The total for these four elements is $16,500,000. The shortage in fair return, above referred to, amounted to $16,000,000. The company therefore presented a claim for going value of $16,000,000.

Rights-of-Way

A peculiar situation exists in Maryland with regard to the rights of a street car company in the streets. The original franchises granted in Baltimore City were for a period of fifteen years, renewable automatically for additional periods of fifteen years unless the municipality gave notice of its desire to purchase the property, and the act incorporating the original company provided that in event of such a purchase the city should buy all the property, including the franchises, at a fair value. Many of the franchises for operation on streets now in the city limits were granted originally by Baltimore County before the territory in question was annexed to Baltimore City, and these franchises were, almost without exception, perpetual franchises without any reserved right of repossession. Subsequent franchises granted by the city are of various types, but a very high percentage of the total right-of-way is of one or the other of the above types.

A few years after the consolidation of the various street railway companies into the United Railways a general attempt was made in Baltimore to increase the taxable basis of the city by including the street rights of the various public service corporations. The natural method would have been to place a value upon the franchises, but one peculiarity of the Maryland taxing system is that the personal property of a corporation is not assessed by the local authorities in each municipality or county, but by a state board. The local board could not assess franchises and the state board did not. The local board therefore set up a distinction between a franchise and an easement, claiming that a franchise is the mere intangible right to lay tracks in the street and, as such, admittedly personal property, but that when a company had once laid tracks in the street and started to run cars on them, or laid gas mains in the street and started to supply gas through them, it acquired, in addition to the intangible right known as the franchise, a tangible interest in the land known as an easement.

The matter was carried in three separate cases to the Court of Appeals of Maryland, the court of last resort in the state, and in every case the contention of the local taxing body was upheld. The law is therefore clearly established in Maryland that in addition to its intangible or personal franchise rights a public utility utilizing space in the city streets possesses a definite interest in real estate called an easement, classed by the Court of Appeals as property, as valuable property, and as subject to taxation.

The company therefore claimed a value for its easements based on the facts that they were not originally given to the company, but were in exchange for a valuable consideration; that the original contract provided that they should not be taken except by payment of the value at the time of taking; that their value figured largely in the price paid to the constituent roads at the time of the consolidation; that they had definitely been passed upon by the Court of Appeals of the State of Maryland as an interest in real estate, and that they had been the subject of taxation as real estate.

The valuation of the easements of the company was based upon the same general method as that used by the city of Baltimore in valuing easements for taxation purposes, and the total value for easements and private rights-of-way amounted to between $18,000,000 and $19,000,000.

Depreciation

The company took the position that the investment to be considered as evidence of present value is the total unamortized investment, and that no deduction should be made from it for depreciation unless the inventory of property included property purchased out of a depreciation reserve contributed by the public in excess of a fair return. But in considering reproduction cost as evidence of present value, the actual physical condition of the property may properly be taken into account. For this reason the company presented detailed studies of the per cent condition of its property. The commission staff presented studies of per cent condition on certain schedules, but on others attempted to determine depreciation either by the straight line average life basis or by a combination of average life studies plus inspection. The total allowance for per cent condition shown by the company

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amounted to about $6,500,000; the total depreciation claimed by the commission staff to $12,500,000.

PRESENT VALUE

The company took the following position as to present value:

1. That there is no definite and formal measure of present value.
2. That original cost is not indicative of value unless it has been incurred within a relatively recent period or at least within a period over which there has been relatively small change in unit costs of labor and material.
3. That the par value of securities is not in general an index of present-day value.
4. That the market value of securities, while in some cases it indicates the collective business judgment as to the total value of the property, tangible and intangible, of a corporation, is not such an index at this time when the market value of securities issued in the pre-war period is depressed on account of their low rate of return.
5. That reproduction cost is not necessarily a measure of present value, since a building or a piece of machinery may not be suited for its purpose, may not be properly located, or may not have been maintained in proper condition.
6. That whenever a piece of property is well adapted for its purpose and is serving an essential use (so that if it were non-existent some one else would be compelled practically to duplicate it) its present value differs little, if any, from its reproduction cost less such sum as may be necessary to put it in first-class operating condition.

The sum total of reproduction cost of used and useful property plus easements and going value presented by the company to the commission amounted to $113,000,000. The company offered no direct evidence as to present fair value except the testimony of its president that the present fair value of this property was at least $85,000,000.

The case is in the hands of the commission, which has not yet handed down an opinion. A tabulation of the comparative values found by the Public Service Commission staff and those presented by the company is given on page 71.

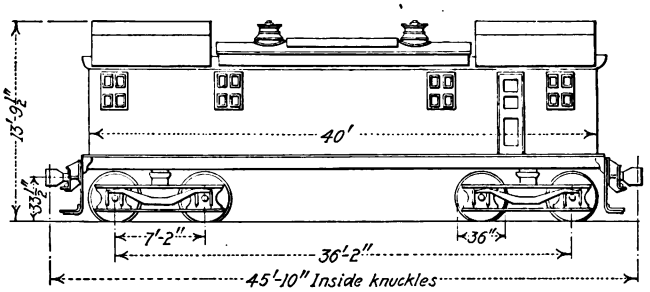
Oil-Electric Locomotive for Long Island Railroad

This Equipment Is Intended to Supplement Electric and Steam Equipment Now in Service and May Be Operated Over Electrified Sections of the Road

FOR switching service in its Bushwick terminal the Long Island Railroad has just purchased a 100-ton oil-electric locomotive. This locomotive has a steel box-type cab with platform carried on two four-wheel swivel trucks. The cab is divided into three compartments, the central compartment containing the power plant and control apparatus, and the two end compartments for the operator.

The oil engine is furnished by the Ingersoll-Rand Company, the mechanical parts by the American Locomotive Company, and the electrical parts by the General Electric Company. Two oil engines are used. These are of the six-cylinder vertical four-cycle type with pistons of 10-in. diameter and 12-in. stroke. Each develops about 300 hp. at 600 r.p.m. Direct-connected to each oil engine is a six-pole, 600 r.p.m., direct-current, compound-wound, commutating-pole generator. A four-pole, 60-volt generator is also mounted on the same shaft as the main generator and serves to excite the field winding. A 32-volt storage battery supplies current for the exciter fields at low speed.

Four direct-current series motors of railway type G.E.-69-C are used for driving. The gearing provides a maximum allowable locomotive speed of 30 m.p.h. The control equipment is entirely automatic. With the differential winding of the generator the output in amperes and volts automatically adjusts itself to meet the requirements of the service and the power delivered by the engine. The only operating handle is the throttle that controls the output of the engine. An electric switch handle determines the connection of the motors in series or in parallel and for forward and reverse movement. No rheostats are used.



Outline of 100-Ton Oil-Electric Locomotive to Be Operated in Switching Service by the Long Island Railroad

After the series parallel switch has been set for either forward or backward movement the throttle handle determines the power delivered by the engine. The generators and motors transmit that power to the driving wheels, automatically adjusting the proportion of tractive effort and speed to the load on the locomotive, and automatically changing these proportions to suit the varying requirements of acceleration or grade.

Auxiliary equipment includes a gasoline-engine-driven air compressor; three high-pressure air storage tanks, to be used for starting the oil engines; a water heater and expansion chamber to prevent the cooling water from freezing when the engines are not operating and for heating the operator's compartment; four fin-type radiators on the roof for cooling water from the engines; exhaust pipes and coolers on each oil engine and water tanks in the cab, into which the water may be drained in the winter when the locomotive is idle. Some of the general dimensions of the locomotive are given in an accompanying table.

GENERAL DIMENSIONS OF THE LONG ISLAND OIL-ELECTRIC LOCOMOTIVE

Length inside knuckles	45 ft. 10 in.
Length over cab	40 ft.
Height over radiator	13 ft. 9½ in.
Width over all	10 ft.
Width of cab	9 ft. 4 in.
Total wheelbase	36 ft. 2 in.
Truck wheelbase	7 ft. 2 in.
Total weight	200,000 lb.
Weight per driving axle	50,000 lb.

Seven tower wagons of the line department of the Los Angeles Railway, Los Angeles, Cal., are being wired in the battery shop of the garage so that the red warning lights will be illuminated with electricity from the truck battery. Previously, red lanterns have been put on the towers at night.

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The Readers' Forum

"Journal's" Analysis of Coffin Prize Presentation Commended

EASTERN MASSACHUSETTS STREET RAILWAY
CHELSEA, MASS., Dec. 1, 1925.

To the Editor:

The JOURNAL is to be congratulated on the excellent manner in which analysis has been made of the briefs of competing electric railways for the 1925 Coffin prize.

Each one of the briefs submitted undoubtedly dealt in detail with a great many important problems, and it is practically impossible for the industry as a whole to study all of the complete briefs. It is therefore refreshing for busy executives to gather from the pages of the JOURNAL knowledge of outstanding accomplishments in each of the six principal subdivisions upon which the award of the Charles A. Coffin Gold Medal was made.

To the mechanical man interest, of course, centers on economies in operation, and methods and practices outlined in such orderly fashion are sure to spur us on to even greater efforts. A single thought frequently serves as the basis for substantial monetary savings when applied to our own particular situation.

To the creators of the Charles A. Coffin Foundation great credit is due. They have inspired electric railway operators to put forth increasingly progressive achievements. The widespread publication of results of individual and combined accomplishments of the several competing companies is of almost equal importance to the industry as a whole. It is largely through this means that the rank and file of the industry can absorb valuable suggestions and promptly proceed to apply such new practices in their efforts better to serve transportation.

W. C. BOLT,
Superintendent Rolling Stock and Shops.

Motorman or Locomotive Engineer

MILWAUKIE, ORE., Jan. 2, 1926

To the Editor:

Interurban electric railways as a rule have sprung from street car systems. In certain respects this has been a handicap. Interurban operators are beginning to realize that it pays nowadays to get away from street railway ideas. In other words, they are copying steam road practices.

This brings up the subject of motormen. What is a motorman? Ask that question of a dozen people and probably every one would answer: a man who operates a street car. The word motorman has been associated with street cars so long that the general public thinks of only such men as operate street cars.

If an interurban electric railway dresses up a man in a blue uniform and a cap with the word "motorman" attached and places him at the controller a kind of stigma seems to hang over the railroad because of the street car idea. Why not throw away those blue uniforms and motorman badges? Allow the motorman to wear overalls and jumpers and place badges on their caps reading "engineer" or "electric locomotive engineer" instead of "motorman." It is not necessary to hire steam locomotive engineers to do this. Interurban motormen today operate equipment that entitles them to the title "engineer." The fact that trains are operated by electricity should not be taken as an excuse to classify engineers as motormen.

Perhaps interurban operators hesitate to allow their motormen to be called engineers because of the wage question. Every motorman in heavy interurban service knows that the responsibility of a locomotive engineer rests upon his shoulders. He is not fooled by placing a motorman's badge on his cap. The Brotherhood of Locomotive Engineers recognizes motormen in heavy service as engineers and accepts them into its organization. The title "motorman" is not recognized. Most electric railroads pay their trainmen all they are financially able to pay, and the name "engineer" could not have any bearing on wages.

On the Pacific Coast there are four interurban electric roads that give the title of "engineer" to their motormen. On three of the roads the motormen wear "engineer" badges. The public never makes the mistake of referring to such roads as street car lines. In fact, they are known as railroads; even the word interurban is more or less conspicuous by its absence.

GEORGE W. BOOTH,
Electric Locomotive Engineer.

Railway Assists in Community Drive in Baltimore

THE United Railways & Electric Company, Baltimore, Md., recently had its conductors and motormen take an active part in a campaign being conducted to raise the Community Fund, a drive held to enable 29 various agencies to carry on their relief and welfare work during the coming year. The company itself gave $6,000 to the fund and the employees gave $7,800. But in addition officials of the company arranged to have the car crews perform an important task. On one day during the campaign more than 1,000 conductors and motormen distributed 100,000 subscription cards to passengers, making it easier for them to give and also bringing the fund forcibly to their attention. The work was done between 9 a.m. and 3:30 p.m. As each passenger passed the conductor one of the subscription cards was presented. In cases where the conductors' work was too heavy for them to give attention to the task the cards were distributed by the motormen as the passengers alighted.

Fire Gong at Railway Clubroom*

FIRE protection is assisted in a novel way in El Paso, Tex. A fire alarm gong, connected to the city fire alarm system, has been installed in the clubroom of the El Paso Electric Railway. Any fire call turned in from any point in the city is thus announced to the dispatcher on duty, who immediately calls the inspector of the division from which the alarm came and tells him the location of the fire. In this way the inspector is able immediately to investigate and call out hose jumpers and other equipment necessary to keep the cars in operation without interruption to service. The installation of this gong has enabled the railway to maintain regular headways and avoid delays in cases of fire.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

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Association News & Discussions

C.E.R.A. Annual Meeting at Indianapolis

ON THURSDAY and Friday, Jan. 28 and 29, the Central Electric Railway Association will hold its annual meeting at the Lincoln Hotel, Indianapolis, Ind. The session will be opened Thursday at 9:30 a.m. by the presidential address of Frank R. Coates, president of the association and president of the American Electric Railway Association.

The following program will be presented after the president's address:

Morning Session

"Electric Railways, Now and in the Future," by Britton I. Budd, president Chicago, North Shore & Milwaukee Railroad.

"Economic Trends of Interurban and Bus Service," by R. H. Pinkley, assistant general manager Milwaukee Electric Railway & Light Company.

Discussion by A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company; R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company; R. R. Smith, vice-president and general manager Chicago, South Bend & Northern Indiana Railway.

Afternoon Session

"Economics of Modern Cars," by Charles Gordon, assistant vice-president McGraw-Hill Company.

Discussion.

"Winning of Public Good Will," by L. J. DeLamarter, president and general manager Grand Rapids Railway.

Discussion.

Report on Work of Master Mechanics' Association, by T. H. Nicholl, president Central Electric Railway Master Mechanics' Association.

Discussion.

Demonstration of Foremen's Conference, by Henry H. Norris, educational adviser Boston Elevated Railway.

Adjournment.

Evening Session

Annual Dinner — Indianapolis Athletic Club—Informal.

Address by Lucius S. Storrs, managing director American Electric Railway Association.

"Some Hoosier Philosophy," by W. W. Herschell.

Friday Morning Session

Report of secretary-treasurer.

Address by Miss Helen E. Steiner, director of public relations Ohio Public Service Company.

Election and installation of officers.

Speakers at New York Association Meeting Announced

WILLIAM F. STANTON, secretary of the New York Electric Railway Association, sends word that the paper on motor bus operation and automobile competition, for which the author was not announced in the program for the convention on Jan. 27 published last week, will be by Ernest A. Murphy, general manager United Traction Company of Albany.

The title of the paper, mentioned in last week's issue, to be presented by a representative of the Cleveland Railway at the convention, is "Economical Practices of the Cleveland Railway." It will be presented by Charles H. Clark, engineer maintenance of way, and will include the exhibit of six reels of moving pictures showing economical practices, particularly in track construction, followed by the company.

It is possible now to give the third speaker at the banquet in the evening. This is Strickland Gillilan, who has a wide reputation for witty after-dinner speaking.

The convention, as already announced, will be held at the Hotel Commodore, New York, on Wednesday, Jan. 27.

Paper on American Transport Situation Published in England

A PAPER by Walter Jackson, Mount Vernon, N. Y., on "Electric and Petrol Transport of Passengers in America" was read before the Institute of Transport, London, England, on Oct. 20, 1925, and recently reprinted from the journal of that society.

American Association News

Cleveland a Possibility for Next Convention

CLEVELAND, Ohio, is under consideration by the committee on location for the next convention of the American Electric Railway Association, which is tentatively scheduled for next October. The city has excellent facilities for the purpose. The auditorium is well known as the place where the Republican national convention was held in 1924. It has two floors available for exhibit purposes, each with about 25,000 sq.ft., or a total space of 50,000 sq.ft. The appointments of the building are excellent. It was designed for exhibitions and is supplied with all facilities, including steam, gas and electricity. The lighting effect of the auditorium is considered one of the finest in this country.

Directly across the street is the armory, which also has about 50,000 sq.ft. It is suitable for the display of heavy machinery and equipment. Together the space available would be about the same as that used last year at Atlantic City.

Hotel accommodations are said to be excellent. Furthermore, Cleveland is within easy reach of the great Middle Western territory, which includes a large proportion of the electric railway and bus operations of the country.

Several members of the committee on location visited Cleveland yesterday in order to inspect the facilities available and determine whether it would meet the needs of the association. These included Chairman C. E. Morgan, Executive Secretary J. W. Welsh, Director of Exhibits F. C. J. Dell, J. H. Alexander, Morris Buck, H. J. Kenfield, J. C. McQuiston, W. C. Parker, A. L. Price, A. M. Robinson, and L. W. Shugg.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 14-15 — **Kentucky Association of Public Utilities, Annual Meeting, Brown Hotel, Louisville, Ky.**

Jan. 20-21 — **Central Electric Traffic Association, Miami Hotel, Dayton, Ohio.**

Jan. 22-23 — **Central Electric Railway Accountants' Association, Miami Hotel, Dayton, Ohio.**

Jan. 26-29 — **Society of Automotive Engineers, Annual Meeting, Detroit, Mich.**

Jan. 27 — **New York Electric Railway Association, Hotel Commodore, New York, N. Y.**

Jan. 28-29 — **Central Electric Railway Association, Lincoln Hotel, Indianapolis, Ind.**

Feb. 11 — **Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.**

Feb. 24-26 — **Electric Railway Association of Equipment Men, Mobile, Ala.**

April 13-16 — **Southwestern Public Service Association, Galveston, Tex.**

Industrial Education as Applied to Rubber Manufacturing*

BY C. S. CHING
Manager of Industrial Relations, United States Rubber Company

THE question of training and educating employees is a mighty interesting one. Especially is this so to me in my present field of activity. It is just as important to us in the manufacturing industry as it is to the public utility. In my present connection with the United States Rubber Company, we have gone through various stages of educational work. We have gone through the stage of exposing people to certain educational courses and hoping that some of it would stick, but it doesn't work. And please don't think that I am criticising or commenting on anything that has been said here tonight, because I think that what we have just heard is a splendid exposition of educational work as applied to public utilities.

I am going to relate some of our own

*Abstract of paper presented at meeting of Metropolitan Section, American Electric Railway Association, held in New York, Dec. 11, 1925.

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experiences. We have gone through a further stage of "bringing up father," in educating foremen not knowing how to go about it. We spent at one time approximately $75,000 in buying educational courses and exposing our foremen to them.

We then went into educational work on our own account, and the greatest success we had in training supervisory forces was in getting the people in a particular plant under the supervision of a man who knew how to prepare and write an article on a specific thing, and then after presentation of a given subject to have a lively discussion.

Please keep in mind that our problem is slightly different from yours, because we operate 53 factories in various parts of the country, some of them having 150 employees and some of them having 5,000. At the present time we maintain regular schools for the training of operators in nearly all factories. The school is apart from any other activity in the factory. The plan of our training is of course to train the operators to do better their particular jobs, but also to give them some instruction pertaining to the policy of the company, its problems and its aims. However, to my mind none of our educational courses is going to be worth anything without our having what Mr. Hass described here a minute ago as the proper relationship between the company and the employee.

We have done considerable recruiting of college men in our industry. We have done a great deal of it in the past and went too far with it. Now it may have been our fault, it may have been the fault of the organization of American industry, it may have been the fault of the man himself, or it may have been the fault of college training; but we did discover, after a while, that you can't have too many racehorses on a farm.

We found that we were getting too many college men into our factories without sufficient opportunity for those men, and believe me, you can have one real nice party when you get about 35 or 40 college men in a plant for about a year and a half and have no place to which to promote them. I don't know what we are going to do with all of the college men in the future or where there are going to be places for all of them in American industry. However, I do know this, that the average college man is not willing to look forward to a foreman's job in a rubber factory. If he does and he is satisfied with that, there is something wrong with him or his education.

We have college men as managers of our technical departments, and central laboratories, as chemists and in our selling departments. However, in the actual process of manufacturing rubber we found that we were overrun with college men and were worried to know what to do with them.

We have, I think, too much of a habit of striking a line and saying that all of the intelligence is above and all of the brawn below. There are a lot of people here tonight who have their present jobs because they were damn lucky, and there are just as good men as I am operating street cars in Boston today at the front end of the car.

Turning to our own operations, it is interesting to note that 94 per cent of our payroll is distributed in piecework. It is evident that a large part of our business is the manufacturing process.

After several lectures at Dartmouth last year, I had a talk with Harry Wellman, who is in charge of vocational training, and I asked what was the trouble with industry or with the university that we can't seem to get together. Mr. Wellman's answer was, "I'll tell you the trouble—the trouble is that you do too damn much coddling." Now there you have the opinion of a man who has been in industry and who is now in a college.

One thing that we are doing that helps our industrial situation is to take the mystery out of business. There wasn't any mystery in it to begin with, but a lot of people thought so. The company takes its operating statements, analyzes them, pares them down to their elements, and explains them in the light of each department's activities. Every workman knows in simplified terms what the company is doing and the relation of his work to the company.

We have a system in one of our plants which is one of the most effective I know of, whereby every day a record of each individual department, together with a complete record of the production of the plant, is put on the blackboard every morning by the foreman, and everybody watches it and notes the percentage of waste. We display everything we possibly can relating to the operation and to the cost of production in dollars and cents. In one department the mere posting of the amount of waste of one expensive material resulted in a marked decrease in this waste the following week.

Now I believe our big task is to try to convince our own people of the problem at hand. It is becoming more and more a problem for American industry how to best utilize the man from the neck up and not the rest of him. If we are going to get anywhere in our industries that is what we have to do. We must make the machine and power accomplish our manufacturing, and manpower should be used to build the machine and to guide its work.

Promotional Work as Practiced by the Brooklyn Edison Company*

R. V. RICKCORD
Manager Personnel Service Department, Brooklyn Edison Company

MOST of us who have been in contact with public utilities for any length of time, and certainly with men like Matthew F. Sloan, Henry L. Doherty and Mr. Menden and a few other big men, cannot be in their presence very long without feeling that terrific driving spirit of service. Only by close contact with these men is the realization driven home that the giving of high-grade service is a serious problem and requires tremendous effort all the time to accomplish results.

An important aid in the development of employees capable of furnishing the high standard of service required by these leaders is the diversified educational work practiced by many companies.

In the promotional and educational work conducted among our employees the clerical and sales employees are enabled to take the commercial courses and the technical employees the technical subjects, and the trade employees have available certain technical classes in addition to the training offered to develop skill in the trade itself. For instance, we have a school for linemen, another for cable splicers and still another for meter testers. For supervisors of various departments we have a complete course of conferences. In order to train new employees we have a course for cadet engineers in which we give specific, properly supervised work in the several departments of the company and a certain amount of specific research work accompanied by periodic lectures on the latest developments in the company.

To augument the work of the technical employees and the cadet engineers, the company has constructed and has maintained extensive laboratories equipped with different kinds of machines in which series of tests are made in many ways similar to the electrical laboratories maintained in the universities. An attempt is always made to emphasize the practical application of the technical subjects as they affect the specific work of our company.

[Note—The paper was well illustrated by a number of slides showing the organization of the educational work, the class rooms and laboratories. —EDITOR.]

*Abstract of paper presented at meeting of Metropolitan Section, American Electric Railway Association, held in New York, Dec. 11, 1925.

Special Reports Available

FOLLOWING is a list of special reports that have been prepared by the bureau of information and service of the American Electric Railway Association. These reports are available to member companies upon request:

Bulletin No. 59. Wages of Employees Other Than the Trainmen. Gives for about 225 companies a classification of employees and the wages paid each class in the shop, barn, way and structures, power, overhead line and storage departments. Also shows the number of hours worked weekly, the average weekly wages earned, overtime rates, and number of employees in each department.

Bulletin No. 60. Electric Railway Financing in 1925. A list of new securities issued in 1925 showing the type of securities, the amount issued, the surety date, interest rate and offering price. The bulletin also contains a summary of securities defaulted, retired or refunded during the year, the securities of companies abandoned, and a statement of the net change of electric railway capitalization during the year.

Bulletin No. 61. Trend of Material Prices. A new edition of the association's compilation bringing down to date the trend of prices of materials used by electric railways as furnished by the manufacturers of those materials.

Bulletin No. 62. Electric Railway Fares in Cities Over 25,000 Population. Gives a brief record of recent fare history in each of the American cities of 25,000 population or more, arranged alphabetically. It is preceded by a summary showing the number of these cities operating at each rate of fare during the years 1917 to 1925 inclusive, with a chart showing the distribution and trend of fares during the same period.

In addition to the above, supplements to the Fare Bulletin, Wage Bulletin, Bus Wage Bulletin and Cost of Living Studies (Bulletin No. 63) have been prepared bringing them down to date.

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Maintenance of Equipment

Filling Cracks in Concrete Pavement*

DEVELOPMENT of cracks and the subsequent frost action from moisture getting into the cracks and breaking up the surface of the pavement is the major trouble experienced by the Denver Tramway, Denver, Col., in connection with concrete pavement. This class of trouble has been entirely eliminated by use of a special method of filling in the cracks. Compressed air with a nozzle pressure of 80-lb. per square inch is used for cleaning out the cracks, and the surface is then painted with a special concrete primer paint of a highly penetrating nature. The paint consists of a solution of asphalt and a light petroleum oil. This primer coat dries rapidly and as soon as it is dry a hot asphalt of a special nature is poured into the cracks.

Prior to adopting this practice two difficulties had been encountered in the maintenance of concrete paving. The first of these was that it was found almost impossible to make any asphaltic material that was poured into the cracks hot adhere to the concrete for any length of time. This difficulty was solved by the application of the primer paint, which bonds the tar or asphalt. The second difficulty was from the slight movement which takes place in the concrete during the winter months. This broke the asphaltic material filler. This latter difficulty was solved by the use of the material known as soft Allenite, which retains its plasticity during extremely low temperatures.

Two men operate the equipment for doing this work. The equipment consists of a Ford 1-ton truck with body, an air compressor and a tar kettle. These are all linked up so as to move as a unit.

Such supplies as paint, Allenite, kindling wood, red flags, and other tools are carried on the 1-ton Ford truck. The air compressor is electric-driven, taking current from the trolley wire. Hose 150 ft. long with a special ¼-in. nozzle is used to blow dirt out of the cracks. A pyrothermometer is used to determine when the Allenite is heated to proper temperature.

The same equipment is used also on reconstruction work that is to be paved, in order to waterproof the construction joints on each side of the track between the company's paving and that placed by contractors for the city. The maintenance of joints between the city's dummy strip and the car track concrete has been reduced materially by the insertion of asphaltic joint filler, which keeps the concrete surface from becoming abraded as cars pass over the track.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

Night Inspection of Trolley Wire*

SEVERAL years ago the Northern Texas Traction Company was having many trolley wire breaks on its city lines. In 1921 there were 313 breaks, or an average of approximately one break per day. At times there have been as many as twelve trolley wire breaks in a single day. In an attempt to decrease such interruptions to service a system was devised whereby a line crew would be available at night for inspection duty. Prior to the inauguration of this inspection schedule the night crew did nothing but stand by in case of trouble. This crew consisted of one truck driver and one lineman, together with a 1-ton Ford tower truck.

For the night inspection work a spotlight was placed on top of the tower. The lineman on this inspection truck stayed up on the tower while the truck was driven slowly under the overhead so that the lineman could inspect the hangers, ears, sleeves, frogs and trolley wire. Parts

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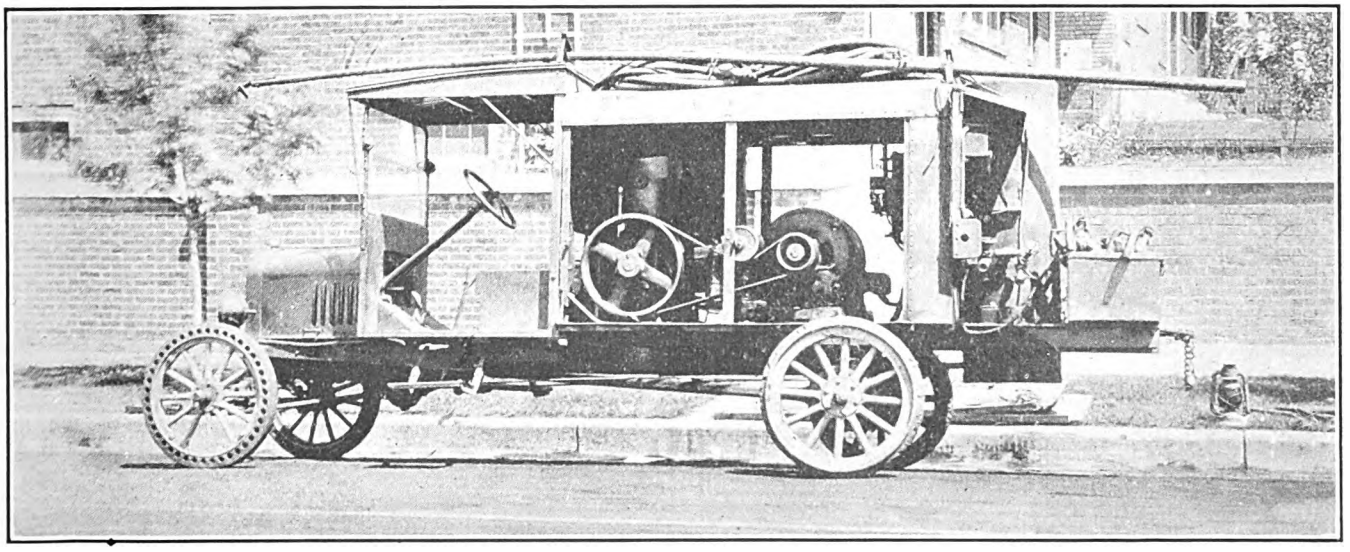

Electric-Driven Air Compressor Mounted on Ford Truck

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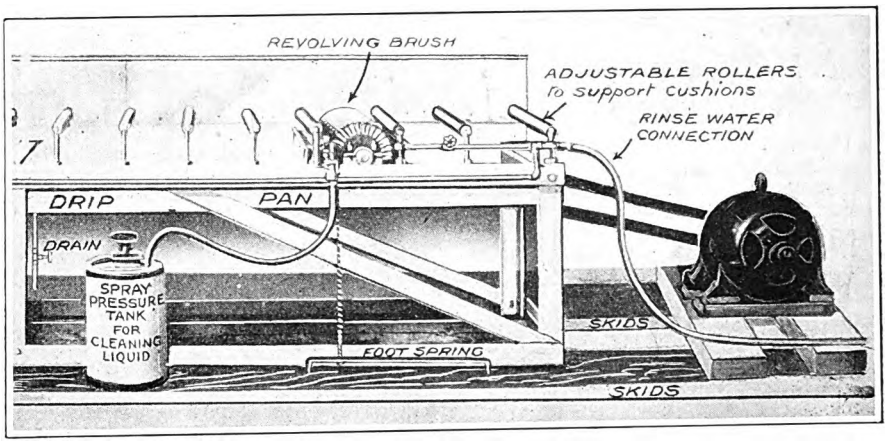
reported by the night crew were repaired by the day line crew.

After this night inspection was undertaken it was found possible for the crew to go over the line at least once a week. It was left to this crew to see that flaws in the overhead were reported before a break occurred, and if a break occurred soon after an inspection had been made it reflected on the efficiency of the night crew. As a result of this work the total trolley breaks on the entire system of overhead construction have steadily decreased from 313 breaks in 1921 to six breaks for the first six months of 1925.



Single Brush Cleaner Used by Richmond Light & Railroad to Clean Cane Seats When Cars Are Overhauled

Rolling Scaffolds Used for Building Maintenance

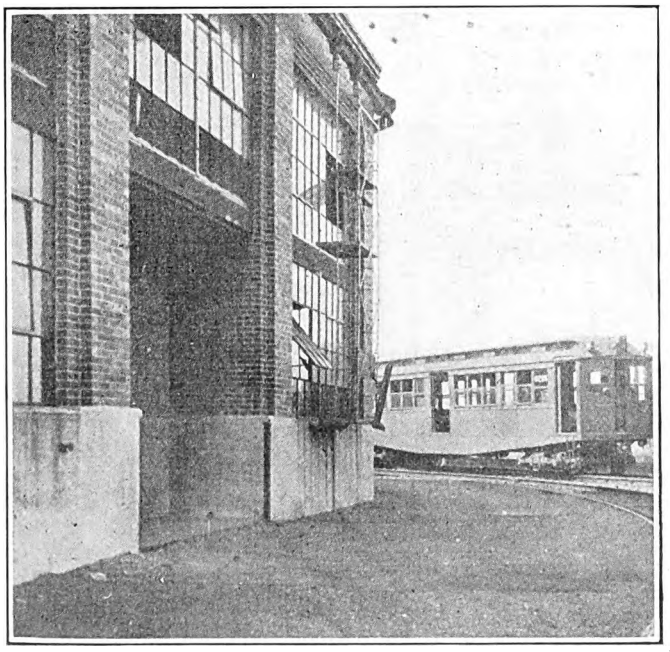
ONE of the distinctive features embodied in the design of the recently completed Everett shops of the Boston Elevated Railway is the large amount of window space. The walls of the buildings consist chiefly of brick columns with large window areas between. Along the entire length of the roof of each building is a skylight. These large glazed areas have created a problem in building maintenance because much of the sash and glass is not readily accessible for painting and repair. To solve this problem rolling scaffolds of the type shown in accompanying illustrations have been provided. These scaffolds are simple iron frameworks supported on wheels which follow a track running around three sides of the building. Because the fourth side opens onto the transfer table runway and is provided with doors for all tracks it has small window space and the scaffolds are not used there. A somewhat similar scaffold has been arranged for each skylight. It is expected that the time required for repainting sash and repairing glass will be much reduced as a result of the installation of these scaffolds.

Machine for Cleaning Cane Seats

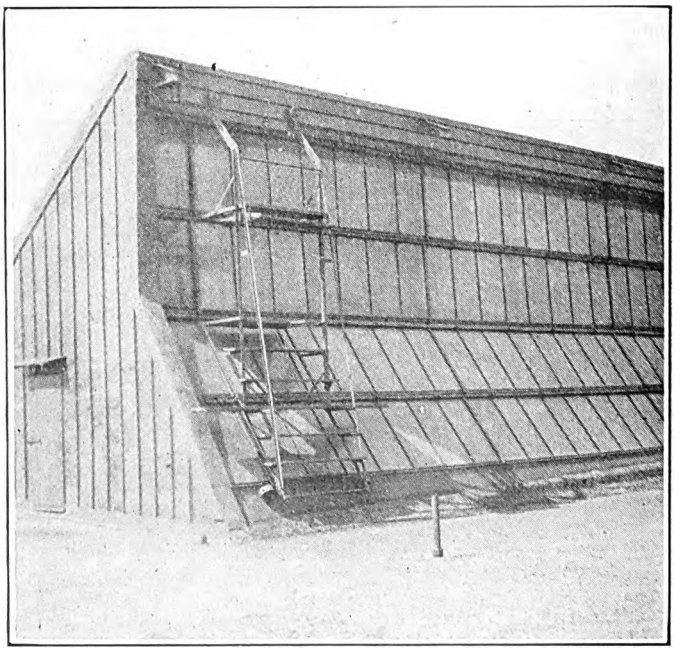
DURING periods of overhauling it is very desirable to clean the surface of cane seats and backs. The Richmond Light & Railroad Company, New York, N. Y., has recently installed a machine manufactured by the Wilson-Imperial Company of Newark, N. J., which is illustrated in the accompanying view. The cane seats and backs when removed are moved back and forth on the table consisting of a series of rollers and the wire brush, which is revolved by the motor and cleans the seats with the aid of the special cleaner supplied by the manufacturing company.

The cleaner is placed in a tank under pressure and is applied across the surface of the brush from the pressure tank by means of the pedal. When the seat has been cleaned, the dirt and surplus cleaner is flushed off by turning on the rinsing water connection. The excess material falls in the tray below and is drained away.

While this material can be used by means of a hand brush the capacity of the machine process is much larger, since one man can clean the seats of several cars in the course of a day.



Scaffold Suspended from Rollers on Overhead Track Is Useful in Building Maintenance



Skylight Scaffold Used at Everett Shops of Boston Elevated Railway

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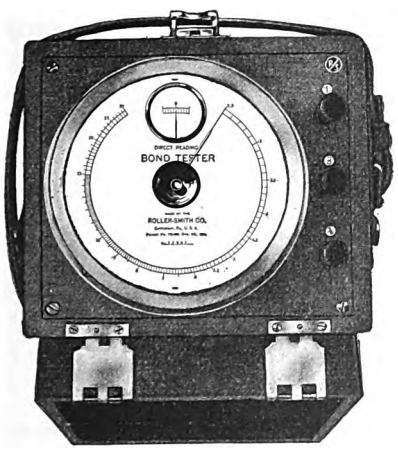
New Equipment Available

Extremely Sensitive Bond Tester Produced

SEVERAL outstanding features have been incorporated in a new bond tester just announced by the Roller-Smith Company, New York, N. Y. The new tester is more than five times as sensitive as the most sensitive instrument hitherto produced by the company for this work. This enhanced sensibility permits the use of a single No. 6 dry cell as the source of rail current.

One of the first essentials in testing rail bonds is sufficient current in



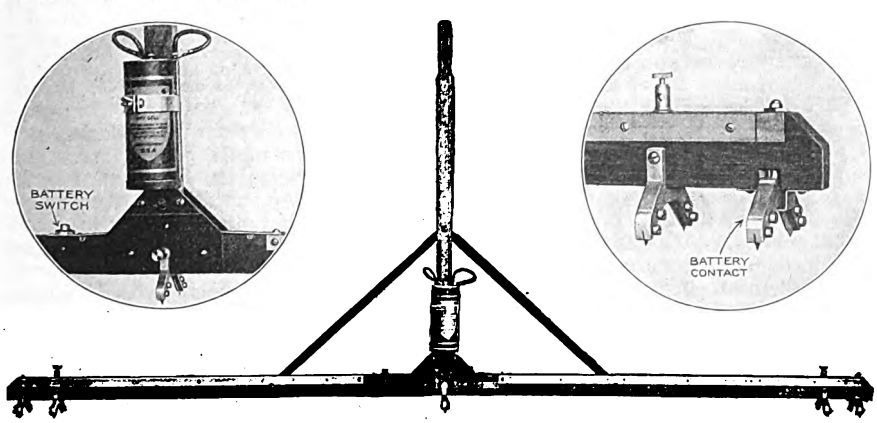
New BBT Type Bond Tester

the rail to actuate the bond tester. The method of measurement most commonly used is based on a comparison of the drop through the bond with the drop across a definite length of rail. On busy city lines there is usually a sufficient number of cars in service to provide the current necessary for bond testing, but on new construction, on interurban lines and at the ends of long lines it frequently becomes necessary to make special provisions in order to secure the needed rail current.

Various expedients have been used for this purpose, such as a portable storage battery, grid and other resistances, and in some cases special cars carrying motor-generator sets. All of these have the disadvantage that they include extra equipment which may be costly to operate and rapid testing cannot be made.

By providing an extremely sensitive instrument, the difficulty of a supply of rail current is overcome in the new Roller-Smith bond tester. Referring to an accompanying illustration, which shows the special contact bar used with the new BBT instrument, it will be noted that the dry cell is mounted in a bracket carried on the upright members. Built-in connections run from the dry cell to the rail contacts at the extreme end of the horizontal members. A foot-operated push switch is interposed in the battery circuit, which is located just to the side of the upright members. The center rail contact and one of the adjacent contacts span the bond, while the center contact and the one at the other end span 3 ft. of rail. When all is ready, the contact bond is dropped on the rail and the bar is run back and forth a few times so that the saw-blade contacts will bite into the rail head. The battery switch is then depressed with the foot and a reading is taken. The manually operated needle is rotated until the small galvanometer needle is at zero. The large pointer then indicates the resistance of the bond direct in units of foot of rail length.

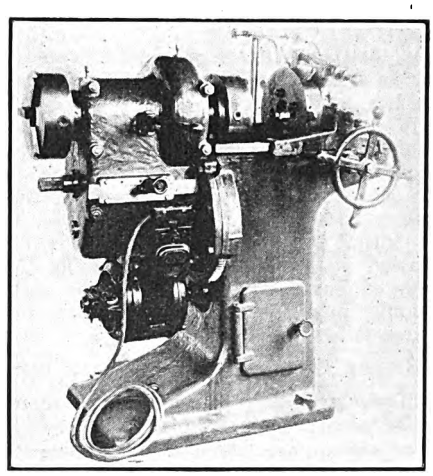
Of course, where the normal rail current is adequate, the dry cell need not be used. The latter, however, is small in size and does not increase the weight materially.



At Left, the Dry Cell Is Mounted on the Center Upright. In Center, Special Contact Bar Used in the Bond Tester. At Right, Saw-Blade Contacts Bite Into the Rail

Portable Pipe-Threading Machine

DESIGNED to meet all pipe-threading requirements, but with wheel mounting so that it is portable, a new power pipe-threading machine has been placed on the market by the Chicago Pipethread Machine Company, Racine, Wis. The machine will thread pipe from ¼ in. to 2 in. diameter and can also be used to thread rods and bolts. Three speeds are obtained through sliding gears and lever control. A clutch for starting and stopping the machine is located on the spindle. All gears are machine cut and run in oil.



Pipe-Threading Machine with New Features

At the rear of the die head is located the cut-off attachment, which is extra heavy. All sliding parts are accurately machined and gibbed to prevent vibration. The reaming tool is mounted on the cut-off block and is actuated by turning the handle toward the center of the machine after the cut. This can be accomplished without changing the location of the die head.

The spindle is of heavy construction with a hole large enough to pass the coupling. Chucks are mounted on each end, the front chuck being equipped with pipe-holding jaws, while the rear chuck is only a centering device for holding long lengths of pipe. Gripping chucks can be applied at both ends if desired. The spindle runs in large bearings that are replaceable when worn.

An oil pump of the centrifugal type is provided which runs at 1,800 r.p.m. It is located at the lowest level of the reservoir. The oil reservoir is located in the pedestal base.

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The News of the Industry

Rapid Transit Suggestions at Boston

Recommendations Made to Legislature Wants Steam Lines and "L" to Co-ordinate Service

A planning board of which Henry I. Harriman is chairman has reported to the Massachusetts Legislature on desired future developments of the rapid transit system for Boston. It proposes an eventual co-ordination of the Boston Elevated Railway with the steam railroads which enter Boston, but says that this calls for another year of careful study and asks for an extension of time to Jan. 1, 1927.

For the present the board recommends that the Chelsea division of the Eastern Massachusetts Street Railway be added to the Boston Elevated and the service given by the Elevated. It says that the Elevated should not be required to buy it, neither should the city of Boston finance it; but the state should buy the Chelsea division and lease it to the Elevated.

THREE SPECIFIC RECOMMENDATIONS

Three specific recommendations along this line are made, as follows:

1. For the acquisition of the Chelsea division of the Eastern Massachusetts Street Railway by the Boston Elevated Railway.
2. For the assessment of betterments in connection with future rapid transit extensions.
3. For the construction of rapid transit lines outside of the city of Boston by or under the supervision of the Department of Public Utilities.

Further the board makes suggestions for studies for future extensions of rapid transit for Metropolitan Boston. Among other things it concludes:

1. That most of the subways now used by trolley cars and the viaduct to Lechmere Square should at an early date be equipped with trains as parts of through rapid transit routes.
2. That all rapid transit routes should, if possible, be through routes without dead-end terminals in the heart of the city, thus giving a wide distribution of passengers in the downtown section and avoiding excessive congestion at any station.
3. That new subway stations should have a platform length of from 450 ft. to 500 ft. Such platforms will accommodate either a ten-car East Boston Tunnel train or a six-car Cambridge Subway train.
4. That reserved ways in certain avenues may properly be used in part for rapid transit trains.
5. That wherever possible rapid transit lines should utilize or parallel existing steam tracks, thus avoiding expensive subway construction.
6. That terminals of rapid transit lines should in most instances be located from 3 to 4 miles from the State House. Approximately half of the population of the metropolitan area lives within a 4-mile circle of the State House, and the bulk of the suburban traffic originating beyond the 4-mile limit uses railroad rather than Elevated service. It will thus be seen that if rapid transit terminals are located from 3 to 4 miles from the State House rapid transit service will directly serve a very substantial proportion of the city's population, and the number of passengers who must change at terminals will be greatly reduced. The Harvard Square and Everett terminals are almost exactly 3 miles from the State House. The present Forest Hills terminal and the new terminal of the Dorchester Subway are or will be about 4 miles out.
7. That wherever it is feasible to do so betterments should be assessed upon private property to pay for a part of the cost of rapid transit extensions. There can be no doubt that rapid transit service adds greatly to the value of much nearby property; and this division can see no reason why property that is benefited should not pay a reasonable betterment assessment and thus lessen the financial burden of the car rider.

Ultimately the following rapid transit extensions will be needed, according to the board:

1. Out Commonwealth Avenue to the Brighton district.
2. Out Beacon Street to Brookline.
3. Out Huntington Avenue to Brookline.
4. An extension through Lechmere Square and Somerville to North Cambridge.
5. An extension from the Everett terminal to Malden.
6. An extension of the present East Boston Tunnel to Revere or Chelsea or both.
7. Out parallel to the Midland Division to Dorchester.

New Year Starts Well in Twin Cities

Patrons in Minneapolis and St. Paul Accept Fare Advance Gracefully—Story of Terms of Settlement Reviewed Briefly—Company Has More than 100 Buses

RESIDENTS of Minneapolis and St. Paul met with equanimity the higher rate of fare in the Twin Cities ordered for Jan. 1, 1926, by the Minnesota Railroad and Warehouse Commission. The public and the press alike admit that the fare of 8 cents cash with six tokens for 40 cents appears to be necessary to return 7½ per cent upon the valuation as agreed.

The reason for this reaction is not far to seek. After several years the controversies with the Minneapolis Street Railway and the St. Paul City Railway are over, the expensive litigation at an end and employment of experts in valuation proceedings is stopped. As President Horace Lowry of the railways has said:

> We are now on a cost-of-service basis, which is the only way by which the interests of the public and the companies can be protected and a high state of service maintained.

St. Paul is well satisfied inasmuch as a higher rate would be required in that city than in Minneapolis because of the difference in cost of operation, amount of travel and extra high assessments by the city. These assessments, however, are likely to be reduced by the city upon petition by the railroad and upon suggestion by the commission. Were the company's taxes in Minneapolis reduced to a 4 per cent basis of gross earnings, as applied to telephone companies, the reduction in taxes would be $352,000 a year. This would of course affect fares favorably.

Up to and through the war period Twin City passengers paid 5 cents flat. Later this was raised to 6 cents flat. This was changed to 8 cents cash and ten tokens for 60 cents by an emergency order by the commission made on July 3, and effective Aug. 1 for a test of six months. About 10 per cent of the passengers have paid 8 cents. The commission now finds the estimate of the probable number of cash passengers was wrong.

Meanwhile, after the question of fare determination had reached the federal court, a proposal presented by Mr. Lowry suggesting a compromise was accepted by both cities. This agreement took into account the property valuations made by the commission as of Jan. 1, 1925, as a time saver, leaving for future consideration any necessary changes to bring these up to date. Application was made to the commission for a permanent rate and on Dec. 22 that body ordered for both cities a fare effective Jan. 1, 1926, of 8 cents cash, as now, and six tokens for 40 cents.

The order affecting St. Paul finds the company, on the basis of operating expenses for 1925, should have had a fare of 7.14 cents a passenger.

NEW RATE AVERAGES 6.8 CENTS

The average new rate of fare is 6.8 cents, the average asked by the city was 6.65 cents and by the company 6.92 cents. It will be seen that the rate fixed by the commission is between the city and company figures. The commission estimated that an average fare of 6.91 cents is needed to return 7½ per cent on the stipulated valuations of $26,787,228 in Minneapolis and $16,196,090 in St. Paul, but the commission says on this point:

> We have the assurance that all the earnings of the Twin City Motor Bus Company, which, like the railways, is a subsidiary of the Twin City Rapid Transit Company, in excess of 7½ per cent will be divided between the railways of Minneapolis and St. Paul. This excess is expected to bring a substantial revenue to the car lines.

Calculations by the commission necessarily were made partly upon estimates of operating expenses for the two lines to complete the figures for 1925. The companies recently increased the wages of trainmen and also added service at rush hours, which made an increase not expected when negotiations were begun for the new rate.

There was a matter of increased freight on coal, which later was adjusted by the companies.

Total operating expenses in Minneapolis before and after taxes for 1925 were determined thus:

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Railway operating expenses estimated, 1925 after 1925 adjustments, before taxes	$5,109,967
Further adjustments for 1926, 60 additional trainmen, starters and inspectors	66,807
Increased service proposed, 459,000 car-miles	84,134
Increase of 2 cents an hour per trainman	81,149
Way and structural equipment expense, adjustments to make estimate conform with company estimates for 1926	25,187
Reduction on law and valuation expense from total of $65,599 to $50,000	—15,599
	$5,351,645
Taxes assignable to railway operations	847,675
Total operating expenses and taxes	$6,199,320

The tax rate has been increased from 69.16 to 73.37 per $1,000, assessed valuation increasing the local taxes to be paid in 1926 by the company $35,543 over 1925. This makes the assessment against the Minneapolis Street Railway 10.4 per cent of gross revenues in 1925 if there is no change in the federal income tax. The commission says that since this percentage of gross revenue is 50 per cent greater than the average taxes paid by electric railways of the United States in 1924, with the $35,543 increase and local taxes and state taxes for 1925, these taxes will be $652,932, including federal income tax. This amounts to about 8.7 per cent of the gross revenues estimated for 1925.

In regard to the St. Paul case the commission said:

> The fare which we have this date fixed, which will yield to the Minneapolis Street Railway a reasonable return on the fair value of the railway property within the city of Minneapolis, we therefore fix and establish for St. Paul.

It was expressly stated there should be no change in the transfer privileges. It was also incorporated in the Minneapolis order that the Fort Snelling reservation comes within the one-fare limit from Minneapolis.

Although the Twin City Rapid Transit Company, operating the Minneapolis Street Railway and the St. Paul City Railway, was permitted in the final decision to redeem the outstanding tokens Jan. 1, 1926, at 6 cents, the company made no announcement of its intentions until late Dec. 31, and from that time until midnight the conductors were swamped with purchasers at the old rate. It is estimated the company stands to lose $17,000 by this friendly act. At least 2,500,000 tokens were still out on Jan. 1. Where tokens were unavailable patrons were instructed to pay 6 cents cash fare until midnight, the company waiving the extra 2 cents cash because it was unable to supply the demand.

Through the dissolving of an injunction brought by a stockholder of the Minneapolis & St. Paul Bus Line, Inc., against the sale of that property to the Twin City Rapid Transit Company, the railway will acquire the remaining independent bus line between Minneapolis and St. Paul. It operates through the University and Como Park districts of the two cities. This line has twelve modern buses. The purchase price is reported to be $105,000. Acquisition of this bus line will give the railway 100 buses.

In addition the Twin City Rapid Transit Company operates through a subsidiary the Twin City Motor Bus line between Minneapolis and St. Paul, the American Auto Bus Company line between St. Paul and Minneapolis and suburbs and the Intercity Transportation Company between St. Paul and Stillwater.

What Basis, Fares at Detroit

The matter of increases in fare at Detroit, Mich., has not been formally presented to the Street Railway Commission, but the subject is being studied by the commission's engineers. The present rate of fare in Detroit is 6 cents cash with nine tickets for 50 cents and an additional charge of 1 cent for a transfer. Extending service to Redford, which has recently been annexed to Detroit, will call for considerable increase in the length of haul on the Grand River car line.

The questions under consideration relate to the adoption of the zone system of charging fares commensurate with the length of hauls or keeping the fare uniform and raising it to cover the increased cost of the longer hauls. The justice of raising fares all over the city to pay for carrying passengers to the newly annexed districts is being considered with the alternative of each passenger paying for the ride he takes.

Col. H. U. Wallace, general manager of the Department of Street Railways, said recently:

> I am certain that, so far as present services are concerned, there will be no increases. What we have to do is face the question of long haulage to recently annexed territories, such as Redford.
>
> We propose to establish a bus service to Redford about next June and we have under investigation the question whether we can make this extension and meet the expense out of general revenue; whether we should make this individual service self-supporting, and whether it would be fair to saddle car riders in general with any deficit that might be met in operating this service. None of these questions has been decided.
>
> But there will be no increase in fares so far as present car riders are concerned. On the contrary, the department is planning to meet all expenditures, most of which should be capital, out of revenue. Our budget of next year calls for about $1,500,000 outlay, but this will be met by earnings.
>
> We are paying the Detroit United Railway 25 per cent of our profits to amortize its debt. That is a real achievement in the history of municipal ownership. In another six years we shall have fully met that obligation and the money then will be available for improvements and possibly for fare reductions. Our problem is to hang on for six years, give adequate service and at the same time incur no further obligations.
>
> That we are aiming to do. We hope to take care of maintenance, repairs, sinking fund charges and operating expenses out of revenue derived from a 6-cent fare. We hope to make adequate improvements out of the same revenue. If we can do this for the next six years we shall have made the department pay for itself. After that we shall be free to improve the service considerably and possibly reduce fares.

Mr. Storrs Outlines Progress for the Press

Lucius S. Storrs, managing director of the American Electric Railway Association, says that 1925 was marked by distinct progress in the local transportation industry. In a statement which he made to the daily press in the interest of the industry Mr. Storrs said electric car and bus service is being rapidly co-ordinated under single managements in most communities, electric lines are being modernized, credit is being slowly restored, and the public, realizing the necessity for good common carrier service under responsible electric railway agencies, is showing an increasing desire to work with local managements in solving current problems.

He explained that the initial efforts of the Advisory Council have been directed toward effecting sensible coordination and modernizing properties and thus improving credit. Useless competition, resulting in duplicated service and doubled and tripled fares, is being supplanted by community-wide service under single managements operating economically. More than 250 electric railways now are operating bus service with some 5,000 vehicles over about 12,000 miles of route. This represents an increase over 1924 of 80 operating companies, a doubled number of buses and tripled miles of service. Mr. Storrs explained that the importance of this changed situation is not so much in miles of added service as in the recognition of managements that they no longer are merely rail operators, but general transportation agencies ready to render service by any useful vehicle the public demands.

The local transportation situation as leaders see it was summarized by Mr. Storrs as follows:

> A demand for good transportation, both by electric car and motor carriers, exists. It is the duty of electric railway companies, as the oldest and most reliable transportation agencies, to supply this transportation. They will supply it with the most modern equipment as rapidly as possible.

Franchise Negotiations at Richmond Halted

Luke C. Bradley, president of the Virginia Electric & Power Company, Richmond, Va., expressed regret at the present halt in negotiations to obtain a blanket traction franchise because of provisions required of the company by the streets committee of the City Council. He regards the terms sought to be imposed as excessive. The committee proposed to recommend a 5 per cent tax on gross receipts and the removal of toll charges on the company's viaducts, but sought to require the company to continue paving between tracks. Mr. Bradley said:

> We do not feel that it is fair to the company nor to the car rider that the city impose on them over and above what it imposes on any other individual or corporation a gross earnings tax, which can tend only to stifle a proper expansion of Richmond's transportation facilities and make the cost of fares to the car rider more expensive.

No Jitneys in Savannah

There are no more jitneys now in the city of Savannah, Ga. The one remaining line there ceased operating on Dec. 31, 1925. The regulatory ordinance passed in May designated Oct. 1 as the last day the jitneys would operate. The jitney people took this matter to the courts and they were allowed under a temporary injunction to operate until their 1925 licenses expired. The city took the matter to the Supreme Court of Georgia hoping to get a decision before the year was out. However, the Supreme Court has up to this time handed down no decision. The theory as to their right to operate the balance of the year was confined to their licenses having been issued for the full year. The licenses, however, have now expired.

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Transportation Committees of Springfield and Worcester Meet

Two joint committees, composed of civic representatives, officials of the Springfield and Worcester properties, and representatives of the New York, New Haven & Hartford Railroad, were recently formed and initial meetings of each have been held.

In Springfield the Board of Survey, composed of Clark V. Wood, president of the Springfield Street Railway, and W. J. Flickinger, vice-president of the Connecticut Company, now under the management of the New York, New Haven & Hartford Railroad, met for the first time on Jan. 5 and secured considerable data from the city traffic expert, J. T. B. Woodruff, who will assist the committee in its investigation. Primarily, the findings of this committee and the traffic expert will form the basis of a report on transportation in Springfield. Coincidently in Worcester, Mayor O'Hara and President R. L. Whipple of the Chamber of Commerce have appointed the following committee to study the Worcester transportation situation: William C. Mellish, city solicitor; Prof. Albert S. Richey, Worcester Polytechnic Institute, and F. H. Willard, vice-president and general manager Worcester Consolidated Street Railway. These men will confer with Clark V. Wood, president of both the Worcester Consolidated Street Railway and the Springfield Street Railway, and W. J. Flickinger, vice-president of the Connecticut Company, who represents the New Haven interests. This committee has been authorized to study the railway situation in Worcester. It will start its work immediately.

All of this work has a direct bearing on the possible rehabilitation of both of these properties by the New Haven Railroad. Certain legislation will have to be accomplished before it will be legally possible for the New Haven to re-establish its interest in these properties. The New Haven naturally desires the co-operation of the two cities in obtaining this legislation and has therefore been instrumental in the formation of these committees to study the situation and determine whether the cities wish to go on as now or prefer to have the New Haven exercise control and rehabilitate the properties.

Fare Increase Sought at Albany

It is said that a modified petition for an increased fare, specifying no amount, but asking a "fare rate," will be presented to the city officials of Albany, Troy, Rensselaer and Cohoes by the United Traction Company. In its petition, the company will say that after operating buses in Albany and Troy as feeders for its main lines, it has been found the company with the present 7-cent fare still will suffer a shortage of approximately $300,000 for the twelve months ended Dec. 31.

Ernest Murphy, superintendent of the company, is reported to have said that the company will first seek relief from Common Council of Albany, and if that fails, will file a fare petition with the Public Service Commission. A petition for a 10-cent fare, filed a year ago, was temporarily withdrawn when the city of Albany granted the company a franchise to operate buses in Western Avenue and to the Arbor Hill section, suggesting that further action be delayed pending actual experience from revenues derived from the feeder lines.

Result of Ontario Elections

Hamilton Abandonment Averted—St. Thomas to Have Buses—London in Deadlock

Residents of Hamilton, Ont., were able to indulge in the usual holiday merriment because the expected abandonment of service by the Hamilton Street Railway was averted for about five weeks. At practically the last moment the company agreed to accept the city's proposal to negotiate for a new agreement and to submit the agreement to the voters on Feb. 11. The possible suspension and eleventh hour avoidance of it were brought about by the defeat of the two railway by-laws on Dec. 7, referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 12, 1925, page 1048. The people opposed the city's purchasing the system and also opposed the company's receiving a 25-year franchise.

To insure continued service the City Council on Dec. 9 approved a plan to submit a new agreement to the people within 60 days. The Council's action does not mean that the city has withdrawn the application of Dec. 8 to the Ontario Railway Board to operate the street railway. This application will merely be held in abeyance pending negotiations with the company. Should the city and the company fail to reach an agreement, meriting another vote of the people, then the Council will halt such negotiations and call upon the Railway Board to act.

The terms under which the company and city agree to carry on for 60 days are:

1. That the city enter into an agreement with the company and forego its percentage and mileage charges during the period in question.
2. That the Board of Control and the Civic Street Railway Committee be authorized to negotiate with the company respecting a new agreement to be submitted to the electors prior to Feb. 11, 1926.
3. That the Board of Police Commissioners be requested not to issue any additional jitney licenses from Dec. 11 until Feb. 11.

The defeat of the by-laws in Hamilton was a surprise. Only a few days previous to the vote the Hamilton Street Railway had consented to revise the proposed franchise agreement by giving the city the right, at the close of any five-year period, to purchase the system upon certain conditions. This condition had been accepted by the Board of Control and street railway committee of the Council. The company's original stipulation was that one year's notice of purchase would be required and that the purchase price would be 10 per cent more than the valuation of the company's assets. It voluntarily went further than that, submitting instead of a straight 10 per cent bonus demand a sliding scale which reduces the bonus percentage at stated periods in the life of the agreement.

The company had advised the city authorities verbally on Sept. 30, and formally on Nov. 3, through the press, that unless some workable agreement was reached, it would have to cease operation.

The latest development in the London situation reveals that the London Street Railway has been allowed a 5-cent fare for 60 days pending a new agreement. However, the City Council on Dec. 30 refused the company's application to order the independent buses off the streets and service has been terminated. The London Council has issued an ultimatum to the company to define its plans within forty-eight hours. The immediate trouble in London dates back to Dec. 12, when the Ontario Railway and Municipal Board issued an order requiring the company to revert to the old rate of fares, seven tickets for a quarter good between certain hours and nine for a quarter good between other hours. In London, as in Hamilton, abandonment was averted at the busiest time of the year by the announcement of a special meeting of the City Council called in an endeavor to have the railway continue until a new franchise could be discussed. Later reports stated that the London Street Railway at a special meeting of the finance committee of the City Council would lay a proposal before that body for a complete service of street cars and buses with slightly higher fare and universal transfers.

In St. Thomas, another city of Ontario, the trolleys are to cease operating on March 1. At the wind-up meeting of the 1925 City Council the by-laws carried at the election on Dec. 7 discontinuing the railway and accepting a bus transportation proposition were read for the third time and formally passed. The contract with the bus company provides that the new system will come into operation within 60 days of the signing of the contract. The St. Thomas Municipal Street Railway operated 6.5 miles of line.

Detroit United Adds Cars to Combat Buses

The Detroit United Railway, Detroit, Mich., has added ten interurban cars on Detroit-Royal Oak division on a fifteen-minute schedule. The previous schedule was 20 to 30 minutes. The Detroit Motor Bus Company has petitioned the Public Utilities Commission to operate buses on fifteen to twenty-minute schedule between Detroit and Pontiac and D. U. R.'s action is seen as an attempt to combat bus competition.

Agreement Among St. Louis Holders

Security holders of the United Railways, St. Louis, Mo., have reached a complete agreement on terms for the reorganization of the system. Federal Judge Faris of the Eastern District of Missouri was so informed on Jan. 5. A termination of the receivership of the company is anticipated within a reasonably short time. The court continued until Feb. 15 the hearing of the consolidated foreclosure suits brought against the property under which the receivership will be dissolved.

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Fare in Spokane to Be Contested

Despite reports generally accepted that the City Commissioners of Spokane, Wash., would not contest the new street car rates filed with the State Department of Public Works of Washington by the Spokane United Railways, the City Council voted unanimously on Dec. 30 to protest the fare increase.

Charles A. Fleming, Mayor, and James M. Geraghty, corporation counsel, were authorized and instructed to oppose the increase, at a hearing to be held in Spokane about Jan. 15. Previously, officials of the Department of Public Works announced they had been told the United Railways and the Spokane City Commissioners had agreed upon the new fare of 10 cents cash with five tickets for 35 cents, which was to become effective on Feb. 1.

Intensive Development Planned in San Francisco

Samuel Kahn, new executive head of Market Street Railway, San Francisco, Cal., now under H. M. Byllesby & Company's control through United Railway Investment Company and its subsidiary, California Railway & Power Corporation, says it is the Byllesby purpose to continue to operate the lines in accordance with the best public utility practice and also to continue their development. He is reported to have said:

> It is our purpose to protect our investment here by efficient operation and by taking the public into our confidence. We are entertaining no plan nor are we contemplating any step toward attempted sale of the properties to the city.

Mr. Kahn denies reports that the company will campaign for increased fares and that it is proposing a bond refunding operation.

Since Byllesby interests have obtained control of the Market Street Railway, a compromise has been effected with the Pacific Gas & Electric Company over litigation which resulted when the tram company sued to enjoin the power company from collecting $420,000 on increased rates granted by the Railroad Commission of California in 1921. The petition for dismissal of the suit has been heard in the Circuit Court of Appeals.

Referendum in Jacksonville

Voters of Jacksonville, Fla., will decide at a referendum in March whether or not the city will acquire the Jacksonville Traction Company by purchase and then operate the road. A decision to this effect was rendered by the City Council on Dec. 22, 1925, when Councilman P. A. Holt introduced a resolution providing for a vote on the matter that has been agitated for some time.

The Holt resolution refers to "the crowded condition and congestion of the street car traffic" and "the confessed inability of the company to remedy the situation" with the consequent necessity for some definite plan of procedure. One of two plans will be adopted. Either the city will take over and operate the property or a franchise will be granted to the present company or to some other company. The resolution further stated that it would be necessary, if the city decided to take over the property, for the Legislature to pass an enabling act and that it was unfair to delay action until conditions became intolerable.

A Lesson in Safety

A practical demonstration to teach school children how to board and leave street cars safely, was carried on by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., under the direction of A. W. Koehler, safety engineer of the company, school teachers, street car conductors and motormen. A vestibuled-trailer and a rear-end pay-as-you-enter type of car were both sidetracked near the Shorewood graded schools which were used by all children from the first to the sixth grade to acquaint them in all phases of car safety under the eye of teachers and railway safety engineers. Following blackboard lessons in the classroom, the pupils visited the two sidetracked street cars. Then putting to use the lessons they learned, the youngsters one by one stepped out from the curb, looked each way for approaching automobiles and boarded the car.

Ten Cents Sought in Boise

The Boise Street Car Company, Boise, Idaho, has applied to the Public Utilities Commission for a 10-cent cash fare instead of the 7-cent fare now charged and a ticket rate of 7½ cents instead of one of 5 cents now in force. Increases are also proposed in the cost of tickets issued to school children from the present 2½-cent rate to 4 cents or 25 tickets for $1. This action follows close upon the heels of the request of the Boise Valley Traction Company for increases on the South Boise and the Boise city belt lines. The increases are identical for both companies.

Two applications were recently presented to the City Council for franchises to operate buses in the city.

Appeal on One-Man Car Ruling in Dayton

Notice of an appeal to the United States Circuit Court of Appeals at Cincinnati was given on Jan. 2 from a decision handed down recently by Judge Smith Hickenlooper in federal district court holding invalid an ordinance adopted by the city of Dayton prohibiting the use of one-man cars. The appeal notice was given by Guy H. Wells, assistant city attorney of Dayton. The case is expected to be heard in March.

The appeal is based upon the claim by the city that the City Commission had a legal right to pass and enforce the ordinance and that the United States District Court had no jurisdiction in the matter. The ordinance barring the one-man car from the streets of Dayton was adopted some months ago following the receipt of petitions from Dayton residents. The City Railway took the matter into federal court and also obtained an injunction restraining enforcement of the ordinance until the courts had passed upon its validity. Reference was made to the recent court decree in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 12, 1925, page 1047.

Frankford Line to Be Developed

Plans for the operation of the newly acquired Frankford, Tacony & Holmesburg Street Railway by the Philadelphia Rapid Transit Company, Philadelphia, Pa., were recently announced. The road, which was purchased for $300,000, is now operating as Route 66. The 7½-cent city fare will be extended on Frankford Avenue by free transfer as far north as Blakiston Street, with a 7½-cent additional charge to the city line.

Users of the line will benefit by the reduced fare. Free transfers will be given between other routes. Tickets of the Frankford, Tacony & Holmesburg Street Railway will not be accepted as fare, but will be redeemed. A bus line has also been put in operation. The fare on the buses will be 10 cents with 3-cent exchange to and from all connecting P.R.T. surface and elevated lines. The old equipment has been superseded with P.R.T. cars and buses. The new project will be financed by the sale of the Philadelphia Rapid Transit Company 7 per cent preferred stock to riders in the Northeast section.

An effort was made on Dec. 29 to block the sale of the Frankford, Tacony & Holmesburg Street Railway to the P.R.T. interests by an application in the Common Pleas Court for the appointment of a receiver for the Northeastern Philadelphia Transit Company, which, at a public sale by receivers on June 19 last, acquired the franchises and property of the Frankford, Tacony & Holmesburg Street Railway for $350,000. Arrangements were made, however, by agreement between the P.R.T. and the bondholders' protective committee of the Frankford, Tacony & Holmesburg Street Railway to postpone the date of settlement to fifteen days after the final termination of this litigation, but not later than June 30, 1926.

News Notes

Line Offered to Responsible Company.—Representatives of the Chautauqua Traction Company, who recently applied to the Public Service Commission for permission to discontinue service from Asheville to Mayville, N. Y., have offered to turn over all their facilities in that section to any responsible organization which will guarantee to maintain regular service. The proposition was submitted to representatives from the Jamestown Chamber of Commerce.

Will Meet to Discuss Traffic Problems.—A large public meeting for the consideration of traffic and parking problems of the city is the plan of a special committee appointed recently by the Salt Lake City Chamber of Commerce. This meeting will be held at the headquarters of the Chamber of Commerce in that city on Jan. 13. It will be attended by city officials, members of civic organizations, business men and others who are interested in alleviating traffic difficulties in Salt Lake City.

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Wages Unchanged. — Carmen and other employees of the South New Orleans and the West New Orleans Light & Traction Company, Algiers, La., have signed an agreement covering wages and working conditions for the next two years, effective Jan. 1, 1926. The wages remain the same. The working conditions have been slightly changed, to the satisfaction of both the carmen and the street car officials.

Franchise Endangered. — The Western Ohio Railway, operating between a number of cities in Hancock, Allen, Mercer, Shelby and Miami counties in Ohio, with a large power plant in St. Mary's, Ohio, may lose its franchise privileges in St. Mary's under a city ordinance. The city administration charges that the company for years has violated stipulations of its franchise in that its tracks have not been kept in conformity to the street grades. Should the cars be barred from St. Mary's streets it would mean discontinuance of interurban service to New Bremen, Minster and Celina.

Fares Now Two Cents a Mile.—Permission was granted recently by the Public Service Commission to the Kaw Valley & Western Railway, an interurban operating between Kansas City and Lawrence, Kan., to make effective on Jan. 1 a schedule of passenger rates based on a charge of 2 cents a mile for one-way passage. The company also was authorized to base round-trip fares on a 3½-cent one-way mileage basis. The schedules will be filed later and formally approved. A short time ago the company received permission from the Public Service Commission to establish a maximum rate of 75 cents for the longest round trip on its line. Prior to that the rate between Lawrence and Kansas City had been 75 cents one way.

Second Edition of P. R. T. Guide.—A second printing of the P. R. T. route guide of trolley, subway-elevated and bus service in Philadelphia, Pa., has been found necessary. Copies are being placed on the cars for sale at 10 cents each. The proceeds from the sale are given to the Helping Hand Fund, used to relieve employees in temporary financial embarrassment.

Tariff of Poughkeepsie-Wappingers Falls Detailed.—The official tariff of changes in fares on the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 12, 1925, page 1049, provides with respect to the Poughkeepsie-Wappingers Falls monthly commutation ticket books as follows: Monthly commutation ticket books with coupons attached equivalent to 52 rides in and between the city of Poughkeepsie and the village of Wappingers Falls will be sold for $7.80, subject to conditions of sale and use of monthly commutation ticket books. With respect to the Kingwood Park monthly commutation ticket books it provides as follows: Monthly commutation ticket books, with coupons attached, equivalent to 52 rides in and between the city of Poughkeepsie and Kingwood Park, or in and between the village of Wappingers Falls and Kingwood Park, will be sold for $5.20, subject to conditions of sale and use of monthly ticket books.

Recent Bus Developments

Three Months Test at New Fare on Washington Buses

At a public hearing before the Public Utilities Commission of the District of Columbia on Dec. 30 talk of a merger of all street car and local bus lines was renewed and free universal transfers assumed the proportions of a probability in the near future. The Washington Rapid Transit Company, operating buses and now controlled by the North American Company, volunteered a temporary experimental reduction in fares and asked postponement of consideration of petitions for new bus lines in Sixteenth Street, Northwest.

William McK. Clayton, who had filed the petition for reduction of bus fares from 10 cents cash, five tokens for 45 cents, presented his argument in behalf of the Federation of Citizens' Associations. He said the company could well afford to reduce fares to six rides for 40 cents.

At the conclusion of his remarks the spokesman for the bus concern asked the commission to permit the company to reduce the fares for three months to 10 cents cash, six tokens for 50 cents, and defer further consideration until it was ascertained what income these rates would yield.

Mr. Clayton said he would not object to the sale of three tokens for 25 cents and free transfers at certain points to the lines of both the Washington Railway & Electric Company and the Capital Traction Company. The bus company refused to yield on these points and the commission ruled that its request be granted.

Following the hearing, Lieut.-Col. J. Franklin Bell, engineer commissioner, said:

> It may be that the bus company can afford more of a cut in fares. If so, it will be demonstrated during the three months of testing the new rate. I am more interested in free universal transfers between all street car and bus lines. During the three months we will give consideration to that also. I would not be surprised if a definite merger plan were worked out in the meantime.

The commission entered an order effective on Jan. 1 for a period of 90 days authorizing the company to reduce rates to six tokens for 50 cents, the cash fare to remain unchanged. Transfer privileges continue as heretofore.

Local Licenses Needed in Massachusetts

THE full bench of the Supreme Court of Massachusetts, in three decisions handed down together, has decided it is illegal to transport passengers in buses between points within the Commonwealth of Massachusetts without securing the local license necessary under the statutes, even though the parties operating the buses incidentally do an interstate business. A fourth opinion was that under the criminal law an employee of a bus line may be prosecuted for operating a bus where the owner did not have the statutory licenses.

Method of Accounting for Bus Purchase Specified

In an order made recently authorizing the sale and transfer by Benno Baur of bus certificates and bus equipment on a line between Fort Wayne and Angola and another between Angola and Lake James to the Indiana Service Corporation, operating an interurban electric railway, the Indiana Public Service Commission places definite restrictions regarding the capital account. The order was written by Samuel R. Artman.

Mr. Baur's lines are known as the Northern Indiana Bus Company. The equipment consists of two twelve-passenger automobiles. Mr. Baur's sale price was $5,000 for the two bus certificates and $4,000 for the buses. The order said the vehicles are reasonably worth the sum stipulated and that the original cost was $6,400. Mr. Baur already has set aside, under the commission's orders, $170.66 in a depreciation fund and has paid out of that sum $100 in depreciation expenses.

The order authorizing the sale provides specifically that as a part of the sale Mr. Baur shall transfer to the buying concern the balance in the depreciation fund and that the buying concern shall maintain and use it as the law provides in regard to depreciation.

Another provision of the order was that the $5,000 of the purchase price, which represents the sale price of the certificates, is approved on the express condition that:

> The Indiana Service Corporation shall not carry said sum of $5,000 into its capital account so as directly or indirectly to constitute any part of the value upon which rates of service are to be charged, or so as to constitute any part of the value against which stocks, bonds, notes or other evidences of indebtedness may be issued by said purchaser and upon condition that the said sum shall not be directly or indirectly charged as an operating expense.

Electric railway companies long have become used to depreciation account and to selling bonds to cover the purchase of new equipment. Many of the independent bus operators, however, are expected to contest the decision, especially with regard to the depreciation fund. In case these companies lose in the contest, a revision of bus rates upward is certain to be the result, since it is generally conceded that operators cannot put aside this sum at present fares and continue to operate successfully.

Door-to-Door Service by Illinois Traction

The Illinois Traction System, Peoria, Ill., included in the Illinois Power & Light Corporation, believes that there is a field for freight and express traffic through the medium of motor trucks. The company has been exhibiting in the various cities through which it oper-

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ates a fleet of 1-ton trucks, built especially for this service. Starting from Springfield on Dec. 26, the fleet made the circle of the various cities on the traction line. After the caravan has appeared in parade formation at all points, there will be a distribution to the various cities according to population and they will be placed in immediate service, picking up freight and express and delivering it to shippers and patrons of all kinds.

Competitive Indiana Bus Lines Seek Higher Fare

The application of the Indiana Red Ball Lines, Inc., for increased rates will be taken up by the Public Service Commission on Jan. 25. It is expected that Clyde H. Jones will preside. The Hoosier Stage Lines, Inc., operating bus lines that connect Indianapolis, Muncie and Marion, has also appealed to the commission for relief in this direction and a hearing will likely be set for some time in February. The company claims that its present rate of 2 cents a mile is inadequate to permit a profit. The company competes with the Union Traction Company. The Red Ball Lines simply asked the commission to authorize an increase which would meet the expenses of operation, taxes, and depreciation and to provide a fair return. The company succeeded the Hiner Red Ball Lines and operates twelve bus lines in Indiana. There has been a steady increase in the number of passengers handled, but an operating deficit will continue to exist, it is argued, until the rates are advanced. Fred I. Jones is receiver for the company. Unless relief is given, it is predicted that a number of the bus lines will be forced to suspend.

Bus Company in Beech Grove Loses Point

A controversy affecting the Beech Grove Traction Company, the citizens of Beech Grove, Ind., and the South Side Motor Coach Company, in which the citizens took sides with the traction company, has resulted in a decision which probably will set a precedent for city regulation of transportation systems. The town board instituted proceedings through a city ordinance to make the coach company keep off streets used by the traction company. The bus company filed proceedings in the Superior Court in Indianapolis to prevent the town board enforcing the ordinance, the constitutionality of which was questioned. The attorneys for the bus company argued that through the certificate granted by the Public Service Commission the company automatically received the right of the streets. Attorneys for the town board argued that the Public Service Commission's authority ended with the granting of the franchise.

The court ruled that the Public Service Commission had exhausted its authority when it granted a certificate to the bus company. The franchise, so the court held, was granted with the understanding that all authority vested in a municipality was not nulled. He said the town was within its right in designating streets for the bus company.

Crosstown Bus Service in Boston Well Patronized

The Boston Elevated Railway, Boston, Mass., has tried out a plan to operate buses between North Station and South Station in Boston on a reduced scale of fares, and has found it to be a paying service, which will be permanent. The single fare is 10 cents, but five tickets are sold for 30 cents.

Additions to rolling stock and further extension of bus routes that will serve downtown districts were outlined by Edward Dana, general manager of the Boston Elevated Railway, in a statement given out on Jan. 5. Double-deck buses are contemplated for the Boylston Street line, and in addition to this popular type of equipment 62 new steel cars will be added for street car lines.

Takes Over Three Lines in Indiana.—The Indiana Service Corporation has been authorized by the Indiana Public Service Commission to take over the operation of three bus lines running out of Fort Wayne, Ind. The lines purchased are those operating between Fort Wayne and South Bend, between Fort Wayne and Marion and between Fort Wayne and Warsaw. The purchase price of two routes was $10,500 and the other $21,000.

Will Ship Freight by Truck.—The Worcester Consolidated Street Railway, Worcester, Mass., in addition to operating buses into Clinton will substitute a fleet of trucks for the freight cars in carrying express and freight parcels between Clinton and Worcester. The old plan was for the trolley freight to deliver and accept shipments at its freight terminal in Clinton. Under the new plan the trucks will call and deliver at the stores and mills. It is reported that the company is planning to purchase its own fleet of trucks for this service and also for similar service in other places, where the trucks will replace trolley freight cars.

Independent Company Favored.—Residents of East Wheeling and those riding buses from North End to East End, in Wheeling, W. Va., will secure a reduced bus fare following the recent action of the City Council in recommending to the State Road Commission the granting of a permit to the Bellaire-Neff Bus Company to operate after the first of the year. The bus subsidiary of the Wheeling Public Service Company, which has been operating for some time, has discontinued. The new company will charge a 5-cent cash fare, with a 4-cent rate by weekly tickets and a 3½-cent fare by monthly tickets. The attitude of the Wheeling Traction Company was that these rates are inadequate.

Buses Started in Place of Cars.—Bus service was substituted for street cars locally in Gulfport, Miss., and between Gulfport and Pass Christian on Jan. 1 by the Mississippi Power Company, which controls the Gulfport & Mississippi Coast Traction Company. The street cars still operate between Gulfport and Biloxi. Buses replace the cars with a fifteen-minute service on the Gulfport City line and 30-minute service on the lines to Long Beach and Pass Christian. No change has been made in fares. The stop system is similar to that previously maintained by the railway. Railway employees were trained as bus drivers since the bus equipment arrived last fall.

In Command of Bus Operations.—Peter J. Calderone has transferred his ownership of eight bus lines operating between the Pawtucket Valley and Providence, R. I., to the United Electric Railways, and the latter company has now gained full control of motor operations in that section. Permission has been granted the company to combine the eight certificates into one. Mr. Calderone only recently purchased the eight bus lines from eight individual owners. The transfer of the bus properties to the railway was concluded on Dec. 28.

Opposes Motor Line.—Protests have been filed with the Ohio Public Utilities Commission by the Lake Shore Electric Railway, Cleveland, and the Northern Ohio Traction & Light Company, Akron, against the application of the Motor Freight, Inc., Detroit, for a certificate to operate motor trucks between Detroit and Akron, via Toledo and Cleveland. Both protests charge that the proposed motor line would be in direct competition with established electric lines.

Bus Fare Lowered.—The Washington Railway & Electric Company, Washington, D. C., has been authorized by the Public Utilities Commission to reduce the rate of fare on its Rhode Island Avenue bus line to six tokens for 50 cents, the cash fare to remain the same. The company is also ordered to give free transfers which will be good on any intersecting car or bus line of the Washington Railway & Electric Company or any intersecting car line of the Capital Traction Company, on payment of a 10-cent cash fare or payment of one ticket or token and 2 cents.

Bus Transactions to Be Concluded.—Arthur W. Brady, receiver of the Union Traction Company of Indiana, has been authorized by the Circuit Court at Anderson, Ind., to complete a recent transaction by which the company and the Indiana Service Company contracted to buy eight buses of the Interstate Safety Motor Coach Company, operating between Indianapolis and Peru and Fort Wayne. In the receiver's petition for authority, it was said that the Union Traction would pay $54,395 for five of the buses and the Indiana Service Company would pay $25,695 for three buses. The Union Traction will operate between Peru and Indianapolis and the other company between Peru and Fort Wayne.

So-Called Reading Case Continued.—After an all-day hearing on Jan. 6 before the Public Service Commission of Pennsylvania the so-called Reading case was continued for two weeks in order to permit the introduction of additional data. In this proceeding the electric railways are opposing the proposal of the Reading Railroad through its subsidiary, the Reading Transportation Company, to operate buses parallel to the existing electric railways and bus lines in Schuylkill County, Pennsylvania. This case was referred to in the JOURNAL for Dec. 19, page 1092.

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Financial and Corporate

Kansas City Road Sold

Property Purchased by Attorney Representing Committee Acting for First Mortgage Holders

All the properties of the Kansas City Railways, Kansas City, Mo., were bid in at the foreclosure sale of the company's assets on Jan. 4 by P. C. Groner, Chicago attorney, acting in behalf of the reorganization committee. The Missouri and the Kansas properties of the company were first offered for sale separately by John T. Harding, special master commissioner, but Mr. Groner, the only bidder, was silent until the properties were offered as a whole, when he entered a bid of $8,000,000 for the property in its entirety.

Mr. Harding expressed the intention of reporting the sale promptly to Judge Kimbrough Stone, referee, before whom it must come for confirmation in the federal court. Upon its confirmation, the sale will eliminate all interest in the Kansas City Railways of J. Ogden Armour, for many years a dominant figure in the railway, as well as the other remaining stockholders of the old organization.

Approximately $47,000,000 in liens against the property are said to have interposed between Mr. Armour's stock and his possession of the property. In claims presented in behalf of Mr. Armour no mention had been made of the stock held by him in the old organization, but he made several attempts to collect approximately $2,000,000 for funds which he is said to have personally advanced the company shortly before the receivership.

Blatchford Downing, attorney for the second mortgage bond holders, was an observer of the foreclosure sale. The second mortgage bond holders have so far been left entirely out of the reorganization plan, having first refused an offer of five shares of stock for each $1,000 in second mortgage bonds held in the old company and, later, refused an offer of 20 cents on the dollar as a cash compromise. Mr. Downing did not contest the court's final order of foreclosure, but he indicated last May that he would press the contentions of his clients when the sale comes before Judge Kimbrough Stone for the necessary confirmation. In the meantime Francis M. Wilson and Fred W. Fleming, the receivers, will remain in charge of the property.

In qualifying himself as a bidder Mr. Groner presented Mr. Harding, special master, with certificates conveying a total of $854,000 in first mortgage liens on the railway property as a bond binding the sale.

In his preliminary explanation of the bid Mr. Groner said a nominal bid of $8,000,000 was made as representing the approximate present market price of the first lien securities. He said the postponement of the sale at his request from Dec. 15 had resulted in deposits by the first mortgage bond and note holders of an additional $150,000 in bonds.

In presenting the bid Mr. Groner said he represented more than 7,000 holders of first mortgage notes and bonds, owning more than 96 per cent of all the first liens against the property. He also announced that other holders of first liens could deposit their securities at any time up to the day of the court's confirmation of the sale.

The receivers are said to have more than $4,500,000 in their treasury, invested in government bonds. It is said that Mr. Harding will report the presence of these funds to Judge Stone at the time he reports the bid of $8,000,000 for the court's confirmation.

Mr. Groner is attorney for the Newman-Woolfolk interests. He is quoted as saying that the cash left in the company's treasury will be utilized for improvements.

Significant Tax Suit

Discrimination Charged by Akron Company—Uniformity Sought in Method of Assessment—Temporary Injunction Served

COUNTY treasurers of Summit, Stark, Portage, Medina, Tuscarawas, Cuyahoga, Wayne and Noble Counties—all the counties through which the Northern Ohio Traction & Light Company operates—have been served with a temporary order from the federal court of the northern district of Ohio restraining them from collecting taxes assessed against the company for 1925. The company's taxes are fixed by the state commission. The temporary order follows the filing of a suit by the company against the counties named to secure a reduction in taxes. The contention is that the property of the company is not assessed upon the same basis as other property in Ohio. The suit is the first of its kind brought by a public utility in Ohio and probably the United States.

The company declares that, because real estate valuations in general are too low, it is forced to pay taxes proportionately too high. Prior to March 1, 1925, the company filed with the Tax Commission its verified annual report as prescribed by the commission and that the commission placed a tentative value of $27,061,180 upon the property. The company applied for a hearing before the commission, but could get no reduction. The apportionment was made and taxes aggregating $750,000 were assessed.

The company says:

For many years there has been in the respective counties a systematic general undervaluation of real estate for the purpose of taxation; that in the years 1924 and 1925 the average tax valuation of real estate in said counties would not exceed 45 per cent of the true valuation of said real estate; that there has been no reappraisal of real estate in many of said counties for many years, during which time the aggregate value of real estate in said counties has enormously increased; that the Board of Commissioners of said respective counties and the State Tax Commission have refused and neglected to increase and readjust the assessments of said property on the tax duplicates of said counties or to cause a proper reappraisement to be made thereof, although being fully advised of the undervaluation and inequalities as aforesaid, but have knowingly and systematically permitted said condition to continue and grow worse from year to year; that as a result of the failure of said taxing boards to adopt and follow a uniform rule in assessing the property of the plaintiff and other property in said state and said counties, and the systematic and general undervaluation of other property in said counties, the tax rate in said respective counties for the year 1925 is much higher than would have been required to produce the same revenue if the real estate therein had been assessed at its true valuation in money as required by law, and this plaintiff has been discriminated against, is denied the equal protection of the laws and is about to be deprived of its property without due process of law, in violation of the Fourteenth Amendment to the Constitution of the United States and in violation of the Constitution and laws of the State of Ohio, providing that property should be taxed at its true value in money by a uniform rule.

The company says further:

The said several defendants, as county treasurers, are each severally demanding the payment of the whole tax shown by each county tax duplicate, the first half of which was due Dec. 20, 1925, and are intending and threatening to enforce and will enforce the collection of the whole amount of tax shown by said tax duplicates respectively, including the amount unlawfully assessed as well as the amount lawfully due, and to impose penalties upon the plaintiff upon the amount of tax assessed, and to sell plaintiff's property at tax sale, or else to distrain plaintiff's property therefor, to the great and irreparable injury of the plaintiff, and the plaintiff will be subjected to a multiplicity of vexatious suits and prosecutions, and also subjected to an illegal lien and a cloud upon the title to its property within the state.

The company says that it is ready and willing to pay the tax levied against it in the amount which would have been assessed against it if its property had been assessed by a uniform rule along with other taxable property, and that, on ascertainment by the court of the true amounts of tax lawfully due from it in each county, it offers to pay any such lawful tax as a condition of its relief in the premises.

A. C. Blinn, vice-president and general manager of the company, says that the company has no desire or inclination to evade its just share of the tax burden. The law of Ohio provides that all property shall be taxed by a uniform rule, and it is the contention of the company, Mr. Blinn says, that the Tax Commission of Ohio does not tax its property by the same method and on the same basis as other property is taxed.

$304,704 Refunded by Pittsburgh Receivers

The final report of C. A. Fagan, S. L. Tone and W. G. George, former receivers for the Pittsburgh Railways, Pittsburgh, Pa., subsidiary of the Philadelphia Company, has been filed in the federal court, showing a balance of $304,704 to be refunded to the company. The receivership was lifted on Jan. 30, 1924. The court at that time ordered that $500,000 be left in the control of the receivers to satisfy outstanding claims.

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Merger in Williamsport

Four traction companies operating over the streets in Williamsport, Pa., and vicinity will be merged to form the Williamsport Railways following the passing of an ordinance by the City Council providing for such amalgamation. Traction company problems have been before the City Council for the past six months and the Mayor some time ago named a committee of citizens to make a report. This amalgamation follows the report. The companies merged are the Vallamont Traction Company, East End Passenger Railway, South Side Passenger Railway and the Williamsport Passenger Railway.

The final details of the merger will not be consummated for at least two months due to legal acts necessary. A straight 10-cent fare will be asked effective within 30 days. The new company plans to modernize the system.

Mount Manitou Road Not Sold.—The Mount Manitou Park & Incline Railway, Colorado Springs, Col., has not been sold at sheriff's sale, as reported in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 8, page 233, nor should it have been included in the receivership table in the issue of Jan. 2, 1926, page 43. The road is a success financially.

Car Trusts of Gary Railways Offered.—An issue of $350,000 of 5½ per cent equipment trust certificates of the Gary Railways, Gary, Ind., is being offered by Halsey, Stuart & Company, New York. The notes, which are issued under the Philadelphia plan, are priced to yield from 5.50 per cent to 6 per cent, according to maturities.

Worcester Board Increased.—W. E. McGregor of Harris, Forbes & Company, New York, bankers, has been elected a director of the Worcester Consolidated Street Railway, Worcester, Mass. His election increased the board to nine members.

Seeks Abandonment Permission.—The Depew & Lancaster Railway Corporation, connecting Cheektowaga, Depew and Lancaster, applied on Dec. 28 to the Public Service Commission for approval of a declaration of abandonment. The company alleges that the road has operated at a loss ever since it was placed in operation in 1921 and that the deficit incurred in such operation now amounts to approximately $60,000; that up to Sept. 30, 1925, unpaid interest accrued on a first mortgage bond issue of $110,000, amounting to $27,625. The stockholders and directors of the company on Dec. 28 voted to take the necessary steps to abandon the 12-mile road.

$6,000,000 Illinois Power Issue Offered.—The Illinois Power & Light Corporation, Chicago, Ill., on Dec. 29 placed with the investing public an issue of $6,000,000 of first and refunding mortgage 5½ per cent gold bonds, series B, due in 1954. The bonds were offered by E. H. Rollins & Sons, Harris, Forbes & Company, Halsey, Stuart & Company, Inc., Spencer Trask & Company, Marshall Field, Glore, Ward & Company, and Blyth, Witter & Company, at a price of 99 and interest, to yield over 5.50 per cent. Proceeds of the bond issue are to be used to reimburse the company for extensions and betterments and to retire $2,596,800 of the underlying bonds.

Interstate to Issue Securities.—Following a conference of members of the Indiana Public Service Commission and officers of the Interstate Public Service Company, Indianapolis, Ind., it was learned the company soon will ask the commission for authority to sell securities of approximately $1,000,000 to $1,500,000 to provide the company with more working capital.

Wisconsin Bonds Offered. — Hill, Joiner & Company, Halsey, Stuart & Company, Inc., and Paine, Webber & Company are offering at 98½ and interest to yield about 5.60 per cent $1,200,000 first lien and refunding mortgage 5½ per cent gold bonds of the Wisconsin Power & Light Company, Oshkosh, Wis., known as Series D. The bonds are dated Dec. 1, 1925, and are due Dec. 1, 1955. The proceeds will be used for additional property required, for expenditures made and to be made for additions and for other corporate purposes.

Legal Notes

CALIFORNIA—*Use of Highways by Private Carriers under Jurisdiction of Legislature.*

A truck company had entered into a purported lease with an orange growers' association to supply certain trucks to be used in the transportation of fruit, but the trucks were to be operated by the truck company. This was held to bring the trucks so operated under the Auto Stage and Transportation Act which covered the use of buses, auto trucks, etc., "in the business of transportation of persons or property for compensation," as well as common carriers. The act mentioned forbids the use of public highways to any such carrier, except under certain conditions, one of which is that it must obtain from the Railroad Commission a certificate of convenience and necessity. Another clause empowers the commission to fix rates for such service. It was held that the Legislature could not transform the private carrier to a common carrier, but that the act did not do this. The privilege of using the public highways as a place for the transaction of business is not a vested right, but a privilege which the state may grant or withhold at its pleasure, and if it grants this permission, it may do so upon such terms and conditions as it may see fit to impose. A distinction was drawn between the case at court and that of Michigan Public Utilities Commission v. Duke, in that in the latter case, Duke was operating under contract existing before and at the time of the enactment of the Michigan statute, whereas in the case at court, the contract was not made until after the passage of the California statute. The truck company was not obliged to submit to the conditions imposed by it, but if it used the public highways, it should be deemed to have thereby consented to the conditions prescribed by the Legislature. [Frost et al. vs. Railroad Commission of California et al., 240 Pacific Rep., 26.]

KENTUCKY—*Degree of Ability to Stop Car defined.*

Expert evidence as to the distance within which an electric car could have been stopped is insufficient to contradict the established physical fact that the car did not stop within such distance, in view of the evidence as to what was done to stop it. The company is not necessarily liable for damages if the motorman failed in some degree to exercise the utmost care possible by immediately comprehending the whole situation when a person is in peril and loses not a second in the performance of every duty imposed upon him by the sudden emergency. Such presence of mind and efficiency are not possessed by ordinary men, nor available to the defendant; hence, the plaintiff is not entitled to protection in that extreme degree. [Kentucky Traction & Terminal Co. vs. Brackett, 276 Southwest. Rep., 828.]

MISSOURI—*Neglect in Allowing a Ground to Remain on a Transmission Pole Makes Company Liable for Injury to Lineman.*

Attached to a pole carrying high-voltage wires was a guy wire used to maintain in position the smokestack of a neighboring building. The guy wire was attached to the pole with the consent of the railway company. A lineman, not knowing this guy wire was grounded, stood on it while altering the transmission wires and received a fatal shock. The railway company, the owners of the stack, and the contractor for its erection were held jointly responsible. [Smith vs. St. Joseph R. L. H. & P. Co., 276 Southwest. Rep., 607.]

TEXAS—*Carrier Owes Duty to Passenger to See that Aisle Is Not Obstructed When Passenger Is Alighting from Car.*

A woman passenger on a crowded one-man car was injured while going to the front of a car to alight by stumbling over a suitcase left in the aisle by another passenger. The court held that the high degree of care which a carrier owes to its passengers may in law include the duty to see that the aisle of its car is not obstructed by a large suitcase over which a passenger is likely to stumble and fall, especially at the time when the car is stopped for this passenger to alight. In consequence, the issue of negligence in this case should have been submitted to the jury. The court said that the negligence alleged does not depend on knowledge of the presence of the obstruction, but on failure to use care to prevent the obstruction being placed in the aisle. [Houston Electric Co. vs. Bagg, 276 Southwest. Rep., 641.]

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Personal Items

Messrs. Sawyer and Eales Go Abroad

First Vice-President of American Electric Railway Association Chosen to Report to Australian Government

Two American engineers, W. H. Sawyer, East St. Louis, and H. W. Eales, St. Louis, both of whom occupy prominent places in the electrical industry of the United States, will sail for Australia on Feb. 2 to make a survey of electric power resources in the Antipodes. Announcement to this effect

W. H. Sawyer

was made on Jan. 6 by Sir James Elder, Commissioner for Australia in the United States of America.

Officially Messrs. Sawyer and Eales have been appointed by the government of the State of Victoria, through the Prime Minister's Department of the Commonwealth of Australia, to "investigate and report on the Yallourn brown coal electricity generation scheme and connected power undertakings of the government electricity commission." Actually, however, these men have been summoned to Australia to place the benefit of America's electrical experience at the disposal of a country which aspires to change from a mere producer of raw materials to a completely self-contained nation, a nation quite capable of supporting itself.

Mr. Sawyer, an executive engineer, is president of the East St. Louis & Suburban Railway Company, East St. Louis, Ill., and an officer of other properties controlled by the North American Company and is first vice-president of the American Electric Railway Association. Mr. Eales, who goes to Australia as his assistant, is a regional vice-president in the American Institute of Electrical Engineers and is active in National Electric Light Association work. Both Mr. Sawyer and Mr. Eales are undertaking the mission to Australia on extended leaves of absence from their duties in the North American system.

With an area almost as large as the United States, with a population of nearly 6,000,000, and with natural resources so abundant and so varied that it produces all essentials of an economic independence, Australia finds itself chiefly engaged in producing raw materials for other countries to manufacture into finished products. What Australia needs is development of its electric power resources so that it can manufacture the materials which it produces. Because the government there believes that the United States is far ahead of other nations in backing up its man-power with motive power, it came to America for the men best qualified to tell it how to develop electric plants and how to use them.

The chief problem faced by Australia and by the two American electrical experts is how to make efficient use for electric generation of enormous quantities of "brown coal," a low-grade fuel of somewhat lesser quality than the American lignite. This coal contains from 60 to 65 per cent moisture, and if means are found whereby it can be dried out for use in steam-electric generation a great stride will be accomplished toward providing Australia with an abundance of cheap electricity.

The Victorian Electricity Commission has already spent more than $30,000,000 in generating plants and distribution system, and before embarking upon a wider field to stimulate the use of electricity it desired the best information obtainable, with recommendations for future development. It is generally understood that in selecting American engineers for this work the government not only appreciated the advances made by the American electrical industry but desired the appointments to be regarded as an international compliment to the United States.

W. A. Seten Commercial Manager at Wheeling

W. A. Seten, Pittsburgh, has been appointed commercial manager of the Wheeling Traction Company, Wheeling, W. Va. He will succeed J. E. Alberts, former assistant general manager, who recently resigned to accept an offer from the Public Service Railway, Newark, N. J. This announcement was made by A. C. Spurr, general manager of the local company. Mr. Seten began his duties on Jan. 4. For the last few years he has been connected with the J. G. White Corporation, New York City. He has also been connected with the Manila Electric Company in the Philippine Islands in charge of the transportation department.

The commercial department, of which Mr. Seten will be manager, has been created by the Wheeling Traction Company in place of the assistant general managership. The duties of the office require that the head of the department concern himself with the quantity and the quality of the service, complaints from the general public and the advertising end of the railway business. He will also assist the general manager.

G. B. Powell Superintendent at Louisville—Other Changes

Changes in the personnel of its transportation department have been announced by the Louisville Railway, Louisville, Ky., incidental to the reorganization of the department following the death of Anthony F. Connelly after 50 years of service.

G. B. Powell has been appointed superintendent of transportation of the company. Mr. Powell was employed by the company from August, 1904, to September, 1906, as trainman; from September, 1906, to March, 1910, as carhouse foreman; from March, 1910, to February, 1920, as superintendent of

G. B. Powell

employment and schedules; from February, 1920, to December, 1925, as assistant general superintendent, and on Dec. 15, 1925, he was appointed to his present position of superintendent of transportation.

Albert E. Nelson has been appointed assistant superintendent of transportation. He was employed from October, 1910, to February, 1912, as trainman; from February, 1912, to January, 1920, as carhouse foreman; from January, 1920, to December, 1925, as transportation clerk, and on Dec. 15, 1925, he was appointed to his present position as assistant superintendent of transportation.

Ernest B. Ellingsworth has been appointed assistant superintendent of transportation. He was employed from August, 1898, to February, 1905, as trainman; from February, 1905, to December, 1925, as carhouse foreman, and on Dec. 15, 1925, he was appointed to his present position as assistant superintendent.

B. H. Williams has been appointed chief inspector. He was employed from August, 1887, to January, 1890, as trainman; from January, 1890, to June, 1907, as carhouse foreman; from June, 1907, to December, 1925, as inspector, and on Dec. 15, 1925, he was appointed to his present position as chief inspector.

Frank Raschig, who has been executive secretary and principal assistant engineer of the Cincinnati Rapid

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Transit Commission, Cincinnati, Ohio, has been appointed chief engineer of the commission to succeed Frank S. Krug, who resigned to practice for himself in the field of engineering.

Changes on B.-M. T.— James Addison Comptroller

James Addison was elected comptroller of the Brooklyn-Manhattan Transit System, Brooklyn, N. Y., to succeed the late Howard Abel at the meeting of the board of directors on Dec. 21, 1925.

A. P. Clausonthue will continue as assistant comptroller.

De Forest P. Rudd, who has been with the system for some years, was made an additional assistant comptroller.

Mr. Addison came to the United States from England in 1902 and for two years was associated with the accounting firm of Patterson, Teele & Dennis, New York. He then became auditor of the Eaton, Crane & Pike Company, Pittsfield, Mass., where he remained eight years. Mr. Addison next was appointed auditor of the Franklin Railway Supply Company and its affiliated organizations. This position he occupied until January, 1918, when he was elected comptroller of the National City Bank, New York. Mr. Addison remained with the National City Bank for five years. During the past few years he has been practising public accounting and recently he had been engaged on special work for Patterson, Teele & Dennis, the firm with which he was first associated after coming to the United States.

James Addison

The new comptroller was born in Leith, Scotland. He was educated at Edinburgh, attending Heriot Watt College and taking special courses at Edinburgh University to prepare himself for a business career. His training as an accountant was obtained in Edinburgh and also at New Castle-on-Tyne and Huddersfield, England. He is a vice-president of the Garden City Bank and a member of the American Institute of Accountants, the Garden City Country Club and Crescent Lodge, F. and A. M.

Frank S. Krug has resigned as chief engineer of the Cincinnati Rapid Transit Commission, Cincinnati, Ohio. Mr. Krug said that since only a few months more work was needed to place the line in operation he felt that his services were no longer needed. Mr. Krug also tendered his resignation as city engineer. Before being appointed city engineer he was secretary of the Frank H. Kirchner Construction Company. Prior to that he had been county engineer for a number of years. Mr. Krug plans to go into the private practice of engineering.

C. O. W. Weidman at Altoona— Other Changes

Claude O. Weidman, Newark, N. J., formerly superintendent of the Morris County Traction Company, Morristown, N. J., has assumed the duties as superintendent of transportation for the Altoona & Logan Valley Electric Railway, Altoona. He succeeds John R. Condo, resigned.

Mr. Weidman has served electric railways for more than twenty years. He began his work with the Southern New York Railway & Power Company and then went to Morristown, N. J., where he remained for eleven years.

G. S. W. Brubaker has taken the position as engineer of maintenance and construction at Altoona, succeeding Frank D. Hain, resigned.

Mr. Brubaker has been engaged in rebuilding work for many years with the American railways. He rebuilt the lines at Chester, Wilmington, Darby and other Eastern points.

John R. Condo, superintendent, who resigned, served the Logan Valley since 1917, succeeding Lee T. Shannon, now general manager of the Johnstown Traction Company.

Frank D. Hain, engineer, who resigned, served the company for twelve years, having a leave of absence for two years to serve as engineer for the city of Altoona.

H. D. Bercaw Akron Property's Southern Division Manager

Henry D. Bercaw, who has been claim agent of the Northern Ohio Traction & Light Company at Canton, Ohio, for the last five years, has been appointed manager of the Canton and Massillon systems of the company as well as the company's interurban lines south of Akron. He is given full authority to handle all company matters, both city and interurban, pertaining to the Southern Division. Mr. Bercaw assumed his new duties Jan. 1. He has been with the company seven years.

In announcing the appointment, A. C. Blinn, vice-president and general manager of the entire property, said that the company had felt for some time that the industrial and commercial development of Canton demanded a local resident manager. "Canton has witnessed a splendid and remarkable growth during the last few years," he said, "while many other cities were marking time. It is partly in recognition of this, and partly because the city's transportation needs development, that the company has selected Mr. Bercaw as manager."

Mr. Bercaw has a large following among those interested in civic affairs.

H. L. Andrews Advanced by General Electric

H. L. Andrews has recently been appointed assistant engineer of the railway engineering department of the General Electric Company, in administrative charge of the department. For some time he has been in charge of car equipment work in that department. In this capacity he has been identified with all the large railway equipment propositions that have come up in the last few years and in that way has built up a wide acquaintance in the electric railway operating field, to the members of which his advancement will be pleasing. This position will enable Mr. Andrews to use to better advantage his boundless energies and executive ability under W. B. Potter, who for many years has been chief engineer of the railway department.

H. L. Andrews

Mr. Andrews was born in Boonville, Mo., in 1889. He was graduated from the University of Missouri in 1910 with the degree of B.S. in E.E. He entered the testing department of the General Electric Company, Schenectady Works, in August, 1910. In May, 1912, he was transferred to the railway motor department and four years later, 1916, to the railway engineering department, one year later being placed in charge of car equipment work.

Obituary

Dr. Karl Goldschmidt

Dr. Karl Goldschmidt, head of Th. Goldschmidt A. G. of Essen, Germany, died on Jan. 4. Dr. Goldschmidt was approaching his 70th year. He had long been prominent in the business and scientific world, both here and abroad, not only as the active head of Th. Goldschmidt A. G., but also on account of extensive chemical research and development work, particularly in connection with processes for the detinning of scrap tin plate, upon which subject he was regarded as a recognized authority.

In partnership with his younger brother, the late Prof. Hans Goldschmidt, inventor of the well-known thermit process, who died in the early

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part of 1923. Dr. Karl Goldschmidt carried on the enterprise founded by his father and brought it to its present dominant position among German industries. He was also one of the founders and original directors of the Goldschmidt Detinning Company, now the Metal & Thermit Corporation, New York City.

Endowed with rare vision and energy, Dr. Goldschmidt took an active interest in the welfare of his employees, being instrumental in the establishment of old age and invalid pensions from which workmen with more than ten years of service were entitled to relief. From his own means he also set aside a large sum for the establishment of a suitable home for those of his employees who after illness might need a quiet place at which to rest and recuperate. Dr. Goldschmidt's eldest son, Dr. Theodore Goldschmidt, succeeds his father as active head of the German firm.

John A. Rigg

John A. Rigg, president of the Interstate Railways, Camden, N. J., died on Jan. 2 at his apartment in the Longacre Hotel, Philadelphia. He was in his seventy-first year. Death was said to be due to apoplexy.

Mr. Rigg was born at Gibraltar, Berks County, Pa., on Feb. 14, 1854. At the age of fifteen he quit the farm and went to Reading, where he began his career as an iron puddler. Three years later he took a position with the local railway as a conductor. In 1874 he was promoted to superintendent, and continued in the service of the Reading City Passenger Railway until 1892, when he became the general manager of the People's Passenger Railway, Philadelphia.

In this latter connection Mr. Rigg gathered about him able business associates and organized the Reading Traction Company, which leased and consolidated the street railways of Reading, also the Metropolitan Electric Company, which manages the Reading Electric Light, Heat & Power Company, and the Neversink Electric Light, Heat & Power Company, controlling the electric lighting business of Reading.

Mr. Rigg was also instrumental in forming the United Power & Transportation Company, most of the stock of which is controlled by the Interstate Railways. He was an officer and director of subsidiaries of both of these companies, among them the Trenton Street Railway, operated under lease by the Trenton & Mercer County Traction Corporation; the Delaware County & Philadelphia Electric Railway, the Media, Glen Riddle & Richdale Electric Railway, the Wilkesbarre & Wyoming Valley Traction Company, which is leased to the Wilkesbarre Railway, and the Wilmington & Chester Traction.

B. H. Ryder of the American Steel & Wire Company died on Dec. 26. He went with the American Steel & Wire Company more than twenty years ago, entering the electric wire and cable department. With the exception of a short connection with the Pittsburgh office of the company about seven years ago, his activities were carried on almost entirely in the West, with Chicago as his headquarters.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Striking Comment by Victor Angerer

Prominent Manufacturer Sounds Keynote in Question of Parts Manufacture by Railways

Out of the turmoil of discussion which centers about the question of parts manufacture by operating companies may come a definite understanding as to the presence or absence of economies involved in this practice. For the time, however, opinion continues divided, although the weight of numbers seems to be considerably against the practice. Established manufacturers of electric railway equipment might naturally be expected to view the matter from the point of its possible effect upon them, nevertheless some very illuminating comments frequently are obtained from this quarter.

An example of this appears in a recent communication received from Victor Angerer, vice-president William Wharton, Jr. & Company, Inc., Easton, Pa. Mr. Angerer feels very keenly on the subject and has given considerable thought to the various aspects of the problem. While the William Wharton Company, because of the highly specialized nature of its product, is probably less affected than other manufacturers by this recently evidenced tendency on the part of some operating companies, nevertheless Mr. Angerer is much interested in the principle involved.

He mentioned the present discussion concerning the growth of this practice among steam railroads, particularly a number of addresses given at the recent annual meeting of the Railway Business Association on the subject. He then asked if the criticism advanced concerning the mutual relations co-operation between manufacturers and railroads in this field were not also applicable to the electric railway field. He went on to say:

> Hasn't the period of retrenchment and repairs, instead of renewal of equipment, etc., led a number of operating companies to extend the work of their auxiliary shops into what can be done better and more economically by and purchased from the specially equipped manufacturer? From what we know, this practice or tendency of the railroad and the railway doing some manufacturing of their own material requirements has affected nearly all lines of supplies to the railroads and the railway lines. Is there any true economy in this to the operating companies?

It is of course well known that the larger manufacturers annually expend much money in research and in developing new materials for railway use. Naturally this policy is not followed purely from a spirit of philanthropy. The manufacturers expect a fair return on this investment from sales of materials thus developed. Operating companies quite obviously cannot afford to expend a great deal of capital in this direction, and if the manufacturer is discouraged from continuing his research program because of what he considers unwarranted competition on the part of his erstwhile customers the industry as a whole is bound to suffer.

Matter Should Be Threshed Out

Mr. Angerer states his hope that the whole subject will be carefully studied and threshed out between the managers of the operating companies and the manufacturers of the various lines of supplies and equipment. He looks for a greater degree of co-operation between the parties involved.

As for the outlook for special trackwork in the future, Mr. Angerer says:

> We manufacturers appreciate the conditions which compelled the electric railways to disregard ultimate economy and follow a policy of restricting the immediate outlay of money by making all possible temporary repairs instead of the purchasing of new materials. The improved condition of the electric railways, however, gives us hope for the future—we might say the immediate future. It is, of course, only natural that expenditures for improvements are directed first to the cars and other equipment and that track comes last. While, therefore, manufacturers of such other equipment have already felt the greater activities, special trackwork manufacturers still are looking to the future.

In speaking of competition between traction companies and independent bus lines, he says:

> The bus does not scare us. Maybe it will help by hastening the necessary improvements in the condition of the track of the railway lines and the betterment of the high-class cars and to satisfy the public, who believe that they see some advantages in the comfortable seats and rubber-tired wheels of the bus, but who, we are assured, would not want to be without the railway lines and could not be without them.

Mr. Angerer realizes that the railway manager must heed the demand for his customers, the public, for better cars, more cars, smoother riding and less noise in operation. To satisfy these demands and at the same time preserve the new rolling stock, higher degree of maintenance of the track must necessarily follow. Ultimate economy in the maintenance should also call for renewals of the worn special trackwork in preference to frequent temporary repairs. All these factors together make the manufacturers opti-

Metal, Coal and Material Prices

Metals—New York	Jan. 5, 1926
Copper, electrolytic, cents per lb	14.125
Copper wire base, cents per lb	16.00
Lead, cents per lb	9.25
Zinc, cents per lb	8.90
Tin, Straits, cents per lb	63.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.625
Somerset mine run, Boston, net tons	2.10
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N. Y., cents per lb	18.25
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., per gal	0.225
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1550
Turpentine (bbl. lots), N. Y., per gal	$1.125

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mistic regarding the coming business in the line of special trackwork, he added.

Officers for American Car & Foundry Motors Announced

The American Car & Foundry Motors Company, which was recently organized to take over control of the Hall-Scott Motor Car Company, Berkeley, Cal., and Fageol Motors Company, Kent, Ohio, on Jan. 6 announced that W. H. Woodin had been named chairman of the board of directors and C. S. Sale president.

Col. E. J. Hall, one of the co-designers of the Liberty airplane engine, was made a vice-president, together with Horace Hager, L. Stancliffe, G. R. Scanlan and F. R. Fageol. H. C. Wick is secretary and S. A. Mallette treasurer.

The J. G. Brill Company, Philadelphia, builder of electric railway cars, through its interest in the Hall-Scott and Fageol companies, is represented on the board of directors by S. M. Curwen, its president.

Successor to Kelly-Springfield to Build Buses

Sale of the plant, equipment and material on hand of the Kelly-Springfield Truck Company to the American Bus & Truck Company, a Delaware corporation, has been confirmed by Judge Frank M. Krapp of Common Pleas Court, by whose orders the receiver of the Kelly company, Pearl A. Lewis, offered the property for sale. The new owners plan to expand the activities of the corporation. Edward L. White, New York, representing the American company, will remain in Springfield to assume charge of the plant. He said the company will add a line of buses to be manufactured under foreign patents and that these will all be produced at the Springfield plant. The Kelly-Springfield company did not manufacture buses, but it frequently provided chassis on special bus orders.

W. J. Overman With Fageol—D. P. Knight Succeeds Him

W. J. Overman has resigned as engineer of the railway, department of the Boston office General Electric Company to accept a position with the Fageol Company, 120 Broadway, New York, builder of buses. Mr. Overman will specialize in the application of the electric drive in his new work. He was graduated from the Virginia Polytechnic Institute and has been with the General Electric Company for fifteen years, including service on the test and at the Schenectady works for eight years.

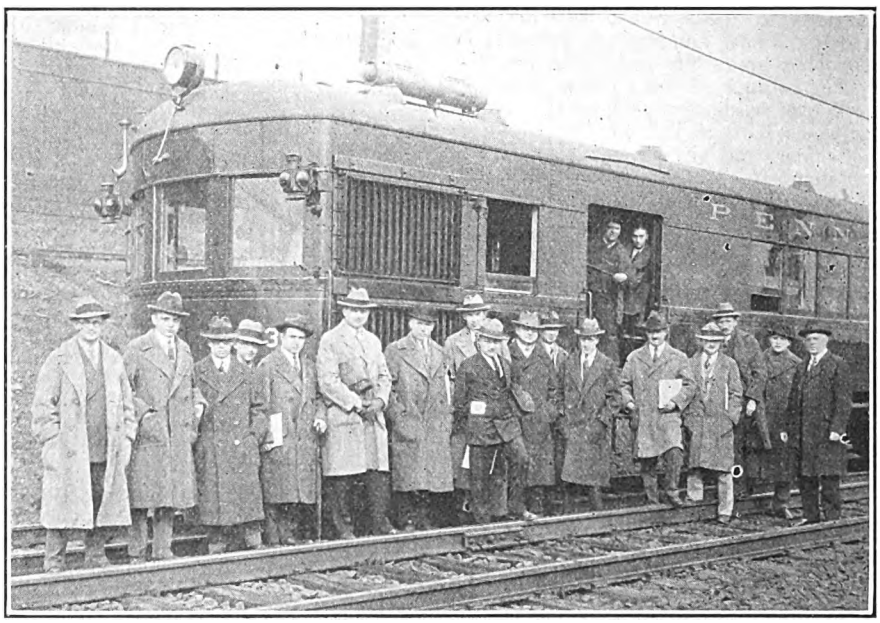
Donald P. Knight has become associated with the Boston office of the General Electric Company as engineer for the railway department. He was graduated from the Massachusetts Institute of Technology three years ago and has since been engaged on the Schenectady test and in railway motor work.

More Gas-Electric Cars

New Haven Railroad Orders Five of Type Demonstrated Recently by Brill and Westinghouse

An interesting demonstration of the recently developed Brill-Westinghouse gasoline-electric rail car was made on Jan. 5 over some of the lines of the Pennsylvania Railroad near Philadelphia. The particular car used was of 250 hp., and was one of the three units of this type delivered to the Pennsylvania Railroad this week for use in Indiana.

It is worthy of note that an order for five of these cars has just been placed with the J. G. Brill Company, Philadelphia, and the Westinghouse Electric & Manufacturing Company, by the New York, New Haven & Hartford Railroad. This brings the total number of units sold or contracted for to twenty. During the demonstration run a distance of approximately 60 miles was covered by the car, with its load of railroad and manufacturing officials, newspaper men and representatives of trade journals. Particularly noticeable as operating characteristics of this new equipment were the smoothness of operation and acceleration and the facility with which the car could be handled. Noticeable, too, was the attention which had been paid to the item of comfort in equipping this car for passenger service.



Guests of Brill and Westinghouse Companies at Demonstration of Gas-Electric Car

Upon the completion of the demonstration run in the morning, members of the party were driven to the Benjamin Franklin Hotel where a very tasteful luncheon was served. However, even without this additional courtesy those present were quite willing to vote the occasion a most interesting one.

Considering the fact that these gasoline-electric cars have only been placed on the market by the manufacturers for a short time—since last fall, in fact—the total of twenty cars sold is quite an imposing one and speaks well for the impression which the units are creating. The New Haven order of five cars is the largest thus far made. Three cars each have been ordered by the Erie Railroad, the Boston & Maine, the New York, Ontario & Western Railway, and the Pennsylvania Railroad. The Reading Company, the American Car Company, and the Great Northern Railway each have single cars which are being used for trial and demonstration purposes.

Seats for 61 passengers and 90 sq.ft. of baggage space are provided with a standard arrangement. The car is 60 ft. in length, and weighs complete with M. C. B. standard trucks and equipment 90,000 lb. The power plant consists of one six-cylinder, 7¼-in. bore by 8-in. stroke gasoline engine which delivers 250 hp. at 1,100 r.p.m. This is direct connected in turn with a 160-kw. 600-volt railway-type generator, which provides current for two 140-hp. railway-type motors. These are mounted on the front truck.

Keystone Company Is Absorbed by McGraw-Hill

Purchase of the Keystone Consolidated Publishing Company of Pittsburgh, Pa., by McGraw-Hill Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, has been announced. The latter company thereby acquired the two Keystone mining catalogs, the coal catalogs, mining and quarrying directories and the list services published and conducted by the Keystone company.

There is thus brought into one organization the outstanding publishing interests serving the mining field. McGraw-Hill company with its magazines, *Coal Age* and *Engineering & Mining Journal-Press*, and the Keystone company with its catalogs, directories and list. *Coal Age* and *Engineering & Mining Journal-Press* have served the mining industries for more than two generations, and the purchase of the Keystone property will enable them to broaden and intensify that service.

Joseph J. Vigneau, the founder of

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the Keystone Company, and until now its president, will continue in charge of the Keystone business for the McGraw-Hill Company with offices in Pittsburgh. Ralph C. Becker, hitherto vice-president of the Keystone Company, will continue in charge of the sales with headquarters in New York. Except for the retirement of Edward B. Day, New York representative, there will be no changes in the staff of the Keystone organization, but the service of the organization will be augmented by all the editorial and advertising resources and strength of the McGraw-Hill Company.

Progress in Stimulating Modernization

Progress is being made in the organization of the manufacturers' executive committee which will have general charge of the campaign to stimulate further development in car design and to bring about the replacement of obsolete equipment. Managing Director Storrs, who agreed at the last general meeting of car and equipment manufacturers to undertake the formation of this committee, has been giving the matter careful study. It is his plan to include in the personnel of the committee executives from leading manufacturers in the industry who will be in positions to speak authoritatively and to bring about general co-operation in executing plans that are formulated.

This committee will act as a clearing house to determine how the manufacturers can help the industry to modernize its equipment. A special sub-committee of experts, including J. A. Brooks of the J. G. Brill Company, C. A. Burleson of the General Electric Company and W. J. Clardy of the Westinghouse Electric & Manufacturing Company, which was organized on Dec. 14 under the chairmanship of G. C. Hecker, special engineer of the American Electric Railway Association, has been busy gathering information for its work. The services of these men have been donated by their respective companies. Their object will be primarily to gather information on the performance of modern electric railway cars and to stimulate further development and reduction in number of types and sizes of cars and equipment.

Material and information gathered by the committee will be given wide publicity in the industry. Many companies are preparing to co-operate in stimulating interest in car modernization by advertisements calling attention to the advantages of modern equipment.

480 New Cars and 75 Buses Needed at Detroit

The Department of Street Railways at Detroit, Mich., is now 150 cars short, will need 150 more cars for next year's business, should replace 180 cars now in use but considered unfit to run, and will need 75 more buses for the present routes. The cost of this equipment is estimated at $7,000,000. The needs of the department were outlined by Col. H. U. Wallace, general manager of the Department of Street Railways, in a talk at the annual dinner of the officials given on Dec. 28 by the governmental committee of the Detroit Board of Commerce.

In addition the need of new trackage was cited. It was stated that about $1,500,000 will have to be spent to replace worn-out physical equipment. Although much work has been done in the past three years to improve the physical condition of the property purchased from the Detroit United Railway it was cited that more work is necessary.

Rolling Stock

Boston Elevated Railway, Boston, Mass., has announced specifications on the 60 subway cars referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 19 and Dec. 26, 1925. The details:

Date order was placed	December, 1925
Date of delivery	March, 1927
Builder of car body	Osgood-Bradley Car Company
Type of car	Passenger subway
Seating capacity	72
Weights:	
Car body	Approximately 40,000 lb.
Trucks	Approximately 22,300 lb.
Equipment	Approximately 20,100 lb.
Total	Approximately 82,400 lb.
Bolster centers, length	51 ft. 0 in.
Length over all	69 ft. 2½ in.
Motor truck wheelbase	7 ft. 0 in.
Trailer truck wheelbase	6 ft. 0 in.
Width over all	9 ft. 6 in.
Body	All steel
Interior trim	Steel
Roof	Modified arch
Air brakes	Westinghouse
Axles	A. E. R. E. A. specification
Bumpers	Hedley anti-climbers
Car trimmings	Bronze
Center bearings	Truck builder
Side bearings	Stucki
Compressors	Westinghouse DH-25
Control	Westinghouse ALF
Couplers	Tomlinson-Ohio Brass Company
Door-operating mechanism	Electric
Gears and pinions	Westinghouse Electric & Manufacturing Company
Hand brakes	Vertical wheel, geared type
Heater equipment	Electric
Journal bearings	Plain
Journal boxes—Steel, 4½ in. x 8 in. trailer, 5 in. x 9 in. motor	
Lightning arresters	Westinghouse
Motors, type and number	Two Westinghouse 577-P-1, inside hung
Oilers (for 20 motors)	Rico wedge-key axle caps
Seats	Longitudinal, made by B. E. Rwy.
Seating material	Wood slats
Springs	Wason Manufacturing Company
Trucks	Wason Manufacturing Company
Ventilators	Perry
Wheels	Trailer 31-in. steel; motor, 34-in. steel

Seattle, Wash.—The City Council has passed Councilman W. T. Campbell's bill providing for a $1,800,000 issue of street railway utility bonds to finance purchase of 75 new street cars. D. W. Henderson, the superintendent, estimates that nearly $300,000 a year can be saved by replacing 75 of the old type heavy cars with cars of a lighter type and for one-man operation. The measure as passed bore little resemblance to the original measure. That provided for a bond issue of $3,500,000, of which $2,000,000 was for paving between tracks and for track extensions. The Council held that this would be a burden too great for the department.

Northern Ohio Traction & Light Company, Akron, Ohio, has ordered 25 freight trailers from the Kuhlman Car Company, built in accordance with the specifications agreed to by the C.E.R. Master Mechanics' Association.

Michigan Railroad, Jackson, Mich., is now buying fifteen freight trailers equipped with Westinghouse WC-12 air brakes and standardized C.E.R.A. diamond frame arch bar truck, with 33-in. steel wheels. The cars being purchased are in accordance with the standards as approved by the C.E.R. Master Mechanics' Association for freight trailers, with the exception that as the Michigan companies are hauling as high as twenty-car freight trains, it was considered advisable to specify the heavier type Tomlinson coupler, form 23, instead of the Tomlinson form 13, which has been standard on those properties.

Western Ohio Railway, Lima, Ohio, has placed an order with the Kuhlman Car Company of Cleveland, Ohio, for ten standardized freight trailers costing $3,100 each. The specifications are those recently adopted by the C.E.R. Master Mechanics' Association.

Track and Line

New York State Railways, Rochester, N. Y., renewed more than 5 miles of track and pavement in 1925. Tracks and new pavement were laid on the following streets: Monroe Avenue, 11,872 ft. of track; Blossom Road, 3,541 ft.; Mount Hope Avenue, 2,904 ft.; Goodman Street, 3,000 ft. Extraordinary repairs were made at the following locations, where the rail was renewed and the pavement replaced: Commercial Street, 311 ft.; Franklin Street, 1,420 ft.; Caledonia Avenue, 306 ft.; Bronson Avenue Bridge, 200 ft.; Central Avenue, 500 ft.; Saratoga Avenue, 700 ft. There were no extensions of track made during the year of 1925, and two crossovers were removed. During the year 4,000 ties were renewed with the corresponding number of bolts, plates and spikes and paving materials. Twenty-seven switches, nineteen mates and 41 frogs were renewed, as well as much guard rail in the special work layouts.

Spokane, Wash. — The Spokane & Eastern Railway & Power Company and the Spokane & Inland Empire Railway, interurban lines operated jointly out of Spokane, will expend about $160,000 in improving roadway and bridges during 1926. New bridges will be constructed in Palouse and Colfax, Wash., and considerable track reconstruction will be undertaken this year.

Trade Notes

Howell Van Blarcom has been appointed manager of the sales department of the Westinghouse Electric & Manufacturing Company at the South Philadelphia and Attica Works. R. E. Carothers has been appointed assistant manager. The large turbine sales section of the South Philadelphia Works will be conducted with A. H. Gamshird as manager. The small turbine section will be in charge of C. G. Ong, while P. L. Fetzer will be manager of the condenser section.

C. H. Lang, assistant manager of the publicity department of the General Electric Company, has become comptroller of budget for the company, a new position. Mr. Lang will pass upon the annual expense budget of the company and will report direct to the vice-presidents in charge of the several departments and to the comptroller.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Modern Maintenance Means Putting Equipment in Better than Original Condition

MANY things can be done as a part of the regular maintenance work on cars that will improve appearance and provide greater comfort and convenience for passengers. It is not enough when a car comes into the shop merely to have it put back as nearly as possible into its original condition. The master mechanic should have in mind that many improvements, developed perhaps since the car undergoing repair was built, are available and may be incorporated into the design.

An example of this is the modernization of car trucks practiced by the Lehigh Traction Company, as told in an article by James W. Brown in this issue. New parts have been used that give the trucks operating qualities comparable with those of most recent design. As to the cost of doing this, of course, there is some question as to whether there is real economy as compared with the use of entirely new trucks.

Many other details of car equipment can be improved so as to give more effective service at even less proportionate cost. Among these opportunities are reduction of step height; elimination of narrow, inconvenient doors and poorly placed stanchions and barriers; location of rails and hand straps; seats; destination signs; window shades, and floor coverings.

Some of these changes can be made at no additional cost if the work is carried on at a time when the car must be overhauled anyway and new parts installed for replacement. A study of the possibilities is sure to reveal many other ways in which the older car can be vastly improved and made more acceptable to the patrons.

Extensive remodeling of old equipment is not advocated, as there are many examples where the money used for such work could have been spent much more profitably in purchasing new equipment, but there is often room for improvement in cars that are of fairly recent date. Modern maintenance requires particular attention to appearance and convenience so that the bad features of old equipment will not be thrust continually upon the rider's attention.

Lowered Step Heights Possible on Some Existing Types of Equipment

STEP heights have been given particular attention in the design of the newest types of cars. Lower steps have come with reduced motor heights, and thus are a tribute to the electrical manufacturers. Some railways which have purchased new equipment have decreased wheel diameters on old cars correspondingly in order to reduce the number of sizes of wheels used. This has also reduced step heights.

Mechanical departments are loath to decrease the clearances between the roadbed and the bottoms of motor shells which are obtained with new small diameter wheels, as such a reduction necessitates increased attention in order to prevent trouble when wheels become worn. On a large number of roads it has been found that the clearances of one type of equipment are considerably less than for all others. There is no reason why the clearance should not be standardized at the minimum. This will simplify the inspection and it will have the further advantage that it will reduce the step height. The sizes of wheels used under old cars were seldom determined by the height and number of steps obtained and their effect on the traveling public. Today it is felt that the added attention required to operate small diameter wheels with small motor and gear clearance may be amply repaid by more satisfied riders.

Car Signs Should Clearly Give Definite Information

DESTINATION and route signs on cars should be made to serve a real purpose and attract additional patronage instead of diverting it to other channels. A regular patron of a particular car line pays little attention to the route and destination signs unless several different lines are routed by the particular point at which he boards the car. When he has to take an unfamiliar line the case is quite different. Then, too, the stranger in the city and the casual rider on a line expect route and destination signs to give clear, concise and intelligent information.

It is little wonder that a stranger pays ten to twenty times the price of car fare and takes a taxi in order to be rid of the inconvenience and annoyance of finding out if any of the particular cars he sees passing will take him somewhere near the point he wishes to reach. The railway will also be benefited much by having signs of such size and with a contrast in color so that they may be seen and read readily at a considerable distance. Lengths of stops are decreased if the passenger can get to the loading point before the car stops. It is unnecessary for the railway to buy new equipment to improve the sign conditions on its cars. Desirable changes can be made a part of the maintenance program.

Selection and installation of even the most excellent signs are insufficient in themselves. Deterioration is fairly rapid, particularly with the roller curtain type now so generally used. The writer recently boarded a car on which the destination sign was illegible at a distance of half a car length. Certainly a condition such as this does the company little good. Particular attention should be paid to the repainting and replacement of signs as frequently as is necessary to give clearly

This is the issue in January that is devoted essentially to maintenance subjects

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and legibly the information wanted by the patron, so that he can signal the right car without hesitation and without delaying other cars by unnecessary stops.

Arranging Car Colors to Give Streamline Effect

ONLY in comparatively recent designs of car bodies has particular attention been given to the elements of design that result in pleasing curves and streamlines. Many cars have vestibule windows and panels of doors out of line with the side windows. Where a distinct contrast in the color of the paint used for sash and the adjacent car body is used the lack of streamlines is made more pronounced.

Several railways are using a cream or light yellow color for the sides down to the lower edge of the belt rail, and an orange or red below this. By carrying the light color around underneath the end belt rails the dividing line of the two colors is made to line up so as to produce the desired streamline effect. A study and use of such painting effects as this is sure to result in added attractiveness for the cars and maintenance costs are affected but slightly.

A Continuous Supply of Coal Is of Vital Importance to Railways

FEW, if any, commodities affect the electric railway industry more than does coal. The fuel used in its power houses is but one factor; there is also the rise in the cost of metals that must result with increased coal prices, to say nothing of the demand for higher wage scales that follow increased living costs, by reason of the higher price of fuel. So while the present strike in the anthracite mines affects many of us personally, it should be of particular interest to us as railway men.

In regard to the nation's lack of authority to deal with the coal situation President Coolidge, in his recent message to Congress, said: "At the present time the national government has little or no authority to deal with this vital necessity of the life of the country. It has permitted itself to remain so powerless that its only attitude must be humble supplication." He suggests as a means of regulation that "authority should be lodged with the President and the Department of Commerce and Labor giving them the power to deal with an emergency."

This raises the question as to whether an emergency should ever exist or whether regulation should be applied to avoid the possibility of an emergency. There is in this country a great supply of coal ready to be mined. There is a supply of labor more than sufficient to mine it as fast as it is needed. Why then should an emergency occur? There is no doubt that an emergency exists. There is already a considerable use of makeshift fuel substitutes and there are rumors of large coal importations from Europe. The present controversy affects the anthracite mines particularly, but the anthracite industry affects the entire fuel industry as surely as a complete failure of car service would cause a stampede to other means of public transportation and the demoralization of their service. Emergencies are liable to occur in any business. But they have come to be expected regularly in the coal industry. When an emergency exists much of the damage is already done. Action should come before the emergency begins to avoid the kind of crisis we are now facing.

We are all tired of over-legislation. But when the coal industry assumes monopolistic aspects by having the miners arrayed solidly on one side and the operators lined up solidly on the other, yet both restricting the supply and forcing up the prices, there is need for a little direction from the outside.

An attempt to regulate a commodity like coal would not be without its difficulties. Among the complications would be the question of whether such control should be exercised by the state or the federal government. The many interstate transactions would almost require some phase of federal control. Perhaps the nearest to a parallel to this is the ruling of the United States Supreme Court that gas transmitted from one state to another to be sold at wholesale comes under the regulatory powers of Congress, but that gas transmitted from one state to another and distributed to various retail customers comes under the jurisdiction of the state. Such regulation need not be a strict fixing of prices, but rather should provide a means of insuring a continuous supply of coal, and the prices would take care of themselves through the channels of competitive trade. Among the things to be considered would be a fair basis for wages, which is largely the cause of the present controversy.

No doubt the coal operators, and the miners too, would violently oppose such regulation. Yet in time they would profit by the stability that would be given to this industry, just as public utilities have become so stabilized financially that their securities are looked upon by the careful investor almost as favorably as municipal bonds. Let's stop having coal emergencies.

A Statement that Carries Its Own Encomium

REJUVENATION is a word that is being bandied about a great deal in electric railway circles these days. There have been many notable cases of properties that have been revitalized, but none in its way is more significant than that of the Brooklyn Rapid Transit. The evil day of that road was Dec. 31, 1918. It was an evil day in the sense that it marked the road being placed in receivership, but it was not evil in the sense of the good that has since followed.

Of course, it would have been better, perhaps, if the necessity had not arisen for such action, but since it did, the court and the receiver, Lindley M. Garrison, proceeded to work out the salvation of the road. How well this has been done is shown now by the fact that the common stock of the successor, the Brooklyn-Manhattan Transit Company, has been placed on a dividend basis in less than a year and a half after reorganization. It is a new company in spirit, in hope and in outlook, in charge of a progressive personnel, largely the same as the old one.

In the last year and a half $8,500,000 has been spent for improvements and the directors have just authorized the expenditure of from $4,500,000 to $5,000,000 for the purchase of new cars. The company stands committed to the policy of being ready to deal with the city on the matter of additions to the rapid transit systems when the city is ready to deal with it. Under Hylan the officers were unable to get anywhere, but Chairman G. M. Dahl carried the fight to the ex-Mayor, much to the latter's discomfiture.

But that is done and gone. Just at this time two matters in connection with the affairs of the company

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are of particular interest. One is the fact that the company has been able to do so well and the other is the stress put by Mr. Dahl on the probable future trend of financing for the company. His statement to the stockholders, which was widely quoted, sets forth the need for a balanced financial structure along the lines suggested by the committee on finance of the American Electric Railway Association, and would seem to indicate that the hope for the future is to finance by issuing junior securities. Moreover, Mr. Dahl's statement brought out forcefully the wide distribution of the securities of the company, showing as it did that only 8 per cent of the preferred and common stock is owned by those holding more than 100 shares each. The average number of shares per stockholder is 96. Mr. Dahl said that it is not only in the interest of investors in the common stock that they should have a return on their investment, but that it is in the interest of the public and the city. Then he proceeded in direct language to point out why. This was an excellent piece of publicity. To the initiated very little explaining needs to be done about a statement of earnings that shows operating revenue of $18,636,971 for the five months ended Nov. 30, 1925, compared with $17,788,580 for the similar period in 1924 and nets of $2,514,802 and $2,093,314 for these comparable periods. The figures carry their own encomium.

Public Utility Operation on Plan of a Regulated Monopoly Not Completely Understood

CLARENCE K. CROSSAN voted "No" to the Philadelphia Rapid Transit plan to purchase taxis. He cast the lone negative vote of the ten members of the transportation committee of the Philadelphia City Council. Fortunately for the progressive plans of the P. R. T. there were nine affirmative votes and the measure has been approved for city co-operation in the taxi co-ordination plan.

The principle back of Mr. Crossan's logic is the deplorable feature of his reasoning. "There is no such thing as a good monopoly," Mr. Crossan is quoted as saying, and thus the philosophy of a bygone age was revived. To him "monopoly" and "trust" still call to mind the incongruous monster of the past. Fortunately, there appear to be fewer Crossans each year who fail to realize that a monopoly under public regulation is the most economical means of providing public service, and that a monopoly under regulation is in reality not a monopoly in the sense that it has a strong-arm control of the industry.

Only in recent years and often by means of expensive receiverships is the country getting rid of the duplication of capital expenditures occasioned by competitive building of railway lines years ago. In more recent times we have had the experience of the dual telephone system in many parts of our country, to the aggravation of the merchants and business houses that were required to make a double expenditure for telephone service.

Our present national administration is tending strongly toward consolidation of the country's railroads into balanced non-competitive groups, always under the regulation of the I. C. C. The regulatory body created and controlled by a just and a wise public service company law gives to the public the advantage of non-competitive service by private capital, and protection against unjust practices and abnormal profits.

Some Advantages of Foremen Conferences

GROWTH of interest in the training of foremen is an encouraging sign of the times in electric railway circles. If the facilities for educational work on electric railway properties are limited, they may profitably be concentrated on the supervisory force, at least at the start. Foremen are in intimate contact with the workmen on one hand and the management on the other. They have the point of view of the workman, because in general they have been promoted from the shop or track forces. As foremen they are part of the management, because they have been transferred from "work jobs" to "responsibility jobs."

Experience with foremen conferences in many industries has shown a keen desire for training in foremanship. Most of the men, of course, have been good workmen, but many have been promoted to the position without much insight into its duties, responsibilities and opportunities. Their very promotion showed that they possessed qualities of leadership. Such qualities need to be developed. Efforts made to develop them meet with response.

At its December meeting in Boston the New England Street Railway Club witnessed a demonstration of a foreman conference, conducted according to a plan which has proved successful in the conducting of such conferences generally. The interest of the club in this demonstration was so keen, and its appreciation of the possibilities of the plan so genuine, that the committee on education of the American Association, which was in session in Boston at the time, was reinforced in its determination to push this form of educational activity in 1926. This decision is a wise one. If the committee can get the foreman-training idea over to electric railway managements throughout the country, and if these managements will exert initiative in learning how foreman conferences should be conducted, there will be a noticeable advance in this industry along educational lines during the coming year. The committee cannot do it all. It must have co-operation. It has no axe to grind; only the good of the industry is behind its efforts. Give the foreman conference a fair trial this year.

Study of Car Appearance and Comfort a Desirable Move

MOST promising as a sign of the advent of a new era in electric railway history is the creation of a sub-committee at the recent meeting of the equipment committee to study means by which the comfort and appearance of electric cars may be improved. The subject is most timely. That the task was self-imposed augurs well for its success. Equipment men have been accused at times of being "stand-patters" and satisfied with things as they are, but the starting of this study shows a commendable progressive spirit and the industry at large should co-operate in every possible manner to help the committee produce some worth-while results.

Just how far reaching the work of this committee will be only time can tell. It is apparent, however, that there is a wide field of endeavor open which has had little previous exploration. This study should supplement the investigations and work of other committees, with the result that the composite will be of lasting benefit to the industry.

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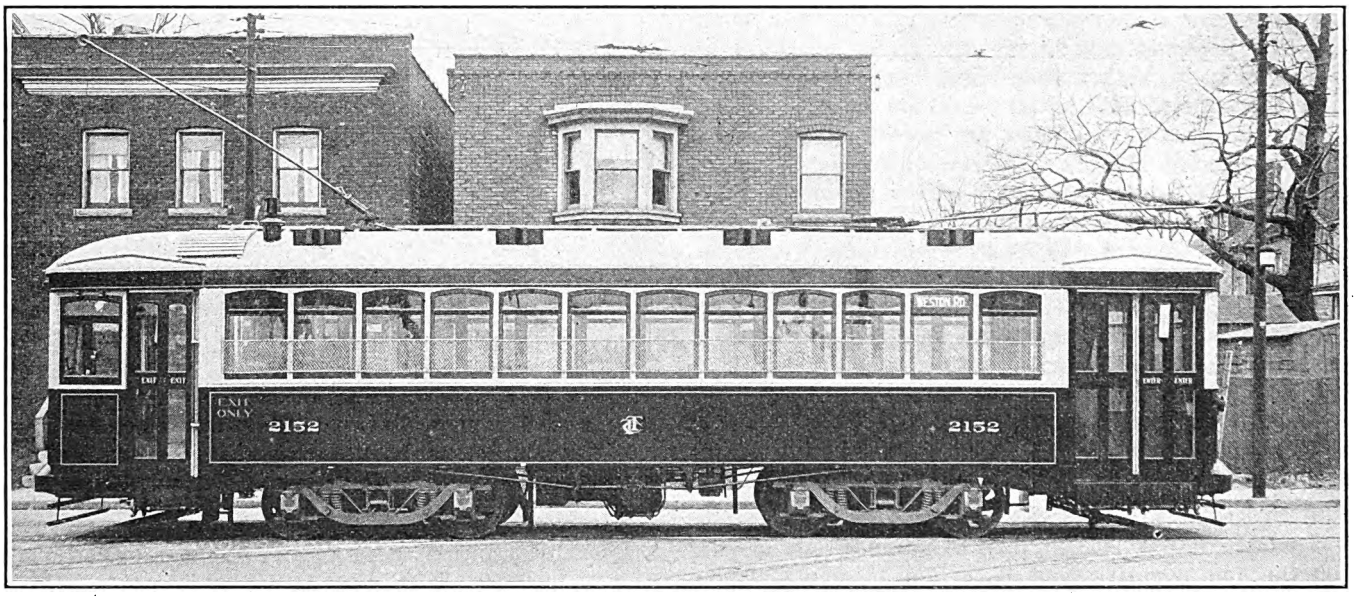
Unifying the Transportation Features of Toronto Rolling Stock

More than 300 Cars Taken Over by the Commission from Private Companies Have Been Remodeled for Front-Entrance Operation—One-Man Cars Have Been Equipped with Automatic Rear Exits—Lights and Mirrors Are Designed to Insure Safety of Passenger Movement



Front-Entrance, Automatic Rear-Exit Car as Remodeled by Toronto Transportation Commission from Rear-Entrance, Pay-as-You-Enter Car

WITH the assumption in 1921 of the control and operation by the Toronto Transportation Commission of the street railway systems of the Toronto Railway and the Toronto Civic Railway, one of the major problems was that of bringing to some uniform design the various types of car inherited from these two organizations. After a careful and extended investigation it was decided to adopt the front entrance as standard for the system. Standardization in this respect would avoid the confusion caused by differently located entrances, it was thought, and the universal front entrance was considered to be helpful in furthering the speedy operation of the system under the prevailing conditions. After this had been decided the commission procured new cars of the Peter Witt type, and now has 350 of these in service. With 225 two-door and three-door trailers for use in the rush hours they handle the traffic in the most heavily traveled routes. More than 300 of the older cars have been remodeled.

Cars taken over from the Toronto Railway numbered 832, of which 348 are now in service and the balance, numbering 484, composed of old-fashioned double-truck motor cars with semi-inclosed vestibules, and a varied assortment of single-truck motor cars and trailers with semi-inclosed and open vestibules, have been scrapped. Some of these cars dated back to 1892 or beyond.

Some 70 cars were taken over from the Toronto Civic Railway, and with the exception of 25 Birney safety cars and eight single-truck, double-end cars they were of the double-truck, double-end, pay-enter type. These cars were all of more modern design and in fairly good physical condition. All have been retained in service, but the double-truck, double-end, pay-enter type has been remodeled in a manner outlined below.

Of the 348 Toronto Railway cars retained in service, 215 have been or ultimately will be converted to the pay-leave design, as exemplified by the first car of the train shown in an accompanying illustration. One hundred have been rebuilt as one-man, single-end, front entrance and exit, rear treadle exit cars similar to the second car of the train. Ultimately the remaining 33 will be converted to motorized trailers for the six-motor trains.

In the pay-leave type the seating capacity has been increased considerably by extending the closed side longitudinal seats around the rear vestibule. The conductor's station is located at the rear end of the car body on the open side in a position to insure full control and safe operation of the exit door. A railing has also been installed, which, as is shown in an illustration, provides a considerable area of "prepaid accommodation." Because of its quick loading features this type of car is eminently suitable for handling the evening traffic peak when loading facilities are taxed to the utmost.

All cars rebuilt for pay-leave operation are similar in every respect in so far as the body, doors, conductor's location and seating arrangements are concerned. However, a group of 90 have been equipped with line and drum switches and automatic couplers, to enable

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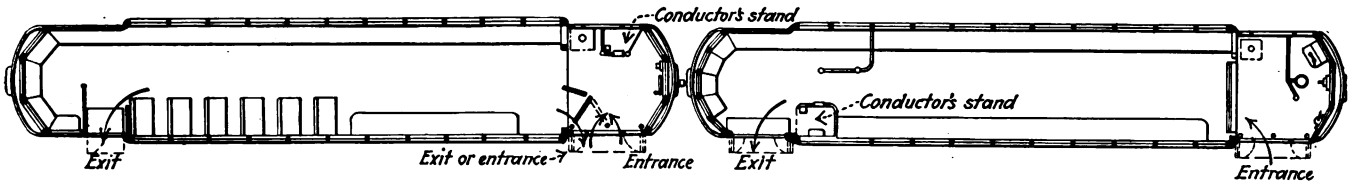
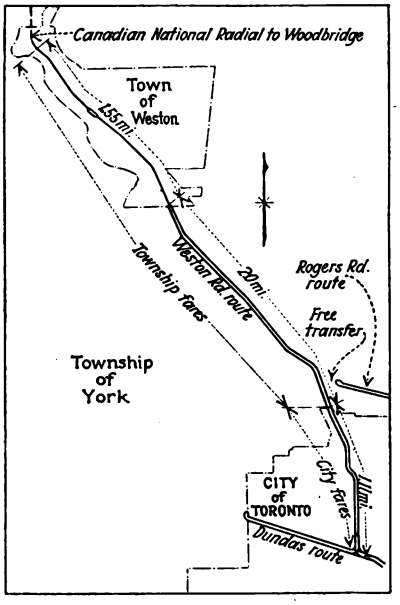


Entrance and Exit Arrangements on Cars Remodeled for Use in Six-Motor Trains. The First Car Seats 46 and the Second Car 48 Passengers

them to pull standard trailers. A second group of 33 will be equipped in a similar way in the near future to haul either a standard trailer or a motorized trailer. This will require the introduction of an additional drum switch to that required for standard trailer operation, and additional electric contacts on the coupler head. These drum switches are independently operated and designed to be foolproof, so that the operator, no matter what type of trailer he is picking up, must have the switches properly set to make the necessary connections for that particular type of equipment. If this is not done correctly, the line switch control circuit will remain open. The same applies when a car of this type is being operated as a single unit; if the drum switches are not thrown for unit car operation, the motors will remain inoperative. In the correct position for unit car operation, all the electric coupler contacts are dead, and similarly the exposed contacts are dead when hauling a standard trailer.



Separation of Township Fares and City Fares on This Route Necessitates Use of Two Fare Boxes

An auxiliary resistance also has been installed on this car for use only when running in a two-car six-motor train. This resistance is interlocked with the control, and is automatically cut out or in by the additional drum switch. Helical gears and pinions have been installed on the motors of these cars and the gear ratio altered to protect the equipment hauling trailer loads. This arrangement of the first car of the train makes it extremely flexible for various kinds of service. The third group, numbering 92, of this pay-leave design is equipped for unit car operation only and has no line switches.

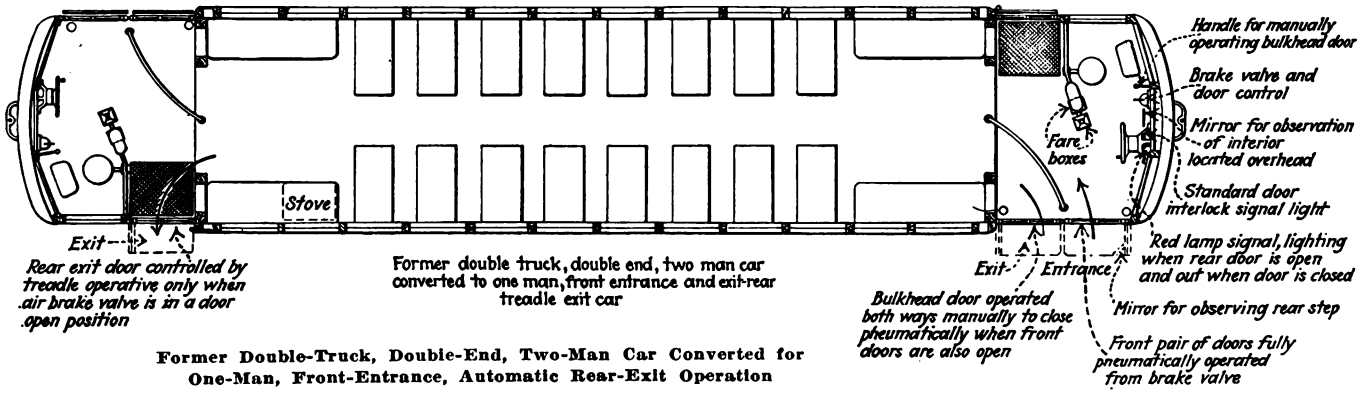
Birney cars were introduced originally in Toronto by the Civic Railway, and were successful if not routed on heavy traffic lines. After careful observation of conditions it was decided by the commission that the operation of one-man cars was a practical proposition, provided that larger cars could be operated safely, giving a much needed reserve of carrying capacity during the two acute daily traffic peaks. Reasonable frequency of service, it was also realized, would be economically impossible on many routes with the comparatively light off-peak traffic without one-man cars. Desire to make the service an attractive one made the management keen to evolve a satisfactory one-man car suitable for universal operation at all hours.

Evolution of the treadle-operated door paved the way for the elimination of all the principal objections previously apparent in one-man cars with front-entrance and exit doors only. Eventually the type of car shown in an accompanying illustration was devised, of which there are now 100 operating in Toronto. This group, with the previous three, accounts for 315 of the original pay-as-you-enter type taken over from the Toronto Railway.

Seats as rearranged accommodate 51 passengers as against 38 seats available in these cars previous to alteration. The width of the cars permitted cross seats to be placed only on one side, and the longitudinal seat on the closed side was continued around the rear vestibule.

This car is equipped with full safety control, with no foot valve, and a line switch which provides electric door interlock. The elimination of the foot valve was to compel the operator to carry out instructions and complete all major transactions with boarding passengers before starting the car. The front-entrance door has full pneumatic operation from the brake valve, and the bulkhead or exit half is operated both ways manually, but only after the forward door is open. National Pneumatic Company door and treadle equipment is used.

Closing the front door also pneumatically closes the exit door. This gives a measure of selective door control with one engine, without the use of a selector valve. Operation of the rear treadle door is initiated



Former Double-Truck, Double-End, Two-Man Car Converted for One-Man, Front-Entrance, Automatic Rear-Exit Operation

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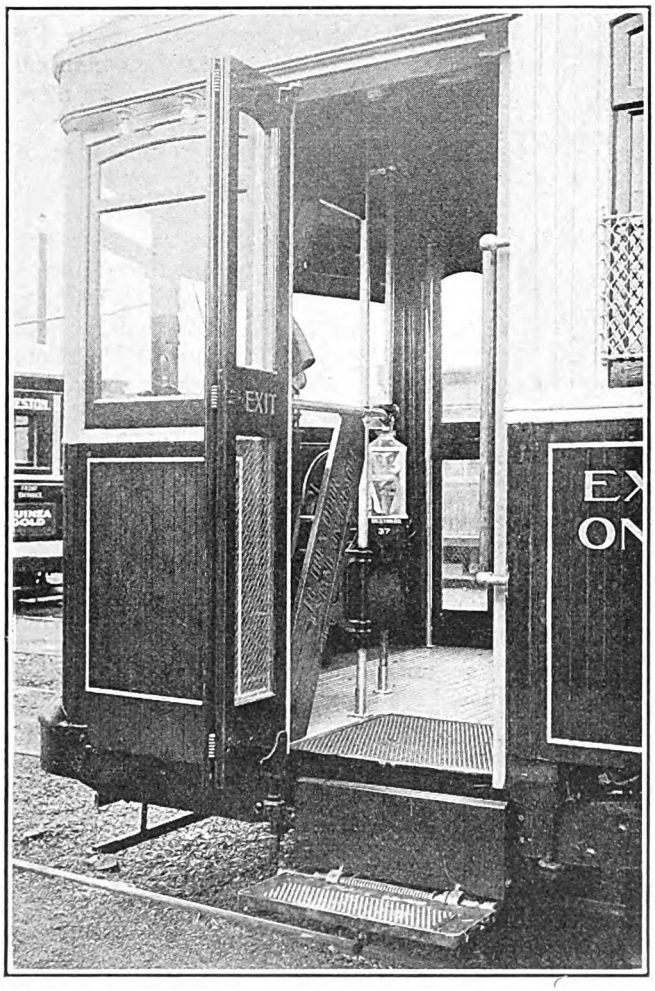
by the brake valve to an electro-magnetic valve, which, when a passenger stands on the treadle, completes the magnetic valve circuit, permits door opening pressure to enter the valve puller and this operates the door engine rotary valve. A second electro-magnetic valve in series with the other, with a ball check valve in the valve puller cylinder pipe, puts the closing of the door in control of the passengers alighting from the car.

On these cars an additional position has been given the M-28 brake valve by a minor alteration. This is ahead of the standard door-opening position. When the brake valve handle is moved to the new position it



Treadle and Step of Automatic Rear Exit on Toronto One-Man Cars

causes the rear treadle-operated door to become operative, the front door remaining closed. This arrangement permits of selective operation of the rear door.

In addition to the standard control signal lights, the operator has similar standard red lights which are illuminated so long as the rear treadle door is open. Five lights are also arranged on the rear vestibule to illuminate the treadle and step synchronously with the operator's red signal lights. Two of these are red and located outside the rear vestibule, giving warning to all vehicular traffic that the rear door is open and that passengers are about to alight. A mirror is mounted on the outside of the front-entrance door in such a manner that the operator sees plainly the rear-exit step and door when open. A second mirror is installed above the center window of the front vestibule directly in front of the operator to give an interior view of the car.

Such cars have been in service since November, 1924. Extension of the use of one-man cars in Toronto was facilitated by the adoption of the front entrance as standard on all cars of the system. Cars of this type now operate with capacity loads, partly or wholly over the same route with cars of other types, in some cases through the busy downtown area, without any confusion or doubt as to boarding location. Speed of loading, as was anticipated, is somewhat slower than with other types, but it is easily the speediest in unloading of any car operated in Toronto, and no trouble has been found in maintaining schedule speed. Where routes equipped with this car coincided with routes equipped with two-man cars, no interference has developed in maintaining the running time of other two-man cars.

Remaining Toronto Railway cars to be converted number 33. These will be operated as the second cars of the six-motor trains. This second car is front entrance and exit, with rear treadle exit, and, so far as seating arrangements and general layout are concerned, is similar to the one-man double-truck car type described. A movable barrier permits the conductor to use both doors at the front for entrance, as the traffic movement requires. This operation of the barrier materially assists in speeding up the loading and unloading of the car. This car is equipped with two motors of similar type and gear ratio to those used in the first car of the train. Both motors are installed in the forward truck. There is also a trolley pole, circuit breaker, reverser switch and resistor unit included in the equipment. When the car is coupled to the leading car the trolley pole is hooked down to the roof, the circuit breaker opened and the reverser switch set in forward position. When it is desired to move this type of car in yards or buildings, or to make up trains, the trolley pole is placed on the wire, the reverser switch is set in the desired direction of movement, and by means of the circuit breaker and staffless hand brake well controlled and safe movement is secured.

Control of both front doors and the rear treadle-operated exit door is from the conductor's station. The front door is equipped with a pneumatic door engine operated in the usual way by lever and rod to engine valve. The rear treadle exit door is operated by a switch of the push-button type, which, when in position for train movement, closes the train control circuit and opens the circuit in which is connected up the main electro-magnetic valve of the rear treadle exit door engine, keeping it inoperative while the train is in motion. When the train is at rest, and it is desired to have the rear exit door become operative, the door control switch is pushed to rear door operating position. This movement opens the train control circuit and connects the break in the main electro-magnetic valve circuit. Depression of the treadle completes the circuit and the exit door will open. An auxiliary electro-magnetic valve is installed in a manner to prevent the door from being slammed in the face of alighting passengers while there is weight on the treadle or step. This feature is independent in operation irrespective of any action of the conductor in pushing his control switch while passengers are alighting. This auxiliary valve application, however, is not effective on the valve puller cylinder until after the permissive switch movement is initiated by the conductor in charge.

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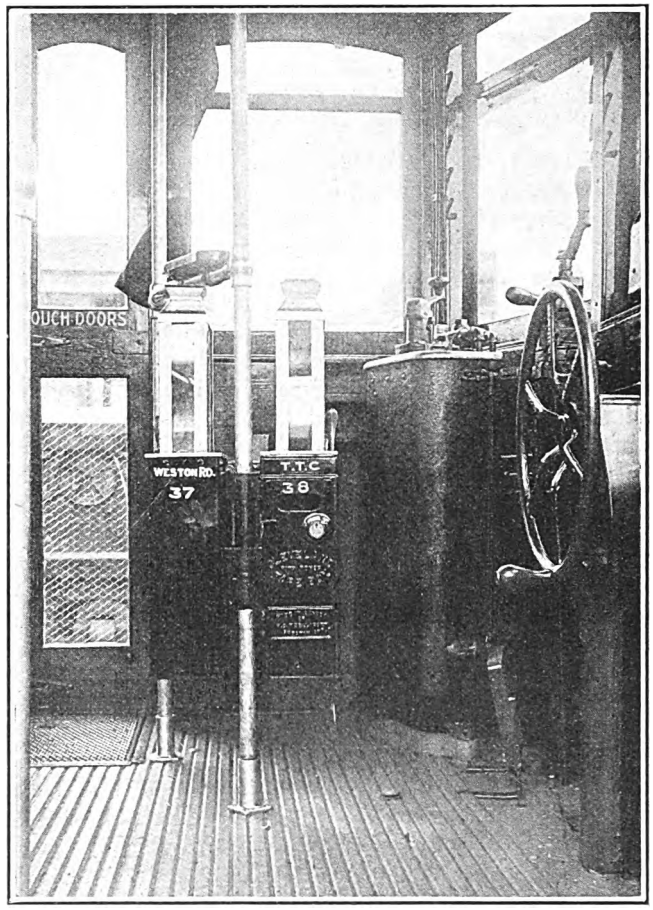
Opening of the door is controlled by the conductor and the closing of the door is controlled by the alighting passengers. Due to control interlocks the trains cannot be moved until the doors are all closed and proper circuits established. Red signal lights located in front of the motorman of the train and the conductor of the second car become illuminated while the rear treadle door of the second car is open, and by means of another special colored signal light the conductor of the second car is informed when the motorman is ready to proceed. This feature is also standard on all trail cars. The single-stroke bell and buzzer system is common to both types of trail cars.

Of the 70 cars taken over from the Toronto Civic Railway, 37 were of the double-truck, double-end, pay-as-you-enter type with rear entrance and exit and front exit doors, all manually operated. After the pronounced success of the one-man, double-truck, single-end front entrance and exit and rear treadle exit cars, it was decided to convert 28 of these 37 to cars of the one-man, double-truck, double-end, front entrance and exit, rear treadle exit type. There are two groups of this type, and although one seats 44 passengers and the of equipment in both vestibules is essentially the same in plan and general layout as shown. The arrangement of equipment in both vestibules is essentially the same as in the single-end car, except that the protective barrier beside the treadle is extended at an angle to the center of the car and used to support the operator's seat, fare box and change tray.

As it was desired to reduce the operator's duties to a minimum when changing from one end of the car to the other at terminals, the Nichols-Lintern red and green lights were interlocked in the controller by means of small additional switches fitted to each reverse drum. These switches are so connected that the operator in removing his controller handle and reverse lever, and adjusting them at the other end for forward movement, automatically completes or breaks the circuits to suit the direction of car movement. The Nichols-Lintern red light is grounded at the off position on the main drum of the controller at each end, and the latter part of this same circuit is used for completing the treadle electro-magnetic valve circuit at the respective ends. When the brake valve handle is removed the corresponding treadle-operated doors are made non-operative pneumatically. Interlocking of the electro-magnetic valves of the treadle door in the controller also makes them non-operative electrically in a semi-automatic manner to suit the particular direction of car movement.

On one group of fifteen of these 28 cars which is operated on a route having a periodic heavy volume of traffic loading and unloading, especially at one terminal, a ground or street conductor's control of the treadle-operated door has been designed and installed. Operation is by means of a special key which is applied by the street conductor to a concealed air cock located below the vestibule framing adjoining the door. The opening or closing of this cock opens and closes the treadle-operated door and is entirely independent of any movement by the operator on the car or a passenger stepping on the treadle. The air cock for street conductor's control of the door is connected to the main reservoir pipe, and from this to the valve puller cylinder pipe between the ball check valve and the main electro-magnetic valve. A branch pipe also goes to a double contact disk type pneumatic switch, and just ahead of this branch a ball check valve is fitted to prevent air acting on the pneumatic switch in the normal operation of the door. Closing of this pneumatic switch short circuits the contact switch below the treadle plate, and the other contact completes the electro-magnetic valve circuit to separate ground. When the ground conductor opens the special cock, air is admitted to the valve puller cylinder pipe and simultaneously, by means of the pneumatic switch, the electro-magnetic valve circuit is completed, energizing the valves, and air is admitted to the valve puller. The door will then open for alighting or boarding passengers. To close the door, the



Twin Fare Boxes Are Used to Permit Separate Accounting on One-Man Cars on Weston Road

street conductor simply closes the cock with the special key, and by reason of a small side vent in the cock, air is vented from the pneumatic switch, and the whole apparatus is promptly and automatically ready again for normal operation.

The equipment of this latter group of cars was evolved with a view to operation on a line that extends from a terminal at Keele and Dundas Streets in Toronto—West, in a northwest direction to the city limits at Northlands Avenue. From the city limits the line proceeds through the township of York, via the Mount Dennis district, to the north end of the town of Weston. The section in York and Weston was until recently owned and operated by the Toronto Suburban Railway, latterly acquired by the municipalities through which it passes. Control and management was vested in the Township of York Railway. The whole line at one time was owned by the Canadian National Electric Railways, but ownership of the city section some years previous passed into the hands of the Toronto Transportation Commission. The length of the line to the

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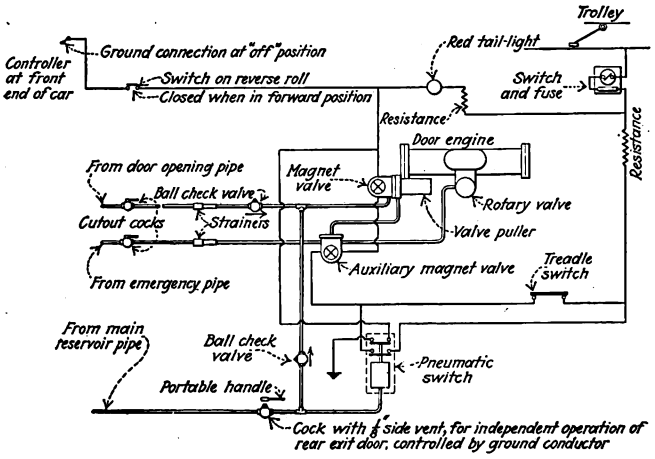

Pneumatic and Electric Details of Street Collector's Control on Toronto Car Rebuilt with Automatic Rear Exit

city limits is 1.11 miles and from there to the north end of Weston 3.54 miles, a total distance of 4.65 miles.

The Township of York Railway, associated with the other municipalities, has made a service-at-cost agreement with the commission, for the supply, operation and maintenance of the necessary rolling stock to equip this new co-ordinated through line. Revenue from the two zones must be kept separate, owing to the receipts being subject to an independent accounting, and so means had to be devised to keep separate the fares collected in the two zones. At each end of the car there are two fare boxes, painted contrasting colors, adjoining the operator's position and the passenger stream, and so mounted that either one or the other can be revolved into position for deposit of fares, depending on the zone of travel. The mouth of the box that is out of use is on the inside of the barrier and further concealed and blocked by the change tray adjacent.

On leaving the Toronto terminal, the red (or T.T.C.) fare box is in position, and the car proceeds to the city limits operating pay-as-you-enter, with passengers entering by the forward half of the front door and alighting by the rear or bulkhead half of this front door, or by the rear treadle exit door as desired. T.T.C. fares in this zone are collected on the outbound journey when passengers enter. On arrival at the city limits and after all passengers have alighted the black (or York Township Railway) farebox is moved into position, and the operator makes the rear treadle-operated door inoperative by closing the cut-out cock above mentioned. The car proceeds to the Weston terminal on the pay-as-you-leave principle, and all passengers desirous of alighting must deposit fares on leaving by the front door. Boarding passengers use the bulkhead half of this door, or both halves can be used for this purpose if no passengers are alighting. Township fares are collected only when leaving the car in this zone when outbound from the city. Inbound to the city the method is reversed.

During the traffic peak periods on this line, inbound in the morning and outbound in the evening, the heaviest loading and unloading occurs at the Toronto terminal. It is here that the street conductor's control of the rear treadle exit door on these cars has proved of great assistance as an auxiliary fare collecting point. It has enabled these one-man cars to load and unload quickly and maintain prearranged schedules quite easily.

Track Reconstruction in Sheboygan, Wis.

Modern Methods Employed by the Wisconsin Power & Light Company in the Rebuilding of Its Carhouse and Eighth Street Tracks

BY ALF A. OLDFIELD
Engineer Maintenance of Way Wisconsin Power & Light Company

RECONSTRUCTION of the entrance tracks to the carhouses on South Eighth Street and the reconstruction of ⅝ mile of double track and ½ mile of single track has advanced to a considerable extent the reconstruction program of the Wisconsin Power & Light Company in Sheboygan. One of the illustrations shows the completed six-track entrance to the carhouse from Eighth Street, including the special work required and the method of bringing the tracks from the street into the carhouse yards. The plan adopted eliminates the curbs, gutters and separate sidewalks, allowing the company's buses to enter the carhouse with ease.

Since service was maintained during construction, the plan of placing the operating track to one side was adopted, as shown in another illustration. A third picture shows the method of connecting a curve to a branch line during construction, while a fourth illustrates one completed track of the double-track line and the second track which has just been brought to grade and aligned ready for concreting.

The special work was built according to the engineering standards of the company and was supplied by the Lorain Steel Company. Solid manganese switches equipped with drain boxes were used, as were

Views Showing Reconstruction Work at Sheboygan by the Wisconsin Power & Light Company. At Left Is the Temporary Track Used During Reconstruction. At Right Is a Stretch of Finished Track Alongside of a Short Section Ready for Concreting

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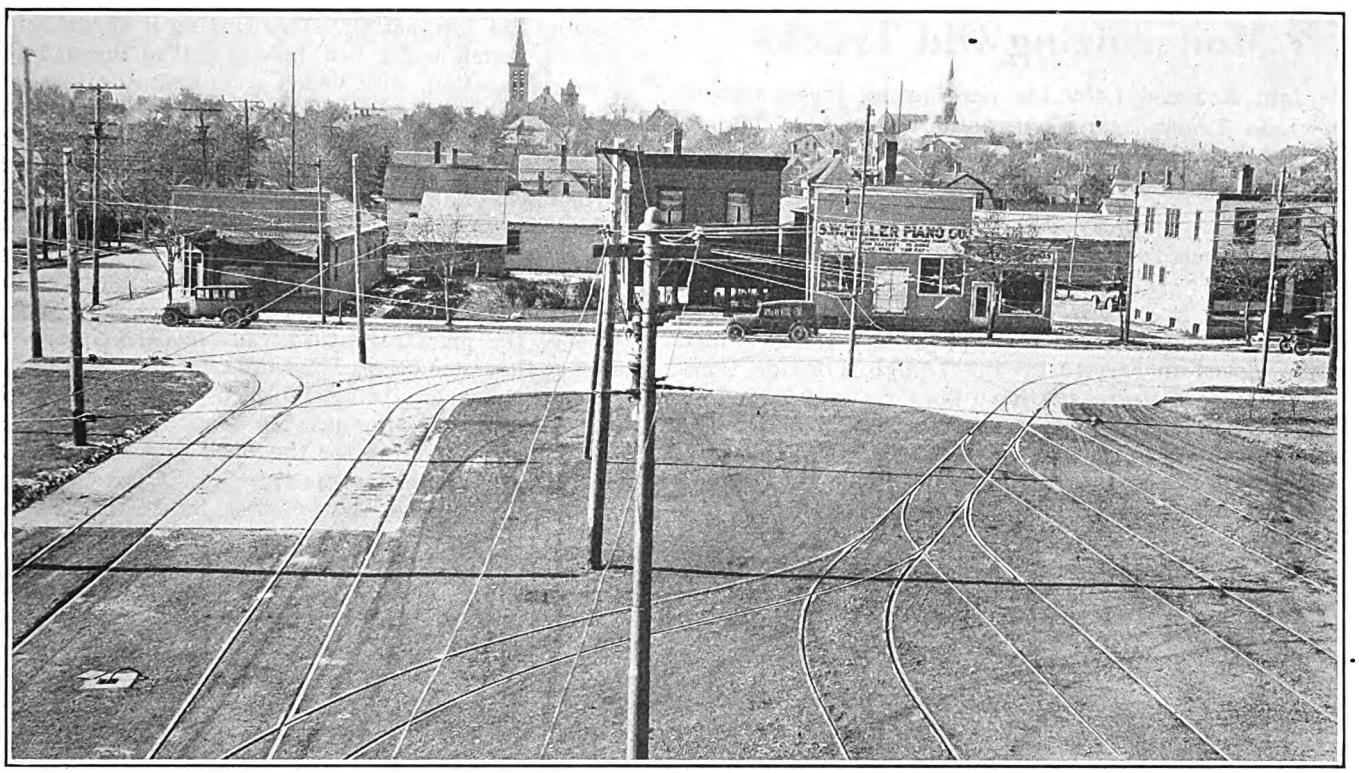


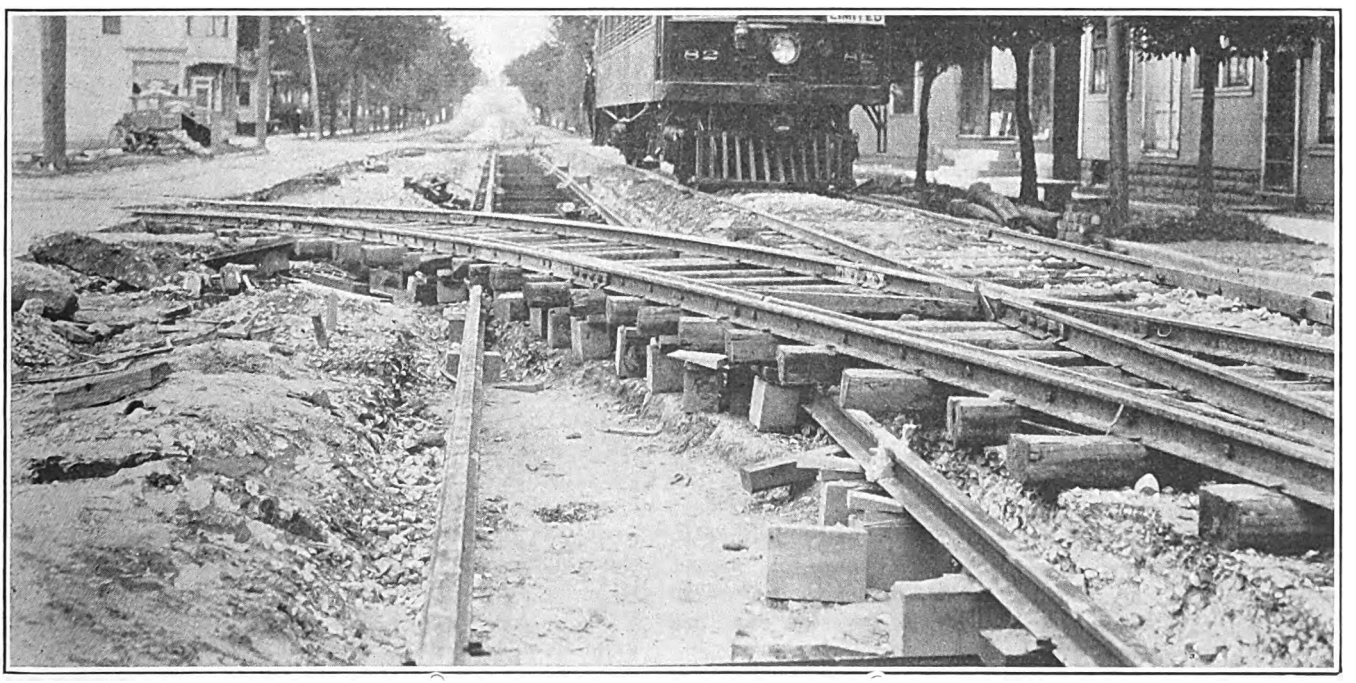
Reconstructed Entrance to Carhouse of Wisconsin Power & Light Company's Property at Sheboygan, Wis. Sidewalk, Curb and Gutter Have Been Eliminated to Provide Easy Access to Yards for the Company's Buses

hard center mates and frogs. The curves were built with section 140-468 guard rail on the inside and 93-507 T-rail on the outside. Under the special work 6-in. x 8-in. timbers were placed, with 8 in. of ballast under the ties. Reinforced concrete pavement is placed on top of the ties and the rolled ballast, which after tamping partially fills the space between ties.

For the straight track a relayer rail, section 80-362, originally rolled for the Victorian Railways of Australia, was employed, this rail having been recovered from the railroad that previously was in operation between Oshkosh and Omro, Wis., and which was abandoned during the year 1924. This rail showed very little wear. The straight track is supported on Dayton Resilient ties set in concrete.

For experimental purposes one track was built with Carey elastite rail filler and the other track without any filler. The result of this experiment indicates that the track in which the filler was used is considerably quieter in operation than the one without rail filler. The difference is so marked that it is planned to specify this rail filler in other reconstruction jobs. Rail joints on straight track were welded by using Alumino-thermic welds.

It is intended to complete the reconstruction of the Eighth Street line north of the carhouse this year.



Temporary Crossing of Branch Line During Reconstruction Work at Sheboygan, Wis., Used While Rebuilding Main Line Tracks on Eighth Street

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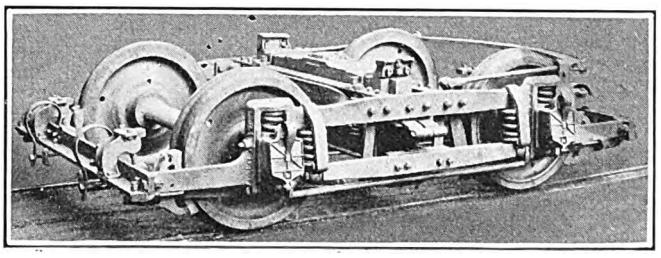
Modernizing Old Trucks

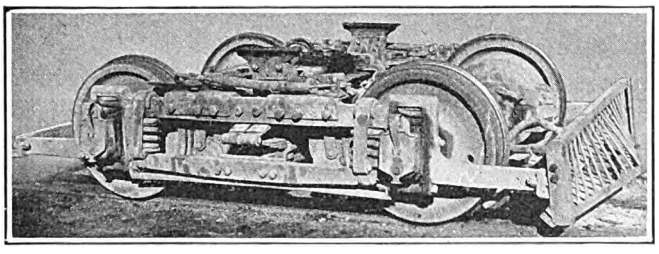
Weight Reduced 1,400 Lb. per Car by Incorporating Late Truck Improvements to Revamp a Type Purchased Nineteen Years Ago by the Lehigh Traction Company

BY JAMES W. BROWN
Superintendent of Shops Lehigh Traction Company, Hazleton, Pa.

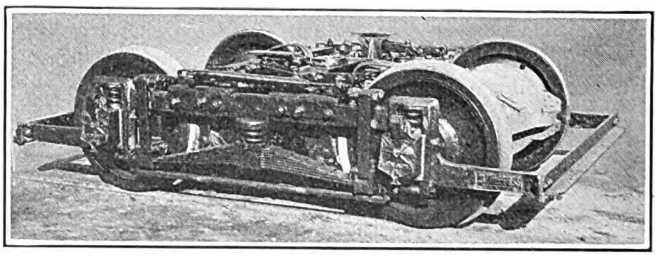
THROUGH the use of a number of late truck improvements some Brill type 27-E-1 trucks which were placed in service by the Lehigh Traction Company nineteen years ago have been reduced in weight approximately 700 lb. per truck or 1,400 lb. per car from that of the original type. The improved construction has also increased safety of operation and reduced troubles in service and maintenance costs. About two years ago the brake rigging on 24 cars was changed from an outside to an inside-hung type. This remodeling included the addition of necessary gusset plates, half-ball hangers, etc. This change reduced the weight of each truck 250 lb., or 500 lb. per car, and did away with twelve brake rods per car. A further remodeling is now being carried out which consists of applying Brill twin-swing links, steel bolsters, bolster guides, semi-elliptic springs, and a graduated spring system. This change has further reduced the weight 450 lb. per truck or 900 lb. per car. Twenty trucks have already been changed and the four remaining will be completed shortly.



Original Type of Brill 27-E Truck Purchased Nineteen Years Ago



The First Step in Remodeling Was Taken Two Years Ago, When Brake Rigging Was Changed to Inside Hung Type, with a Saving of 250 Lb. per Truck



The Modernized Truck as Now Completed with a Total Truck Weight Reduction of 700 Lb. Has Improved Riding Characteristics

Accompanying illustrations show the truck as originally purchased, the truck after its first rehabilitation, and the truck as now being modernized. To make these changes, all truck parts are dismantled except the side bars, end angles and transoms. Rivets and bolts are tested carefully and if any are found loose they are removed, the holes are plugged and redrilled, and new rivets and bolts inserted. Before riveting, the trucks are carefully squared. All corner brackets that are worn or broken are renewed, and any holes in the bolster transom that interfere with holes in gusset plates to be added are plugged, redrilled and reamed to fit turned bolts, which are used to secure the gusset plates to the transom. When the gusset plates are in place on the truck frame, holes in the side bars are drilled and reamed for 1⅛-in. turned bolts.

In order to apply the twin-swing links, it is necessary to dress out the truck frames with an air chisel, to fit the swing link top casting. This casting is shrunk onto the truck frame and a ½-in. hole is drilled through the frame and casting, into which countersunk rivets are applied. After the gusset plates are finished and bolted to the frame, the plates have a hole 1½ in. in diameter drilled for the bolster guide pin. New bottom tie rods are installed which are made of 2½-in. x 1-in. flat machine steel. This flat portion is carried out 7 in. from each end and then welded to a 1½-in. round steel rod. The first portion acts as a safety hanger for the elliptic spring in case this should break.

One of the principal reasons for modernizing these trucks at this time comes from the fact that ten wooden type car bodies are being replaced with late all-steel type. These new bodies provide a seating capacity of 70 as compared with 46 for the wood type. All this is accomplished without increased weight in the car body.

At the time that the first changes in the trucks were made about two years ago, steel pilots were installed in place of wooden pilots previously used on these cars. This produced a weight reduction of 110 lb. per truck or 220 lb. per car. In the construction of these pilots particular care was taken to make them interchangeable, so that their removal and replacement take but from fifteen to twenty minutes.

The work of modernizing these trucks is carried out by the regular shop forces and so a definite schedule cannot be followed. Four men are used in making these changes, and in addition one air brake inspector oversees the work and two machinists, one acetylene welder, one blacksmith and helper and one electrician and assistant take care of the necessary work in their particular lines. The cars are brought in for this general rehabilitation at a time when the wheels need turning. At the same time general repairs are made to the motors, brake rigging and air equipment. The cost of rehabilitating the trucks, together with the other repairs made, averages $830.

The shop in which this work is done has but one track with a pit running its entire length. Work of rehabilitation is done on this track. A 15-ton crane operates the entire length, and in addition, two 30-ton hydraulic jacks are used for lifting the car bodies from the trucks. The shop equipment used consists of a 60-in. lathe on which all wheels are bored and turned, a 24-in. lathe, a 14-in. lathe, one drill press, one twist drill grinder, one wheel for general grinding, a shaper, drill, power hacksaw, bolt and pipe cutter, and a 400-ton wheel press, two air and one electric drills and an air riveter.

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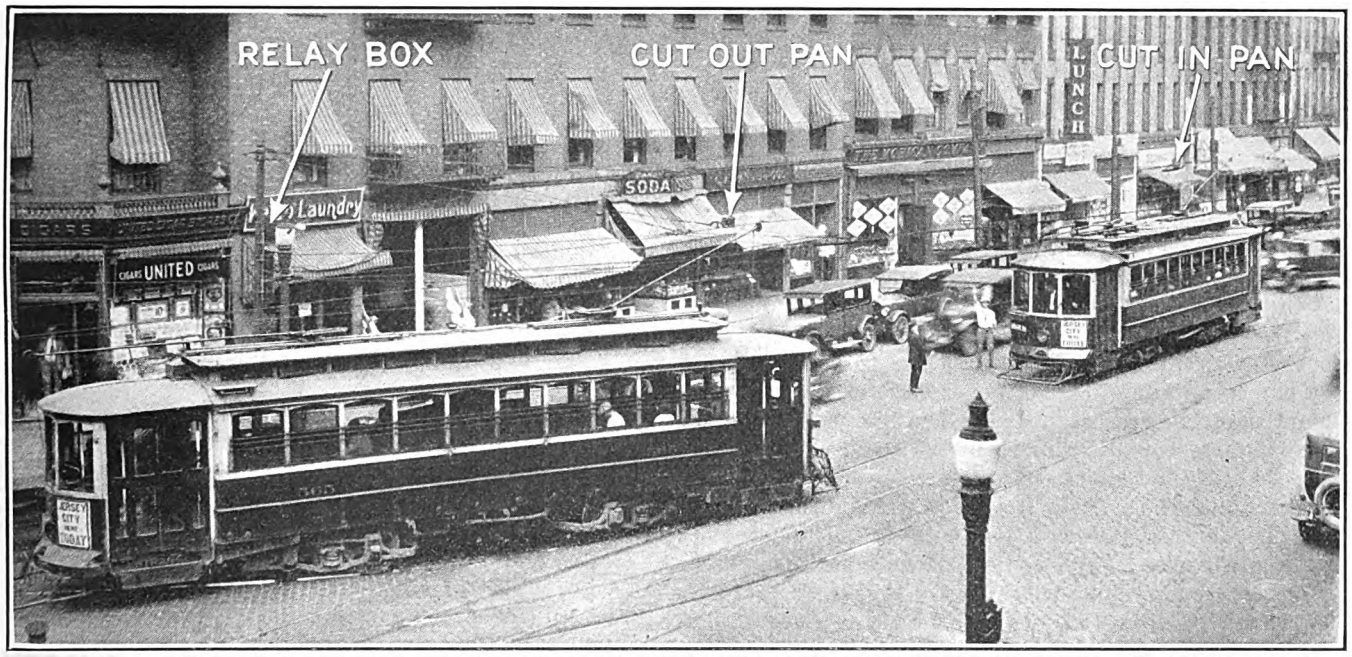
Safe Methods of Operating Electric Track Switches

Thorough Instructions Given to Motormen in Rochester Have Reduced Troubles from Throwing Switches Under Rear Trucks of Preceding Cars

By Leon R. Brown
Director of Safety New York State Railways, Rochester, N. Y.



Location of Cut-In Pan, Cut-Out Pan and Pole Box. The Rear Truck of the Leading Car Has Passed the Track Switch

WHILE an electric railway car operator knows that if he passes the "cut-in pan" with power off the switch will throw for the straight track and if he passes with power on it will throw for the curve, still he does not know why it acts nor why it sometimes does not work. Since some difficulty was experienced on the Rochester Lines of the New York State Railways from motormen throwing switches under the rear trucks of preceding cars the safety director prepared charts and diagrams and gave a series of talks to the men at the various carhouses. At these conferences the men were encouraged to discuss their problems and to tell their experiences. Many valuable things were learned.

Two posters, copies of which are shown herewith, were prepared. One of these shows the general layout of an electric switch installation giving the location of the "cut-in pan" and the "cut-out pan" on the trolley wire and the track switch under the "cut-out pan." The poster also explains what not to do and why not to do it. The other poster shows in detail a diagram of the apparatus and explains how it operates. Of course it was not expected that many of the men would be interested in the technical manner in which the switch operates, but in order that they might understand the reason why they must operate slowly on the pan and why they must do other things, the explanation was given. It was surprising how many of the men were interested in the technical description of the operations of the electric switch.

Another line drawing shows a detail of the "cut-in pan" and just how the trolley wheel bridges the gap between the contact pieces, completing the various circuits. The first contact determines whether the car is going to take the curve or the straight track; the second throws the switch, while the last locks it by breaking the circuit, thus preventing another car from throwing the switch until it is unlocked by a car tripping the cut-out pan.

The relays, coils and resistances are on the pole at the curb. The wires come overhead from the trolley and underground from the switch. The "cut-in pan," which is on the trolley wire about 60 ft. back of the switch point, is about 4 ft. long. As the diagram shows, it is not in contact with the trolley wire, which passes over it. The "cut-in pan" itself consists of one long contact strip on one side and a series of shorter contact strips on the other side, each of which is insulated from the others. When the trolley wheel passes over the "cut-in pan," one flange comes in contact with the long strip, while the other flange comes in contact with the series of shorter strips, closing the circuits between them. This operation takes place whether power is on or off. When the trolley wheel crosses the cut-out pan it acts as a switch and closes and opens several electric circuits in the short interval it takes to cross this pan. These

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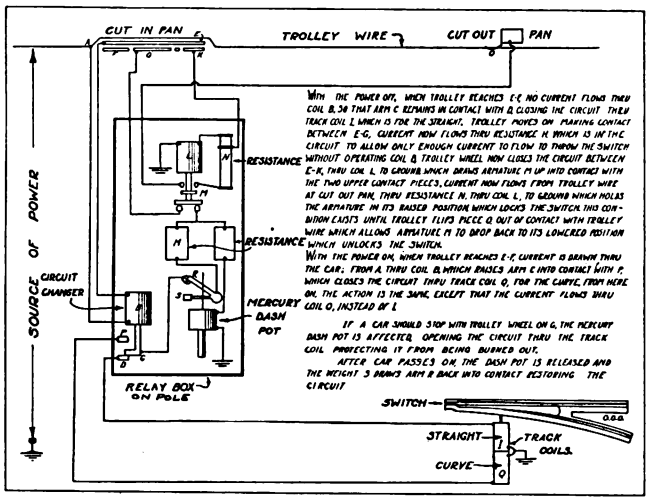
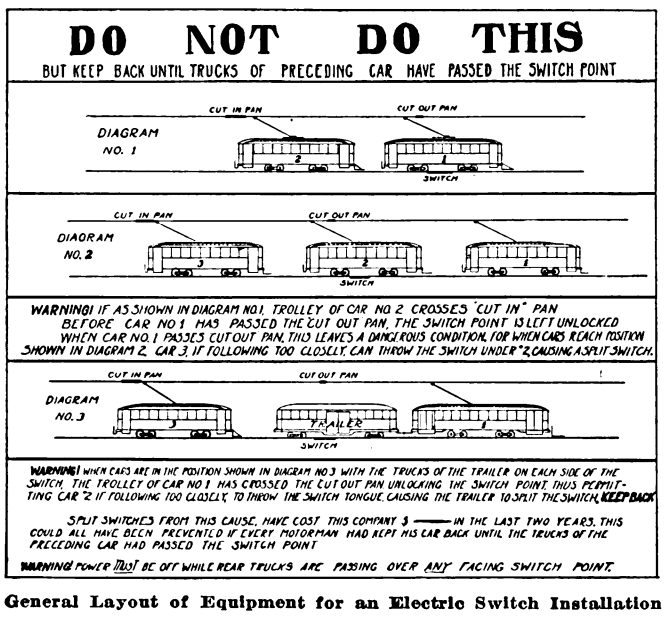


Diagram of the Switch-Throwing Circuits

operations always take place in exactly the same sequence. The opening and closing of these circuits energizes the magnets on the switch and throws the switch point.

The switch point is thrown to the curve or to the straight according to whether the controller is on or off when the trolley wheel passes across this pan. If power is turned on or off at any time when the trolley wheel is on the pan it is probable that the switch will not be operated as intended. It may not throw, it may reverse or it may be left unlocked, depending on which contact point the trolley wheel touched when the power changed. This doubtless explains many of the queer stories which are told of the failures of electric switches to operate properly. If the car is going too fast while passing over the "cut-in pan" it readily can be seen that not enough time will elapse between the various operations. The chances are that the switch will not operate properly. There is also danger of injuring the complicated mechanism. Speeds of 3 to 4 m.p.h., or about the rate a man would walk, are approximately correct for passing under the "cut-in pan."

The last operation, as the trolley wheel leaves the cut-in pan, is to lock the switch so it cannot be thrown until the car passes the cut-out pan. This latter is merely a flip on the trolley wire, which is tripped when the trolley wheel passes under. The locks and cut-out

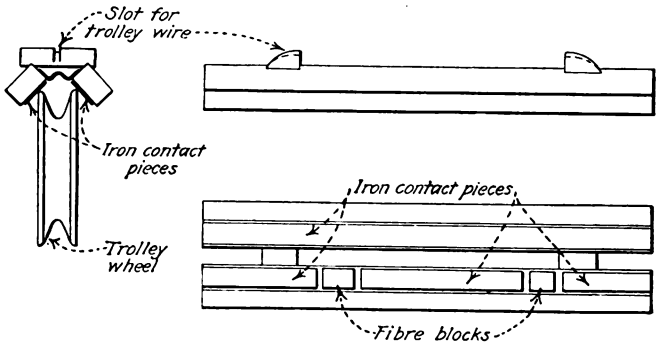


General Layout of Equipment for an Electric Switch Installation

pans are not on the electric switches in Syracuse and Utica and there seems to be a misunderstanding about them by the men in Rochester. Nearly all the men were under the impression that by this arrangement they could not throw a switch under a preceding car. It was the principal purpose of these talks to explain that it was possible to throw a switch under a preceding car and what must be done to avoid doing so. The only safe rule to follow in order to avoid throwing a switch under a preceding car is not to allow the trolley wheel to pass the cut-in pan until the rear trucks of the preceding car have crossed the switch point.

There are two conditions where it is possible to throw a switch under a preceding car. If car No. 2 has come under the cut-in pan before No. 1 has gone under the cut-out pan car No. 2 is left unprotected, because when car No. 1 goes under the cut-out pan the switch is left unlocked, thus permitting car No. 3 to throw the switch under car No. 2 if it comes under the cut-in pan before No. 2 has passed the switch.

The other condition where a car following too closely can cause a split switch is with a trailer train. When the first car passes the cut-out pan it leaves the switch



Trolley Contactor for Cut-In Pan

unlocked. The car following the trailer train will of course throw the switch under the trailer if it comes under the pan too soon.

There was much discussion as to how many points of power were necessary in order to throw the switch. The old motormen seem to have learned by experience just how many were necessary for the different types of cars. On the ordinary four-motor car usually two points of power will throw the switch. On a two-motor car at least four points are necessary. To throw a switch which is on a down grade it is necessary to bring the car nearly to a stop on approaching the "cut-in pan" and then throw the power on. This prevents crossing the cut-in pan at too high a speed and insures enough current to throw the switch.

Another point brought up was that sometimes the combination of electric heaters, air compressor motors and lights produced enough current to throw the switch even with the controller off. The magnet coil which selects the curve or the straight position for the switch point has an adjustment so that ordinarily it cannot throw the switch except by power from the controller. Adjustments are made every spring and fall to compensate for heater and light current. However, in the early fall and late spring, when the electric heaters are used for only a short time morning and evening, the switches may not be adjusted and motormen should be cautious. On the interurban cars it usually is necessary to cut off the heaters and air motors when passing electric switches. Study of the electrical operation of switches indicates that the apparatus is quite delicate.

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Co-ordinated Bus Service for Cincinnati

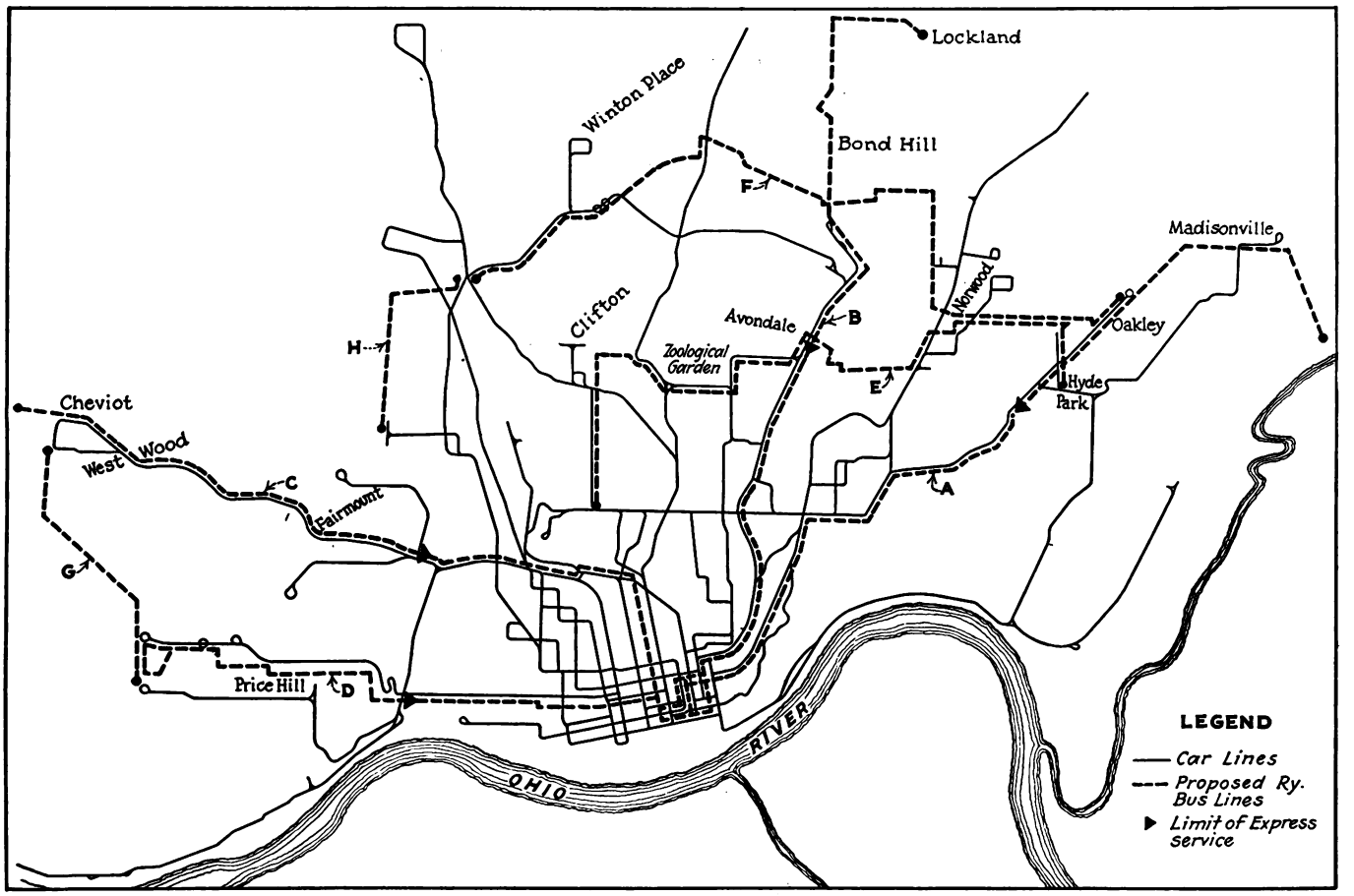
Routes Proposed by Cincinnati Street Railway Designed to Supplement Existing Rail Lines —Crosstown Service to Facilitate Travel in City—Express to Reduce Time to Outlying Communities

CO-ORDINATED bus and rail routes which will give maximum transportation service with minimum duplication of facilities is the principal objective in the plan recently submitted to the City Director of Street Railroads by the Cincinnati Street Railway. In a letter accompanying the formal application for a permit to operate buses, which was abstracted in the Dec. 19, 1925, issue of ELECTRIC RAILWAY JOURNAL, page 1091, President W. A. Draper outlined the advantages to be obtained, as follows:

1. Provide the beginning of a system of motor bus operation which may be extended as later warranted.
2. Formulate present plans with a view to their adaptability to the future.
3. Provide service where there is a lack and a need of it.
4. Avoid disturbing existing transportation facilities more than is necessary to provide the additional facilities considered needful.

The initial bus system, which is shown on the accompanying map, comprises eight routes to serve various sections of the city and suburbs. These are of three general classes: (1) Crosstown routes; (2) express routes to cut the time to outlying sections where ample local service is now provided by street cars; (3) feeder routes reaching districts not adequately provided with street car service.

In his letter to the director of street railroads President Draper carefully outlined the principles on which



Eight Bus Routes Will Give a High-Speed Service Supplementing the Street Cars in Cincinnati. The Arrow Points Show Where Express Operation Begins

the plans for a co-ordinated transportation system are based. The advantages accruing to the community from this co-ordination of rail and bus are pointed out. While recognizing these advantages, he proposes a careful separation of bus and railway accounts for the purpose of fixing rates of fare on the buses that will provide a revenue commensurate with the character of service rendered. Mr. Draper covered these principles as follows:

It is believed that the beginning of a bus transportation system has been worked out that will be of distinct advantage to the communities served and yet will be sufficiently remunerative not to add an unwarranted

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burden on the hundreds of thousands of street car riders who will continue to be so served. It has not been forgotten that the motor buses now proposed to be put on the streets will become a part of the whole transportation system.

Due regard has been given to the fact that while some are attracted to the newer type of transportation, there are many to whom the lower street car fare will always be a consideration. The recent reduction by which 5 cents is saved on every three rides should not be endangered by motor bus operations that would add unduly to the operating cost under the service-at-cost franchise.

Buses to Pay Own Way

Therefore a separate and accurate system of accounting will be kept that it may be known if the motor bus operation is paying its own way; and if it does not do so it is believed that the patrons of the motor bus service will be willing to pay such a rate as the city may find necessary to make it self-supporting.

It is believed that the express or preferential service proposed will be of distinct advantage. The argument advanced in favor of motor bus service is that it is a time saver. The greater the distance to be covered the more possible is the saving of time. On some of the shorter bus lines now operating there is actually no saving in time over street car operations, while on some of the longer lines the saving in time is appreciable.

A study indicates that there are points within a certain distance from the center of the city where prospective passengers will ride either the car or the motor bus that comes first. Applying this experience, it is proposed to operate the longer radial lines for the benefit of those outlying communities that are far enough from the center of the city to make such service desirable.

The two crosstown lines will meet a need that has long existed. Route E, the Clifton-Hyde Park line, will connect the residential suburbs indicated by the name, as well as Corryville, Avondale, Evanston and Norwood, and will also offer a direct line to the University of Cincinnati, Hughes High School and the other institutions in the same neighborhood. The Cumminsville-Oakley line will tie those suburbs and Winton Place, Ivorydale, St. Bernard, Bond Hill and Norwood, with the several factory and residential districts in those sections.

Future Needs Considered

It will be apparent that the system of motor bus operations, of which this is a beginning, will lend itself to a development of transportation facilities of all forms. While motor bus transportation from its flexibility is generally considered as quite easy to change or discontinue in one section or another, nevertheless it should not be established unless it is reasonably certain that it can be continued. The operations now proposed are all planned to take care of future needs as well as present, and there is probably only one line proposed, the Cumminsville-Oakley line, that will not meet a continuing need. The operation of the rapid transit line in the future may render the continued operation of this line unnecessary. All of the other lines but two can be operated as feeders to the rapid transit line if it is so decided.

The four radial lines—A, B, C and D on the accompanying map—are to be express lines. Between the business district and the arrow marks shown on the map inbound buses will stop only to discharge passengers, and outbound buses will stop only to pick up passengers for points beyond the limits indicated by the arrows.

A fare of 10 cents for buses inside the city limits is contemplated. On lines which extend beyond the city lines an extra 10 cents will be charged. Free transfers will be issued from buses to cars at all intersections. Transfers will also be issued from cars to buses on payment of the full bus fare of 10 cents instead of the car fare of 8⅓ cents. Where two bus lines intersect transfers will be issued between them free.

Details of Routes

The various routes proposed, together with the principal features of their operation, are outlined below. It is planned to use 29-passenger single-deck buses for all routes.

Route A (Oakley-Mariemont).—From Government Square to Main Street, to Eighth Street, to Gilbert Avenue viaduct, to Gilbert Avenue, to Windsor Street, to Kemper Lane, to McMillan Street, to Woodburn Avenue, to Madison Road, to Plainville Pike, to Wooster Pike, to Mariemont town center. Returning on Wooster Pike to Plainville Pike, to Madison Road, to Woodburn Avenue, to McMillan Street, to Kemper Lane, to Windsor Street, to Gilbert Avenue, to Gilbert Avenue viaduct, to Eighth Street, to Walnut Street, to Government Square.

Number of buses—Nine.

Schedule—Non-rush hours, every twenty minutes from Government Square to the Mariemont town center; rush hours, every ten minutes from Government Square to Oakley, and every twenty minutes from Government Square to the Mariemont town center.

Fare—Ten cents from Government Square to Madison Road and Gomien Street, Madisonville, and between intermediate points; 10 cents from Mariemont town center to Madison Road and Dunbar Place and between intermediate points on this bus line only without transfer privilege, and 20 cents between all other points.

South and west of Madison Road and Observatory Avenue inbound buses will stop only for the purpose of discharging passengers boarding buses north and east of that point, and outbound buses will stop only for the purpose of receiving passengers destined beyond that point.

Route B (Bond Hill-Lockland).—From Government Square to Main Street, to Ninth Street, to Sycamore Street, to Reading Road, to Paddack Road, to Seventy-third Street, to Carthage Avenue, to Springfield Avenue, to Wyoming Avenue, to Benson Avenue, to Central Avenue. Returning on Benson Avenue, to Wyoming Avenue, to Springfield Avenue, to Carthage Avenue, to Seventy-third Street, to Paddack Road, to Reading Road, to Sycamore Street, to Ninth Street, to Walnut Street, to Government Square.

Number of buses—Seven.

Schedule—Every twenty minutes during non-rush hours, and every fifteen minutes during rush hours.

Fare—Ten cents from Central Avenue, Lockland, to B. & O. crossing, Bond Hill, and between intermediate points on this bus line only without transfer privilege; 10 cents from the Cincinnati-Wyoming corporation

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line to Government Square and intermediate points, and 20 cents between all other points.

Express operation south of Reading Road and Dana Avenue.

Route C (Westwood-Cheviot).—From Government Square to Main Street, to Sixth Street, to Race Street, to McMicken Avenue, to Mohawk Place, to Central Avenue, to Harrison Avenue, to the Harrison Avenue viaduct, to State Avenue, to Harrison Avenue, to the Cleves-Bridgetown Pike. Returning on Harrison Avenue, to State Avenue, to Harrison Avenue viaduct, to Harrison Avenue, to Central Avenue, to Mohawk Place, to McMicken Avenue, to Race Street, to Fifth Street, to Government Square.

Number of buses—Six.

Schedules—Non-rush hours, every twenty minutes; rush hours, every 15 minutes.

Fare—Ten cents.

Express operation east and south of Beekman and Harrison Avenues.

Route D (Price Hill).—From Government Square to Main Street, to Sixth Street, to Race Street, to Ninth Street, to McLean Avenue, to Eighth Street viaduct, to Eighth Street, to the Price Hill inclined plane, to Matson Place, to Price Avenue, to Woodlawn Avenue, to Warsaw Avenue, to St. Lawrence Avenue, to Rosemont Avenue, to Glenway Avenue, to Overlook Avenue, to Rapid Run Pike. Returning on Rapid Run Pike, to Glenway Avenue, to Rosemont Avenue, to St. Lawrence Avenue, to Warsaw Avenue, to Woodlawn Avenue, to Price Avenue, to Matson Place, to the Price Hill inclined plane, to Eighth Street, to the Eighth Street viaduct, to McLean Avenue, to Ninth Street, to Race Street, to Fifth Street, to Government Square.

Number of buses—Five.

Schedule—Non-rush hours, every fifteen minutes; rush hours, every ten minutes.

Express operation east of Eighth Street and State Avenue.

Fare—Ten cents.

Route E (Clifton-Hyde Park).—From Clifton Avenue and McMillan Street on Clifton Avenue, to Glenmary, to Vine, to Erkenbrecher Avenue, to Burnet Avenue, to Rockdale Avenue, to Reading Road, to Dana Avenue, to Montgomery Road, to Williams Avenue, to Floral Avenue, to Robertson Avenue, to Duckcreek Road, to Edwards Road, to Erie Avenue. Returning via the same route.

Number of buses—Nine.

Schedule—Non-rush hours, every fifteen minutes; rush hours, every ten minutes.

Fare—Ten cents.

Route F (Cumminsville-Oakley)—From Knowlton's Corner on Spring Grove Avenue, to Murray Avenue, to Laidlaw Avenue, to Paddack Road, to California Avenue, to Reading Road, to Dale Road, to Carthage Avenue, to Montgomery Avenue, to Smith Road, to Robertson Avenue, to Brownway Avenue, to Madison Road, to B. & O. crossing. Returning via the same route.

Number of buses—Nine

Schedules—Non-rush hours, every twenty minutes; rush hours, every ten minutes.

Fare—Ten cents.

Route G (Price Hill-Westwood).—From Eighth Street and Nebraska Avenue, along Nebraska Avenue to Rapid Run Pike, to Overlook Avenue, to Bridgetown Pike, to Boudinot Avenue, to Bridgetown Pike, to Glenmore Avenue, to Harrison Avenue. Returning via the same route.

Number of buses—One.

Schedules—Every 30 minutes.

Fare—Ten cents, but without transfer privilege.

Route H (Fairmount-Cumminsville).—From the Hopple Street viaduct and Beekman Street, on Beekman Street, to Powers Street, to Colerain Avenue, to Knowlton's Corner. Returning via the same route.

Number of buses—One.

Schedules—Every twenty minutes.

Fare—Ten cents.

Electric Shop Truck Earns $6,000 a Year

For Cutting the Cost of Handling Heavy Material a High-Lift Electric Truck Operates Through the Milwaukee Shop on a Definite Schedule

BY HAROLD J. PAYNE
Staff of the Society for Electrical Development, Inc., New York City

WITH skilled labor high and unskilled workers expensive and also difficult to obtain, the Milwaukee Electric Railway & Light Company was faced with a definite need for conserving man power. Two years ago a high-lift electric truck was purchased for doing general handling work about the Cold Spring shops. Since that time the machine has been earning the wages of six men by taking the place of hand trucks and wheelbarrows which were previously used for moving parts and materials. Additional use for the truck has been found continually, so that it has been kept busy loading material into supply cars for transportation to other stations or towing trailers, tool wagons, etc., moving snowplows and like equipment for storage during summer months, hoisting stoves into cars, where these were used for heating; putting car compressors

SCHEDULE CARD FOR NINE TRIPS OF THE ELECTRIC TRUCK

Department	Trip 1	Trip 2	Trip 3	Trip 4	Trip 5	Trip 6	Trip 7	Trip 8	Trip 9
Machine gallery	8:20	8:24	9:06	10:30	11:12	12:35	1:12	2:36	3:18
No. 1 storeroom	8:18	8:28	9:10	10:34	11:16	12:39	1:16	2:40	3:22
Armature room	8:15	8:30	9:12	10:36	11:18	12:41	1:18	2:42	3:24
Machine main	8:10	8:35	9:17	10:41	11:23	12:46	1:23	2:47	3:29
Forge shop	8:00	8:38	9:20	10:44	11:26	12:49	1:26	2:50	3:32
Steel shop	7:56	8:39	9:21	10:45	11:27	12:50	1:27	2:51	3:32
Brass foundry	7:55	8:40	9:22	10:46	11:28	12:51	1:28	2:52	3:34
Motor and truck	7:50	8:45	9:27	10:51	11:33	12:56	1:33	2:57	3:39
No. 2 storeroom	7:45	8:48	9:30	10:54	11:36	12:59	1:36	3:00	3:42
No. 6 storeroom	7:10		9:35		11:41		1:41		3:47
Bus department	7:15		9:38		11:44		1:44		3:50
Paint shop	7:20		9:40		11:46		1:46		3:52
Tin shop	7:30		9:45		11:51		1:51		3:57
Carpenter shop	7:35		9:50		11:56		1:56		4:02

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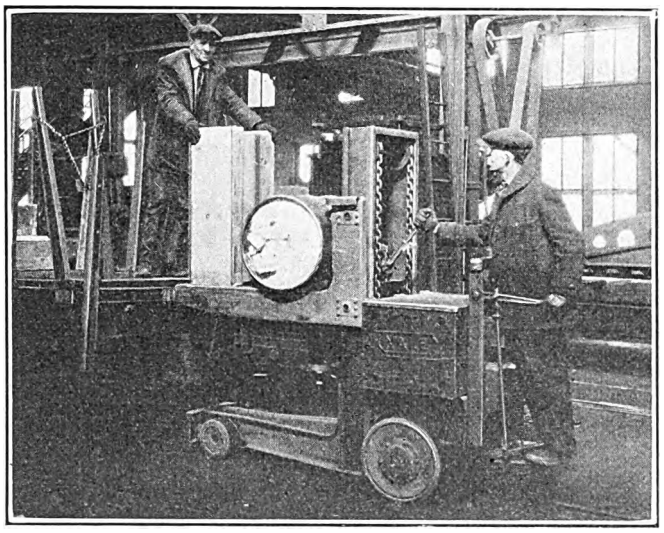


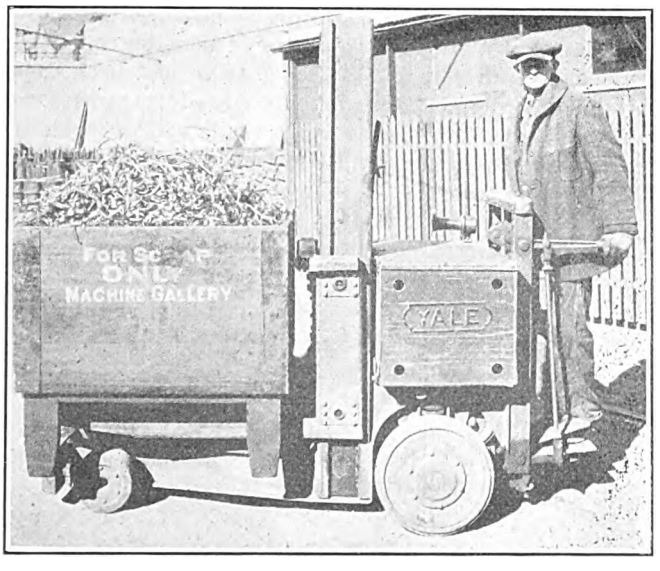
Loading Material Directly to the Electric Truck as It Is Received in the Shop

into position and hauling barrels of oil and other heavy parts to specific locations where they are used.

The particular type of truck adopted is a model K-22 Yale, made by the Yale & Towne Manufacturing Company. It can raise and lower its load 26 in. This has proved of particular benefit, as much material requires loading and unloading at an elevation. Smaller parts and materials used in the maintenance and repair of equipment are nearly all stored in box containers or on platforms. These are arranged with supports so that the platform of the truck can be driven directly underneath and the material elevated and taken away without trouble. Four-wheel steering is provided in the equipment, which makes it very flexible and capable of working in close quarters.

Accompanying illustrations show two classes of work in which the truck is used. One illustrates the convenience of loading material directly from a large highway truck to the smaller shop truck. A barrel of gasoline has been placed in position and a box of other materials is being added. The second illustration shows the method of picking up and transporting scrap turnings from the machine shop.

In common with other types of industrial equipment, the electric truck requires reasonably intelligent use if it is to yield a maximum return on the investment. At the Cold Spring shops a preliminary survey was made of the routes over which material was flowing. Information was also assembled as to the nature and quantity of the material. This survey showed that in the routine operations of the shop approximately the same volume of material had to be moved every day. Consequently it was decided to operate the truck on a schedule over a fixed route, covering fourteen divisions of the shop. The accompanying table gives the various departments that are visited by the truck and the time that stops were made at each department for nine trips. The driver punches a time clock at the start and finish of each trip. In an ordinary day he moves 100 loads of material, each of which may run up to 7,000 lb. in weight. The schedule time for a trip is about 50 minutes. When trips are completed in less than scheduled time the truck is available for odd jobs, such as stacking materials and placing equipment in cars.



Picking Up a Box of Machine Shop Turnings Preparatory to Delivering It to the Scrap Storage

In addition to eliminating the need for a gang of hand truckers the use of the electric truck has accomplished other objects. By having material ready for use ahead of time skilled workers are not kept idle waiting for supplies. Operations can also be scheduled and the schedules can be rigidly adhered to. This insures that the service requirements of all the divisions of the shops will be met. The elimination of congestion throughout the shops has followed handling of materials by the electric truck. The operator has a much less trying and fatiguing job to handle material in this manner and as a result it is handled more promptly. In the Milwaukee shop approximately 200 skid containers are used for this service. Their use has assisted materially in maintaining a perpetual inventory of stock and the keeping of this inventory has been simplified through their use.

In the two years that this truck has been in service repairs have been a negligible quantity. The truck has been overloaded frequently and its popularity has necessitated almost continuous service inside and outside the shop. Outside weather conditions such as snow and ice have not interfered with its operation.

One problem was encountered in connection with the transporting of material to the machine gallery, which is located on the second floor of the shop. The elevators serving this gallery were of insufficient capacity to carry the trucks when fully loaded. This difficulty, however, was overcome by carrying the trucks and loads separately, hand-lift trucks being used for moving the loads over short distances such as on and off the elevator.

Solid Colors for Denver Cars

THE Denver Tramway, Denver, Col., painted about 50 of its cars with an aluminum paint, a flat silver hue. They were very pretty, and as the sunbeams struck them as they rounded a curve they glistened with a real splendor, but they are so hard to keep clean the color is impracticable. This silver color was flat and unvarnished, but now a chrome yellow, part varnish, is being tried. As to which is the prettier, that all depends upon the individual. It is the plan of the company to omit stripes, to use a solid color and to spray on the paint. With about 370 cars to be painted every three years, it is estimated that the paint bill for this work will be reduced more than $11,000 under the new method.

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Rebuilding Pole Rack

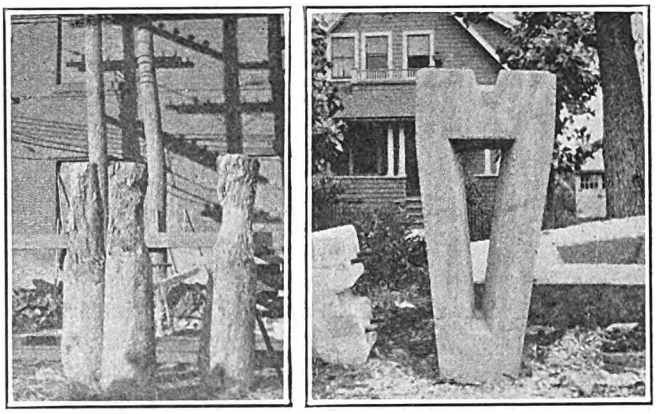
New Concrete Bases Were Placed Under Old Poles Alongside Berlin Substation of the Connecticut Company at Small Cost

ADJACENT to the Berlin substation of the Connecticut Company a 40-ft. six-pole tandem rack is maintained to carry five three-phase circuits of 11,000 volts each and seven 600-volt direct-current feeders ranging in size from 300,000 to 500,000 circ.mil. The latter supply current for the local electric railway lines. Chestnut poles in the rack had been in place about eighteen years. As they had been set in swampy ground, consisting of moist red clay with an upper fill of cinders, the bases were badly deteriorated. Crossarms and insulators, however, were in excellent condition, as were the poles themselves above the ground line. Possible alternatives were either to replace the poles with new ones, with the consequent expense of new upper structures and overtime rates to workmen changing over at hours when the high-tension circuits could be killed, or to reclaim the present poles and not disturb the upper structures or interrupt the service.

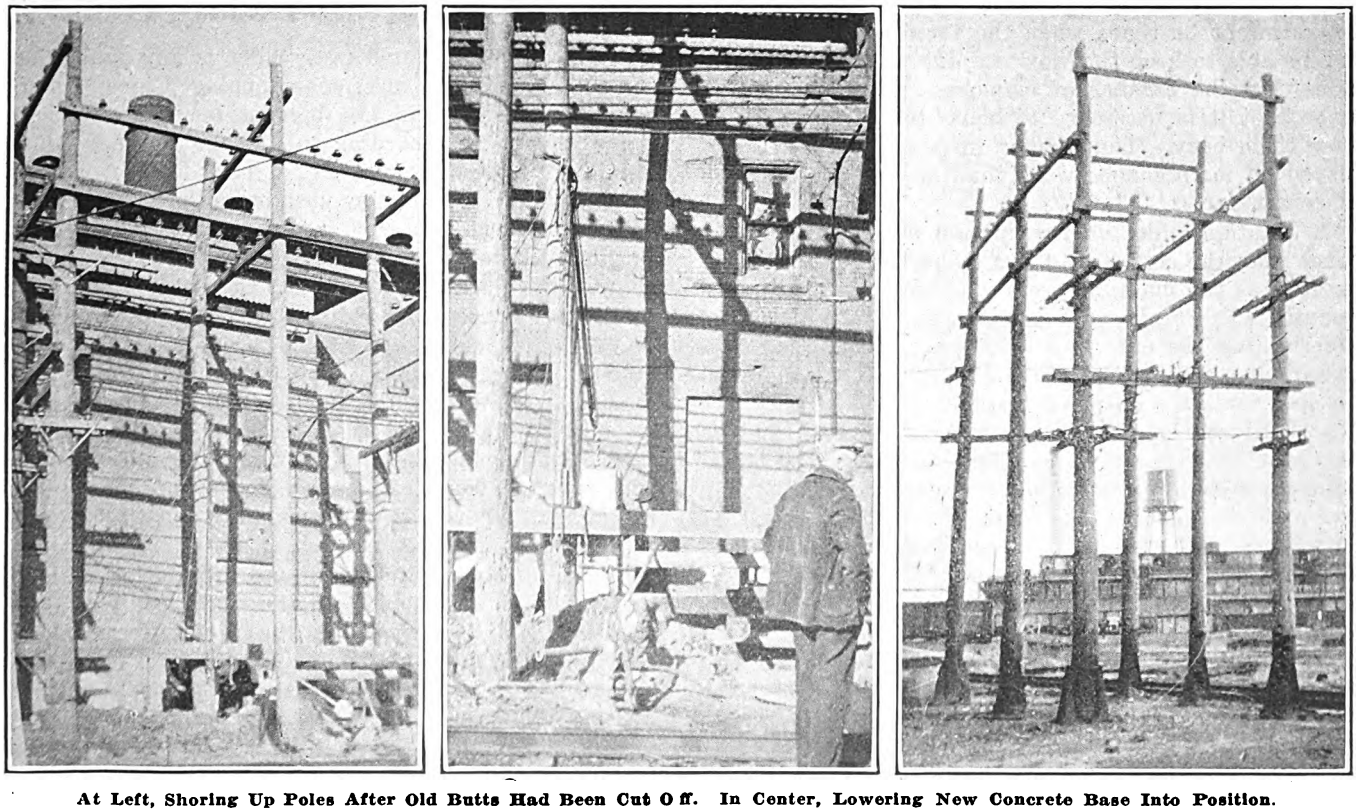
The second plan was considered the more satisfactory and it was decided to reclaim the present poles by cutting off their bottoms and mounting them on concrete bases. These consisted of V-shaped blocks into which four 1⅜-in. x 5-ft. anchor bolts had been cast, the entire concrete base with bolts weighing about 1,350 lb. On top of the base were mounted two malleable iron castings. The pole was securely clamped between the castings by means of six "U" bolts, three on each side.

Three of the poles in the rack were bolted together as one unit with an 8-in. x 10-in. x 25-ft. timber. Jacks were placed under this timber and sufficient pressure applied to remove all perpendicular strain on all poles in the unit. The timber was then securely shored up to hold it in this position. The decayed butts of the poles were cut off 6 in. above the ground line, the butts removed and the hole enlarged sufficiently to take the concrete bases. These were lowered into the holes, using the cut-off poles in the unit for support. The bases were then leveled and the earth filled in and tamped around them. The malleable iron castings were bolted to the concrete bases and the poles moved into place between them and fastened with the "U" bolts. All metal parts had been previously painted with red lead and were finally coated with black asphaltum. The process of remounting the rack was carried out under the supervision of Harry Hill, line foreman of the New Britain division of the Connecticut Company.

It is estimated by the company that $335 was saved by reclaiming the rack rather than replacing the poles and installing new arms and insulators. As a sound piece of timber above ground has a period of life three times greater than a similar piece of timber in the ground, it is thought that the reclaimed poles will last 25 years longer.



At Left, Decayed Butts of Old Poles Being Removed. At Right, Concrete Base Installed Under Old Poles



At Left, Shoring Up Poles After Old Butts Had Been Cut Off. In Center, Lowering New Concrete Base Into Position. At Right, Malleable Iron Castings Were Used to Hold Poles in Place

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The Readers' Forum

The Renewal Parts Question

THE CAPITAL TRACTION COMPANY

WASHINGTON, D. C., Jan. 2, 1926.

To the Editor:

The writer has been much interested in the articles in ELECTRIC RAILWAY JOURNAL recently on the cost of renewal parts for electric railways. An investigation of this subject shows that there are fewer operating companies manufacturing renewal parts today than there were two or three years ago. The reason for this must be either that they are able to purchase these articles cheaper or that they are able to purchase better articles than they can manufacture in their own shops.

The question of the cost of renewal parts manufactured by an operating company depends on what is charged as part of the cost; by that I mean what overhead charge is included in the cost. I have heard this subject discussed many times, but very few agree on what should be included as a proper charge. The overhead cost is there and is paid for somewhere, whether it is included in the cost or not. It must be reckoned with in determining the cost of renewal parts manufactured in operating shops as compared with costs of similar articles purchased outside. If no charge, or an incorrect charge, is made for overhead expenses a true cost is not obtained and the comparison is not correct.

It has been stated that a well-organized shop can manufacture repair parts to some extent at a profit because the same men and tools used for repair work can be used to manufacture repair parts when work is slack. My answer to that would be that it is not a well-organized shop, for there should be no slack time. There might be times when the force employed might not be able to keep the work up due to unusual conditions, but the number of employees should not be so large that it is necessary to bring in outside work to keep them busy. The regular force can be better employed on maintenance work than on the manufacture of repair parts.

A question which in my opinion is of more importance than the cost is, can you make the renewal parts as good as the manufacturers who make them in large quantities? The large manufacturer has facilities for determining the quality of his raw material that is a most important factor. He is able to buy this material on specification. His men become experts as they are constantly working on the same kind of work and do not have to shift from one class of work to another. The facilities for inspecting the work are better because there is more of it to do and it pays to assign inspectors to see that it is produced accurately. Therefore the loss from rejections is less.

The life, then, of the material should be longer. After all, that is what we are after. The cost of an article should be based on how long it will last and give good results, not on what the initial cost may be. Material purchased from a responsible manufacturer carries his guarantee. If the material does not give satisfactory service, he is ready to replace it or make an adjustment that protects the operating company from loss. On the other hand, if similar material manufactured by the operating company is not satisfactory, there is no adjustment and the loss must be taken care of by the company itself. When repair parts are manufactured by the operating company their performance should be compared with the performance of similar material purchased outside before deciding which is cheaper. No matter how cheap an article may be, if it causes delays in service due to failure it becomes an expensive article.

The extent to which the operating companies will enter into renewal parts manufacture depends on what the manufacturer has to offer them in delivery, price and quality. The question of delivery is important, for if the operator can depend on getting good material delivered in a reasonable time he is not compelled to carry such a large stock on hand and is thereby enabled to reduce the amount carried in his stock account.

The amount of material carried in the storeroom of an electric railway is large and represents a large amount of money which is not revenue producing. It is therefore necessary to keep the amount on hand as small as possible. Close co-operation between the purchasing department and the engineering department will materially assist in procuring better material and also tend to reduce the amount of material carried in stock. The question of importance after all is, can you manufacture cheaper than you can buy? Before deciding this question, a careful study should be made to determine the cost and performance of the material in question.

H. E. Jordan in his article in the JOURNAL of Oct. 10, 1925, said: "This question deserves greater consideration by railway companies." That, in my opinion, is the answer to the argument, for if the question is given sufficient consideration it will be found that, when quality is considered, it is cheaper to buy than to manufacture.

R. H. DALGLEISH,
Chief Engineer.

Chicago Has Record Holiday Traffic

IF THE number of street car rides is any indication of the amount of Christmas shopping, Chicago merchants must have had the biggest business in their history this year, according to Chicago Surface Lines officials. All previous records for peak loads were left far behind and the company used more than 99 per cent of its equipment in an effort to meet demands. On some days all but seven of the 3,539 cars owned, or 99.8 per cent, have been on the streets.

The highest record in riding was made on Saturday, Dec. 19, when there were 4,962,313 riders, the greatest number ever carried in one day. November showed an increase of more than 6,000,000 rides as compared with November, 1924. There was a steady increase in riding every month since June, but the shopping season brought tremendous peak loads. There were more rides on Oct. 31 than ever before in one day, but that record was broken three days later.

The rerouting of street cars and prohibition of left-hand turns of automobiles in the Loop last year, the elimination of parking on the Loop sections of Van Buren, Wabash, Lake and Franklin Streets and other traffic reforms have proved of great benefit in handling the crowds, G. A. Richardson, vice-president of the Surface Lines, said. Without these improvements, he declared, street congestion would have choked every important traffic lane.

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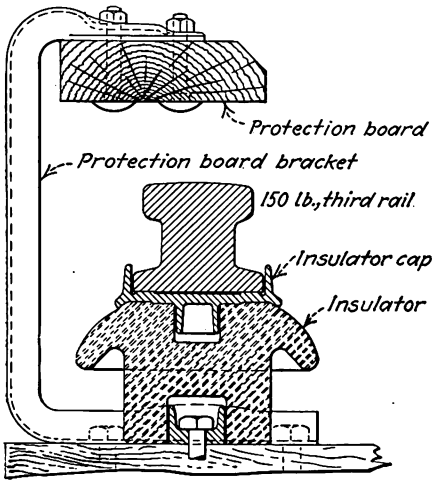
Equipment Maintenance Notes

Third Rail Insulator Maintenance

BY G. H. MCKELWAY
Engineer of Distribution Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

ON ALL of the more recently equipped lines of the New York Rapid Transit Corporation the third rail is of 150-lb. section and is supported on porcelain third rail insulators resting directly on the ties. These insulators are prevented from moving horizontally by means of cup



Method of Supporting 150-Lb. Third Rail

castings lagged to the ties and projecting up into holes in the bases of the insulators.

The rail rests directly on a pronged cap with a projection on its bottom which fits into a similar hole in the top of the insulator, so as to keep the cap in place. At one time considerable trouble occurred due to the porcelain insulators splitting. Investigation showed that the splitting was caused by the rusting of the boss on the bottom of the cap.

Accumulation of rust on this lug increased its size so that not only was it impossible to separate the cap from the insulator, but the wedging force of the rust first caused hair-line cracks in the porcelain and eventually split it into pieces.

Owing to the fear that a serious accident would occur due to the breaking of large pieces of porcelain off of the insulators when they were installed on the elevated lines, and their resultant falling into the street and striking people passing by, it was decided to examine all insulators of that type which were installed on the elevated structures. During this examination each insulator was removed and the cap taken off. In many cases the lug on the cap had swelled so much from the rust that it was impossible to pry it out of the porcelain, and the latter was broken in the attempt.

Not only were many of the bosses on the caps found to be so badly rusted that it was not safe to put them back but, on close inspection, many of the porcelain insulators which seemed at first sight to be uninjured were found, after careful wiping off, to have developed hair-line cracks. These insulators were discarded.

When installing new insulators and caps as well as when replacing those which were uninjured, the boss and hole were given a thorough application of a heavy graphite grease. This, it is believed, will decrease rusting of the lugs. This careful inspection of the insulators has been made not only on the elevated lines but in damp portions of the subways as well.

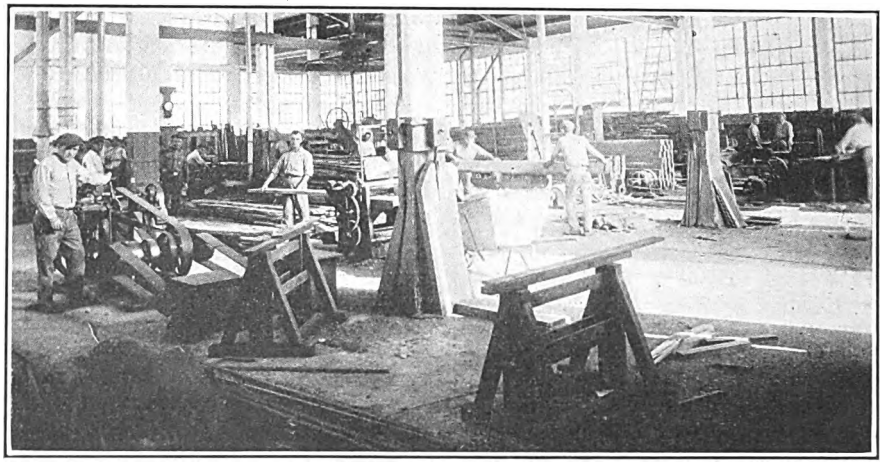
From Log to Finished Car Parts

The Woodworking Machinery in the Shops of the Havana Electric Railway, Light & Power Company Provides for Taking Native Wood as Delivered in Logs and Making the Finished Parts for Car Body Repairs

BY OTTO GOTTSCHALK
Engineer of Railway Equipment Department, Havana Electric Railway, Light & Power Company, Havana, Cuba

FOR maintenance repairs to car bodies and also for new construction, the Havana Electric Railway, Light & Power Company, Havana, Cuba, has found it economical to use native Cuban hard wood with the exception of pine which is imported from the United States in board lengths. The native wood is delivered to the railway in logs, some of which are as much as 40 ft. long and 50 in. in diameter. The railway company's equipment thus contains machinery required to rip these logs into slabs and timber framing of various dimensions as well as that necessary for finishing the various parts required.

In order to provide for carrying out this work in an economical manner, a modern fireproof building has been constructed for the large band-saw which is used to rip the logs. Formerly this equipment was located in an old wood-frame building and the machinery was driven by belts



New Woodworking Department of the Havana Electric Railway, Light & Power Company Has Increased Production 33 per Cent

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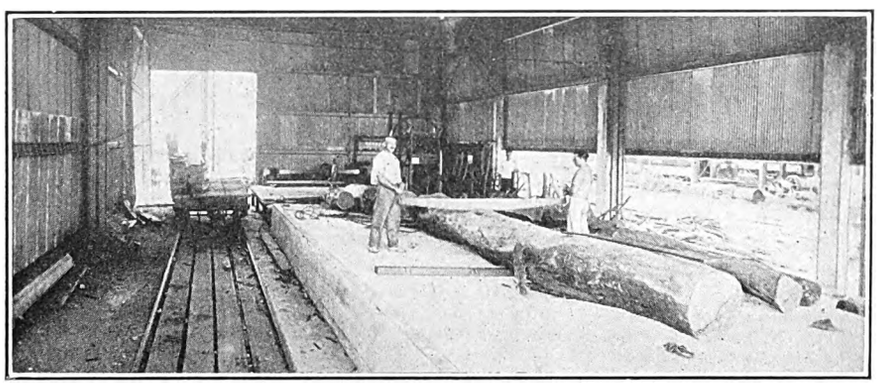
through a long and complicated system of power transmissions. A single motor was used for the operation. It was desirable to decrease the fire hazard and also to increase the output without a great expenditure of money, so a modern fireproof building was constructed for the smaller woodworking machinery and a separate corrugated iron building was constructed for preparing the rough timbers. This latter building is located conveniently to the log storage and has a standard gage track running through it. The bandsaw is located at one end of this building and a large pit with foundation for the saw has been constructed of concrete. This provides a firm base for the machines and eliminates vibration, which is objectionable. The bandsaw is driven by a 50-hp. motor through a 12-in. belt. The motor is located in the pit under the loading platform in the building, so that no space is lost on the floor. A compartment has been constructed in the pit, into which sawdust falls, and an exhauster driven by a belt from the saw flywheel shaft deposits the dust into barrels outside the building.



Logs Are Sawed Into Convenient Sections in This Building Previous to Delivery to the Woodworking Section

Logs are brought into the building on flat cars and are rolled off to the concrete ramp, which has the same elevation as the floor of the flat car. On the ramp the logs are cut by hand into the desired lengths and are then rolled down to the saw carriage, clamped in position and fed to the saw. As the slabs are cut they drop to another platform, where they are loaded on flat cars and are hauled to the woodworking machines in the other building.

The building which houses the bandsaw has several features which result in labor saving. The ramp construction of the platform permits logs to be rolled easily to the carriage for sawing; a cable with an overhead trolley and differential hoist enables the workman to select any special log section that is desired without excessive handling. As a result of the improved equipment four men supply all labor for attending the saw where previously eight were required. The output has also been increased about 30 per cent.

The slabs and different special sections as they come from the bandsaw are taken to the building containing small woodworking machines. Each part is marked so that it can be cut into the particular shape desired, such as end sills, side sills, front sills, window posts, bulkheads and end posts.

The machinery in the woodworking department is arranged so that each section will pass from one machine to the next with a minimum amount of movement. Particular attention has also been given to the locating of machines so as to give ample space for handling large sections without difficulty. In general, each machine has an individual motor either direct connected or driven by a belt. In some cases, where two machines require a motor of the same horsepower and it appears that both machines will not be used at the same time, one motor has been used to drive both machines. In this case the machines are located so that the same belt lengths can be used.

A large motor-driven exhauster has been installed as a part of the equipment for the woodworking department. Each machine is served by a tube and there are also numerous tubes provided for floor sweep-ups. All sawdust and shavings are automatically deposited in a specially constructed car outside the building. The relocating of the machines and the installation of the new exhausters have increased the capacity of the woodworking department about 33 per cent with no additional labor.

Providing Sockets or Sleeves for Cables

DIFFICULTY experienced in getting permanent connection with soldered terminals or sockets which are used with stranded wire has led the Bridgeport Brass Company to make a survey of practices of various railways in connection with its Phono Hi-Strength wire. Information developed in this manner, together with data obtained in a socketing test of samples, has led the manufacturer to recommend the following:

Sockets.—The sockets should be of the open-end or sleeve type, as it is impossible properly to fan and clean the strands if the closed-end type is used. The open end also makes it easier to determine if the soldering is done properly. For cables ½ in. in actual diameter and under the sleeves should have a conical chamber at least 3¼ in. deep with a taper of about ¼ in. per inch. For cables from ½ to ¾ in. actual diameter a conical chamber at least 4 in. deep with the same taper as given above is desirable. Sockets may be malleable iron, steel or bronze, but where corrosion is an important factor it is of course better to use bronze fittings.

Preparation of Cable.—The end of the cable should be carefully bound with light brass or copper wire pushed through the socket. It should then be bound again at a point which, when pulled back into the socket, will leave the ends of the cable extending approximately ⅛ in. above the top of the opening. The end binding should then be removed and the wires fanned out. The wires should then be cleaned by hand with emery cloth, or, better, by dipping in a 50 per cent water solution of nitric acid. If the nitric acid dip is used care must be taken not to dip the cable quite up to the binding or else the acid may feed into the cable due to capillary action. The cable must be thoroughly washed after the nitric acid dip and then dipped in a zinc chloride soldering flux. After the flux has thoroughly dried the wires should be tinned by dipping them in the molten socketing mixture. Any moisture on the wires when dipped in the metal will cause it to boil and blow. It is best for the operator to wear goggles and gloves in the operation.

Flux.—Zinc chloride flux can be made by adding more zinc than can be dissolved to hydrochloric acid or what is commercially known as muriatic acid. It is well to keep a

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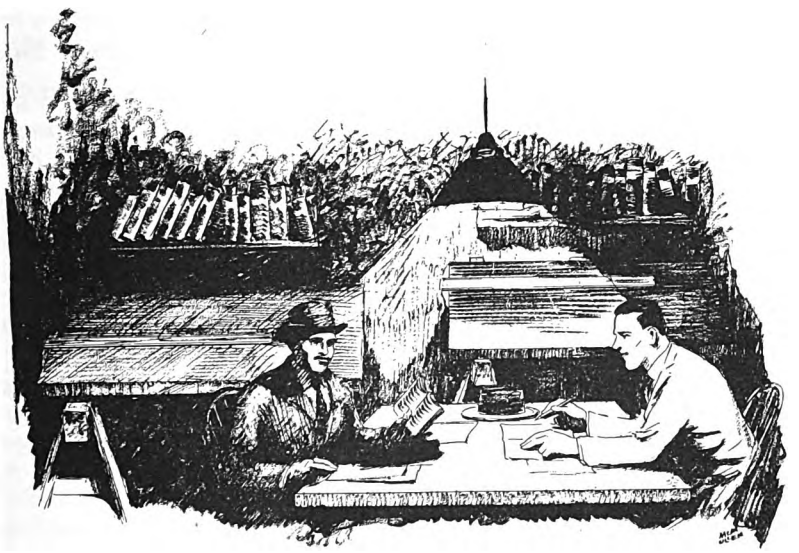
Dick Prescott Works Overtime

And Learns Something About Cars



FOR several days following his talks with the shop foremen regarding the work of the new engineering department, Dick Prescott, engineer of equipment of the Consolidated Railway & Light Company, was busy putting some of his plans into action. He saw so many opportunities of taking detail off the hands of various foremen and at the same time laying out definite standards and practices to replace the old rule-of-thumb methods that he was impatient to get to work as quickly as possible. This filled so full the days immediately following that he and Steve White, the carpenter shop foreman, had little time to get together and consequently they spent several evenings in the new engineering office making the study of car repair practice that they had both agreed to do the day following their return from their inspection trip.

Steve had managed to make up an inventory of the several different major items of equipment in service on the property. The figures summed up as follows:

City passenger cars	320
Different types included	11
Types of trucks	9
Types of motors	10
Wheel sizes	3

"Gee, that's some mess," said Dick when they had summarized the figures in this form.

"I'll say it is," agreed Steve.

"How do those cars run in weight?" asked Dick, starting on a fresh sheet of paper.

"Well, I didn't get a chance to get each type on a scale, but I've got the figures on some of them," said Steve, consulting the worn notebook in front of him. "The old battleships—that's the group of 40 cars in the 200 series—go about 48,000 lb. The twenty bowling alleys run around 46,000 and the six rebuilds—those are the ones we rebuilt after the fire—weigh about 49,500. Then the maximum tractions scale 44,000 and the big turtlebacks average 45,500."

Steve paused a moment to check back the figures in his book.

"Oh, yes," he continued, "here's the center-entrance cars. They're on two different trucks. Twelve of them weigh 42,000 lb. each and the other nine are 43,500. Then I've got the new cars. There's fifteen of them and they average 32,000 lb."

"How does the seating capacity on the new cars compare with the battleships?" asked Dick.

"Four seats less."

"How old are the big fellows?"

"Let's see, I think about 22 years."

"What do you suppose is the relative maintenance cost on those two groups?"

"Gosh, that's the whole trouble. We don't have the figures in shape so they tell the story. If we did we wouldn't be spending money right now to patch them up."

"Well, that's our job now; to get some way of estimating what the costs are on each group of equipment," said Dick.

"All right," replied Steve, "let's see what we can do." He laid down his notebook and pulled a pad of paper in front of him.

small piece of zinc in the solution to be sure that there is no appreciable amount of free acid. Any other non-corrosive flux recommended for use with tin-lead solders may be used provided it is found that a satisfactory union between the solder and the wire is obtained.

Socketing Mixture.—The mixture used for pouring into the socket and also for tinning the wires should be made up of two parts of tin and one part lead. This mixture melts at about 360 deg. F. and can be poured easily at temperatures from 370 to 390 deg. F. The temperature of the metal should not be over 410 deg. F. when the wires are dipped for tinning or when it is poured into the socket. If it is used at a higher temperature there will always be danger of annealing the wire.

Making the Socket. — After the wires have been tinned and prepared the cable should be drawn back into the socket so that the ends project slightly above the end of the conical opening. Care must be taken to have the cable leave the socket straight and in line with the axis of the socket, otherwise the stresses will not be uniformly distributed on the wires. It is also important not to have any of the fanned wires in contact with the sides of the socket, otherwise the solder will not surround the wire completely and poor holding power will result. All parts of the cable and socket which will come in contact with the molten metal when it is poured into the socket should be thoroughly dried, but it is sometimes desirable to wrap a wet piece of waste or cloth around the small end of the socket to chill the solder more quickly. The socketing mixture should be poured into the socket slowly and at as low a temperature as can be used and still obtain a good sound casting. It is usually well to hold the socket in a vise and neither the cable nor the socket should be moved until the solder has thoroughly set. After this the socket may be quenched in water to cool it rapidly.

Trolley Wheel Bushing Press*

FOR forcing bushings in and out of trolley wheels a pneumatically operated press has been designed and constructed in the shops of the

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

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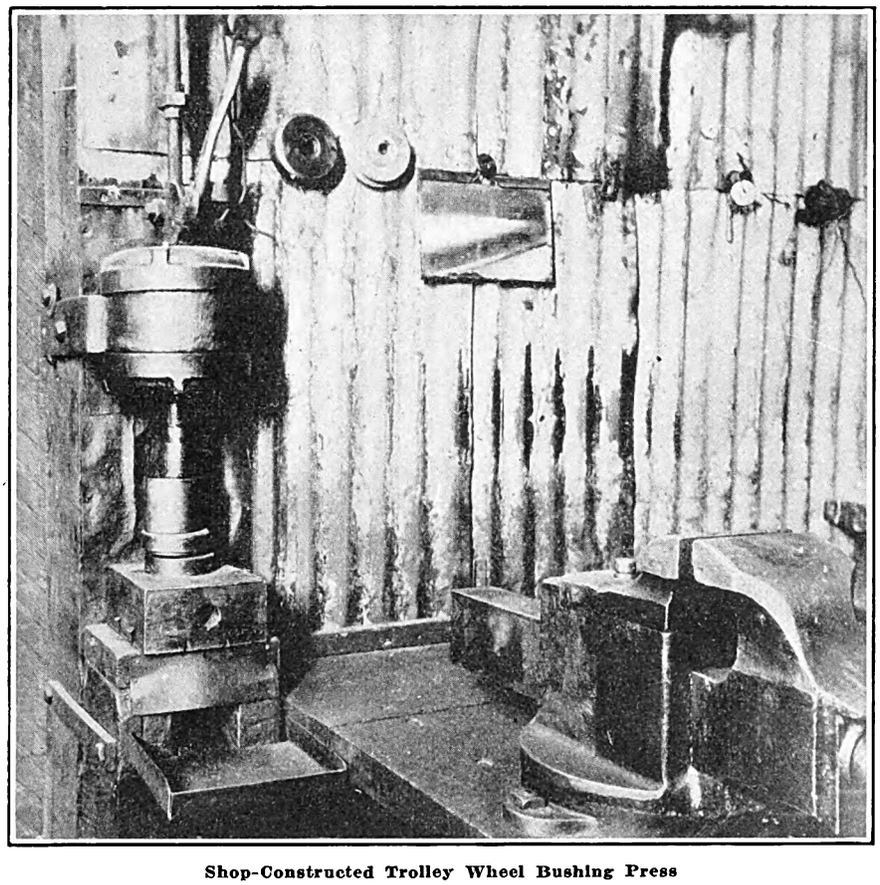

Shop-Constructed Trolley Wheel Bushing Press

Denver Tramway, Denver, Col. The construction consists of a piece of 6-in. pipe with two pipe caps and a piston and plunger. The whole device is mounted on the wall near the workmen's bench. An anvil necessary for convenience of the workmen is located underneath and a three-way air valve is provided for control of the press.

Car Cleaning Methods in Boston

CLEANING more than 2,000 cars for the year 1924 cost the Boston Elevated Railway slightly more than $477,000. The entire outside surface of each car in service, including the glass, is cleaned daily with a soft mop. Vestibule glass is cleaned on both sides and the inside of all windows is gone over with a damp chamois or cloth to remove streaks and spots.

After every storm all surface cars are washed thoroughly with clean water as the car surface becomes streaked from dirt washed from the roof. Outdoor storage is used quite extensively in Boston. This renders more difficult the problem of keeping cars clean in winter since little or no water can be used. Daily, generally at night, the floor of the car is swept clean, a solution of water and disinfectant being used to lay the dust and sterilize the interior. After the car is swept and the dust has settled, it is thoroughly dusted and the lamps, hand straps, window sills, and register glass are wiped with a dry towel.

At intervals of from one to two months, according to the condition of the car, both inside and out are given a thorough cleaning by using in addition to water some cleansing compound that will effectively remove all stains without injuring the paint or scratching the glass.

Car cleaning in Boston would be much simplified if all cars could be treated alike, but as the service on different lines is quite different cleaning requirements are quite varied. Cars running through paved city sections present a different problem from those running where the streets are macadamized. Also cars stored under cover require much less work than those stored in the open. The problem of keeping cars clean in rainy weather is different from that in fair weather, and cars which run in subways or tunnels are harder to keep clean than those which do not. Underground, the dry dust with its fine particles of iron which come from brakeshoes is kept in motion continually by the rapid movement of trains. An accumulation of this dust on the cars in a wet condition becomes iron oxide or rust, which is one of the most difficult things to remove from glass and painted surfaces.

Overcoming Trolley Breaks Due to Severe Temperature*

CONDITIONS in El Paso, Tex., are such as to render the maintenance of trolley wire on the lines of the El Paso Electric Railway a serious problem. Extremely hot days followed by cold nights cause an expansion and contraction that is excessive and decidedly harmful to the wire. To overcome troubles from trolley wire breaks, the company has installed Phono-Electric wire over special work in the downtown sections. This is inspected on a regular maintenance schedule and since its installation a very marked improvement has resulted in the number of trolley breaks. The following figures show the results obtained. During 1921, 239 breaks; 1922, 193 breaks; 1923, 102 breaks; 1924, 33 breaks; 1925, 15 breaks for first six months of operation.

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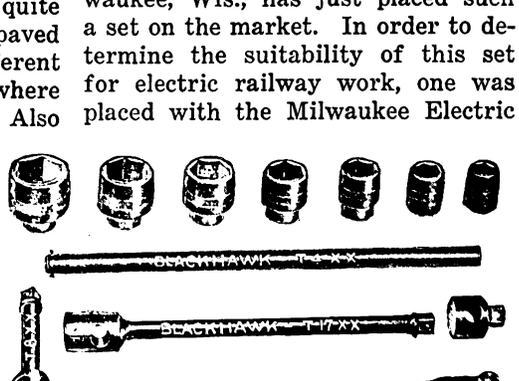
New Equipment Available

Heavy-Duty Quick-Set Detachable Wrench Set

DESIGNED to fill an urgent need of electric railway shops for a heavy-duty wrench set, the Blackhawk Manufacturing Company, Milwaukee, Wis., has just placed such a set on the market. In order to determine the suitability of this set for electric railway work, one was placed with the Milwaukee Electric



Extra-Heavy-Duty, Quick-Detachable Wrench Set

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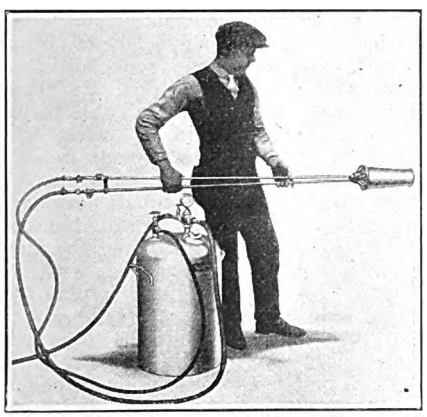
Railway & Light Company for a test of one year. This set has been used daily putting in motor studs with a 6-ft. extension bar on the ratchet wrench. Force has been exerted by the weight and pull of two men. This set has given satisfactory service and no replacements have been found necessary during the trial. An accompanying illustration shows the new heavy-duty set with quick detachable wrenches.

Atomizing Type Oil Burner

DESIGNED to give maximum combustion and great heat quickly, an atomizing type of oil burner and preheater has been brought out by the Alexander Milburn Company, Baltimore, Md. The cheapest grade of crude fuel, kerosene oil or distillate and compressed air under pressure varying from 50 to 100 lb. is used. In addition to furnishing a direct supply to the burner, the compressed air also maintains pressure in the oil storage tanks. This creates a greater velocity in the oil feed line and insures a positive and uniform flow.



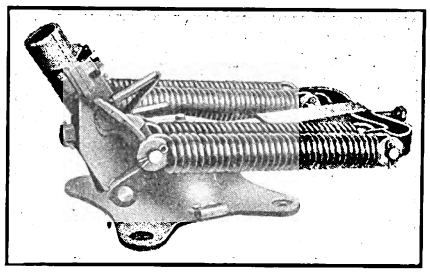
New Atomizing Type of Oil Burner and Preheater

The flow of both air and oil is through straight-line orifices unhindered by coils or staggered passages. The oil under pressure enters the atomizing chamber at right angles to it and in an annular form. The compressed air flows directly through the center, striking the filament of oil and atomizing it. There is no siphoning effect of either oil or air. Immediately upon opening the valves, the gas at the burner can be ignited and work can be started.

This burner is particularly convenient for use in preheating castings for welding in electric railway shops. Preheating is now considered quite essential for large castings in order to neutralize expansion and contraction strains and to effect economy of gas. Without preheating, complicated castings are liable to develop new breaks at points remote from the weld when they are again placed in service.

Tapered Roller Bearing Trolley Base

FOLLOWING nearly four years trial on a selected number of railway properties a trolley base incorporating the tapered roller bearing



Tapered Roller Bearing Insures Great Durability and Sensitiveness

features is now being offered to the market by the R. D. Nuttall Company, Pittsburgh, Pa. This is now designated as U. S. No. 20-A and is standard equipment with the company. The main forward step taken in the design of this base is the use in the swivel of roller bearings with hardened raceways and a suitable means of adjustment.

A trolley base must withstand a heavy cocking load due to the weight of the pole, harp and wheel and to the wire pressure. These pole loads cause the swivel to tip to an extent depending on bearing clearances and wear. The result is that in bases employing a center pin, rollers and outer raceway the rollers bear at their upper ends on the side of the trolley base opposite the pole and at their lower ends on the pole side. Between these two points the rollers must be slightly cocked and crosswise of the raceway, each roller being in a slightly different position, depending on its location around the swivel.

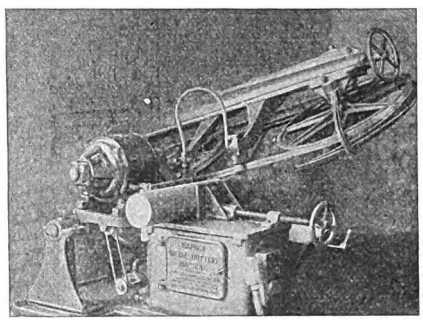
With the new construction this localized end pressure is distributed over the entire surface of the tapered roller by the use of two tapered roller bearings located one at the top and one at the bottom, since the pressure at the top and the bottom of the swivel is practically perpendicular to the rollers. The cocking tendency is still present, but the perpendicular pressure just mentioned is produced and the tendency to twist is minimized by closer tolerances which are possible with these adjustable bearings.

More even distribution of pressure over the area of the roller results in less pressure per unit of area than is obtained with the longer rollers now commonly employed, either loose or assembled in a cage. A further advantage is that the base actually hangs on the roller bearings, as compared with the usual arrangement in which a large amount of the weight is supported on the center pin with consequent friction and loss of freedom to the swivel.

Arm Feeds Metal Cutting Saw Into Work

BY USING a horizontal arm instead of a vertical one on a bandsaw, a cutting head is produced which, by its own weight, feeds the saw into the work instead of the usual method of feeding the work into the saw. This is a feature of the new metal cutting bandsaw produced by the Metal Saw & Machine Company, Inc., Springfield, Mass.

The weight of the horizontal cutting head is counterbalanced by a powerful spring which gives an automatically variable feed pressure to take care of differences in hardness in the piece of metal being sawed. This construction saves the bandsaw blade and gives a straight cut regardless of variations in the stock. With the positive feed of the vertical type of bandsaw commonly used, the stock is forced into the saw and results in crooked cutting, stripped teeth and broken blades. With the new construction, constant attention



Horizontal Napier Bandsaw for Metal Cutting

by the operator is unnecessary after the material is secured firmly.

The new machine is driven by a Westinghouse motor, which is regulated to give a particularly high speed. This is possible since the blade travels in the cutting direction only and the pressure adjustment gives a smooth, even movement.

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American Association News

Metropolitan Section Devotes January Meeting to Bearings

Design, Lubrication and Maintenance of Electric Railway, Motor and Car Building Received Active Consideration at the Jan. 8 Meeting Held in New York

MOST of the secrets about the bearings of electric motors and car journals were aired at the meeting of the Metropolitan Section of the American Electric Railway Association held in New York on the evening of Jan. 8. Before one of the largest attendances in the brief life of the Metropolitan Section, the manufacturers told of the practices and the solutions of problems that have helped to develop the modern railway motors. A carefully prepared paper by M. Guynes, of the railway motor engineering department of the General Electric Company, is abstracted elsewhere in this issue. It is filled with the technique and the detail adhered to in the manufacturing process and is full of pertinent information and practical suggestions that visualize to the maintenance engineer the importance of good lubrication and good maintenance of bearings, to avoid their rapid wear. One workman called a bearing a heat generator. This is true, and the efforts of the manufacturer and the maintenance engineer must be devoted to make it a poor generator. A number of lantern slides helped to visualize the important points.

Mr. Guynes' paper was followed by an excellent presentation of the same subject by J. F. Dean, of the engineering department of the Westinghouse Electric & Manufacturing Company. This paper was also filled with information of interest and many practical suggestions. It is also abstracted elsewhere in this issue.

The January meeting was called to order at 8 o'clock by President J. W. Hulme, having been preceded by a Dutch-treat dinner at Keene's English Chop House. On account of the length of the meeting only the treasurer's report was given, indicating that there was $1,337 on hand and that the membership committee had increased the number to 1,122 members, an increase of 47 in the past month.

A telegram from C. E. Morgan, who was in Cleveland attending the exhibit committee meeting, sent the best wishes of the committee, including J. W. Welsh, Morris Buck, F. C. J. Dell.

Following the presentation of the two papers on the design and maintenance of bearings, Joseph F. Lamb, staff engineer of the Texas Company, discussed the papers, saying that the experience of the Texas Company has shown that the best car oils were manufactured from high grade steam cylinder stock, made up in seasonal grades to compensate for the great differences in temperature. Mr. Lamb does not agree that it is best for motor bearings to receive free oil when worn. While this method may be satisfactory under ideal mechanical conditions, the facts are that the oils used and the oiling system used must operate satisfactorily under other than ideal conditions. The down feed type of oiling frequently results in flooding the armatures, thus doing great harm.

Emphasis was laid on the statements of the two manufacturers' representatives that a long fiber all wool waste has the characteristics most desirable in capillarity and resiliency. There are in use grades of waste containing mixtures of graphite, talc and mica which have proved to be disadvantageous because these fillers slip out and cause restriction and plugging of the opening between the oil and waste chambers in motors and prevent the bearings from receiving the proper supply of oil.

The Texas Company has achieved excellent results in the use of electrically heated, thermostatically controlled waste saturating tanks. With these tanks the waste saturation time is accomplished in four hours as against 120 hours in unheated tanks or tanks with uncontrolled heat.

While all of the ideas brought out have been good, Mr. Lamb stated that the best ideas find their value only in proper application and therefore his company is pleased to note the tendency among railway mechanical department officials to select more intelligent labor, take care of lubricating duties, and when this improvement becomes general, the results will justify the judgment of those responsible.

Alfred A. Green, of the Galena Signal Oil Company, outlined in an interesting manner the progress in the art of lubrication. Lubrication was first gained by old-fashioned grease cups. About 1900 the use of oil became recognized as a better practice. Also about that time the practice of putting long covers on the axles was started. The straight bronze bearings then gave way to the babbitt lined bearings and somewhat later the use of waste wick type of lubrication came into operation. Mr. Green laid great stress on the success that his company has had with lubrication on the mileage basis, the theory being that the right amount of lubrication is applied to bearings and the waste and promiscuous use of oil is avoided. Too much oil, he avers, does the bearing no good, and is apt to cause difficulties in other parts of the equipment.

The axle collar gave trouble, and the fiber collar came into use, giving some measure of success. Now the axle bearings are covered and lubricated with much greater success.

A film of oil in the bearing surface is all that can be used. Why use a barrel to supply the film, when a pint will do as well or better? To this point the manufacturers of bearings and oils held the center of the stage. D. D. Owenn, general foreman New York Rapid Transit, then told of some of the problems of the operator. Shortage of cars and consequent necessity of keeping the cars almost continuously in service, in his mind, practically prevent the use of many of the refinements possible in the manufacturing processes. Limited shop conditions do not allow the same grade of machine or workmanship possible in the original manufacture.

Mr. Owenn's road now has running 22 cars and 88 bearings, all journal brasses, using a cotton waste with a series of small springs placed in and behind the waste in order to hold it against the revolving axles. Mr. Owenn stated that it was impracticable to pack bearings properly in a truck while under a car, and that except in emergency cases, the waste is allowed to stay in the journal until periods of general overhauling, when the truck can be removed from the car and the motor bearings properly repacked with new waste. He reported little trouble from loose axle cap bolts. Occasionally one bolt will be broken, but the three other bolts hold the cap in place and the broken bolt is repaired upon inspection.

The practice recently adopted by the Metropolitan Section of passing blank cards around on which questions may be asked brought forth several interesting questions. One question asked in regard to the success of roller bearings brought forth the answer from Mr. Guynes that roller bearings had been used successfully in motor bearings. They could not be well applied to axle bearings and he said he could volunteer but little information in regard to the use of roller bearings in car journals, except that the Pennsylvania Railroad was now testing a number of roller bearings on some of its steam road equipment.

L. M. Clark, vice-president of the Railway Improvement Company, then gave a short discussion of the papers. He emphasized the use of good practices and the use of good oil in the lubrication of bearings, but stated that the responsibility for purchasing good oil did not end there, that it was necessary to have the oil 100 per cent clean when it reaches the bearing. One can hardly realize more difficult conditions

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for lubrication than under an electric car, which is subjected to the filth and dirt of city streets, the temperature changes and the water and snow often encountered. Another point to take into consideration is the fact that fresh oil should replace old oil that has done its duty. The mere fact that a space is filled with fluid does not necessarily mean that this is good oil. Railway motor bearings, as you know, are so designed that oil may pass out at both ends. This is not a total loss, as it is a protection to the flange end of the bearings against wear, and the open end against water; where oil comes out, it is rather difficult for water to get in.

Mr. Clark further stated that it is far easier to insure perfect contact of the waste with shafts or axles if the waste is located at the top of the bearing much more so than if it is carried in the side or below. When the oil is carried above the bearing, gravity is added to capillarity in supplying oil to the bearings.

With the top feed arrangement, the oil that is held in the waste naturally settles to the bottom, which is in direct contact with the shaft or axle. This is not the case with the side feed or underfeed type. The oil settles in the waste after the motor has been stopped and is at the greatest distance from the bearing at the time when the oil is needed and needed quickly, when the motor or car is first started after a long layover.

Engineers well advised in motor lubrication have questioned the advisability of applying oil at the top of the bearing, which, as you know, is the high pressure side. Experience, however, has demonstrated that no difficulties have been encountered on account of the waste opening being on the top. In fact, the opposite results predominate on account of the direct application of the oil to the shaft.

In summing up the situation, the motors and car journals should be put in first class mechanical condition. Old frames should be thoroughly annealed so as to normalize the internal stresses that have accrued through millions of vibratory shocks. This is best done after any necessary welding has been completed. Armature and axle bearing openings should be accurately rebored to the proper sizes and all precautions taken to see that these bearings are afterward accurately held in place. For good operation motors should be run as the manufacturers designed and built them. Limit bearing wear as closely as you can. The spreading of gear and pinion centers causes noisy operation and is detrimental to their life. The oil companies recommend good oil; use it and keep it clean.

Interspersed among some of these papers and following, a number of entertainment features were given by employees of the Interborough Rapid Transit Company. Prof. J. Haugher performed a number of tricks with a series of rings and later did some clever card tricks. Now you see it and then you don't. A banjo and song entertainment was given by Messrs. Sutherland and Readyoff.

Two other entertainment numbers were later given, one a dance by F. Heide and R. Haggerty, with H. Gilday at the piano, and then several songs by the well known tenor, E. Wager, were given, with H. Gilday at the piano.

The informal dinner before the meeting was attended by 89 members and the meeting following by 230. The next meeting will be held Feb. 5 and will be a series of motion picture films depicting the manufacturing processes of steel.

Bearing Life and Lubrication of Electric Railway Equipment*

By John S. Dean
Engineering Department, Westinghouse Electric & Manufacturing Company

QUITE frequently practical railway men in various parts of the country have asked this question: "Why is it that the armature bearings furnished by either the General Electric Company or the Westinghouse company have so much longer life and give better service than any other bearings we have ever used on our motors?" This may not be the experience of all operators. There is, however, enough evidence available to show that this is quite generally true. It may be satisfactorily explained by saying that the bearings are designed to have ample capacity and great care is given to all details. The materials used are of the best quality obtainable, the bearing shells are properly babbitted, the workmanship is of a high grade, backed by many years of experience and training. When the bearings are mounted they have a good tight fit in the housing and are accurately aligned. They are also constructed with minimum allowable radial and end clearances and are of the correct size.

*Paper delivered at meeting of the Metropolitan Section, American Electric Railway Association, Jan. 8, New York City.

Design of Armature Bearings

Modern railway motors are fitted with bronze bearing shells lined with $\frac{1}{16}$ in. thickness of tin base babbitt metal and are liberally designed to carry their load and resist the pounding and vibration to which they are subjected in service. A minimum size window with well-rounded edges and corners is provided through which oil is fed to the journal by means of a waste wick, the lower part of which rests in an oil chamber.

The bearing shell is made from a good grade of dense bronze, the composition of which is approximately 80 per cent copper, 10 per cent antimony and 10 per cent tin. The Brinell hardness of this alloy is around 70. The babbitt metal is made from a tin base alloy made from virgin metals and is similar in composition to the original Isaac Babbitt formula, which is 88.9 per cent tin, 7.4 per cent antimony and 3.7 per cent copper. The babbitting of bearing shells must be accomplished with great care. The shells must be carefully cleaned and then tinned. The use of an acid flux speeds up this work. The bearing shell must then be preheated before being assembled in the babbitting machine. The hot babbitt should be continuously stirred before pouring to keep the metals properly mixed. Use of babbitting pots with automatic temperature control insures a correct pouring temperature, which should range between 460 deg. and 480 deg. C.

All finished bearings that do not give a clear, bell-like tone when suspended and struck with a small hammer should be rebabbitted, as a dull, dead-like sound indicates that there are air pockets between the babbitt lining and the bearing shell, which are sure to cause trouble in operation. Good workmanship in the machining operation, press fitting, alignment and assembly are absolutely necessary. The clearances allowed in babbitt-lined bearings are those standards adopted by the American Electric Railway Engineering Association.

COMING MEETINGS
OF
Electric Railway and Allied Associations

***Jan. 20-21*—Central Electric Traffic Association, Miami Hotel, Dayton, Ohio.**

***Jan. 22-23*—Central Electric Railway Accountants' Association, Miami Hotel, Dayton, Ohio.**

***Jan. 26-29*—Society of Automotive Engineers, Annual Meeting, Detroit, Mich.**

***Jan. 27*—New York Electric Railway Association, Hotel Commodore, New York, N. Y.**

***Jan. 28-29*—Central Electric Railway Association, Lincoln Hotel, Indianapolis, Ind.**

Feb. 5—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8 p.m.

***Feb. 11*—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.**

***Feb. 18*—American Society Civil Engineers, American Society Mechanical Engineers, American Institute Electrical Engineers, and American Institute Mining and Metallurgical Engineers, joint meeting, United Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8:15 p.m. Subject: "The Effect of the Diesel Electric Engine on Heavy Electrification."**

***Feb. 24-26*—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.**

***April 13-16*—Southwestern Public Service Association, Galveston, Tex.**

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In the Westinghouse plant the journals on new armature shafts are ground to exact size on a Norton grinding machine. This is not practical in repair shops, as the shaft would have to be removed from the armature. Armature shafts should not be allowed to run in service if worn tapered more than 0.005 in. If the wear is greater than this the shaft should be trued up to a maximum size or reduced in definite steps of $\frac{1}{32}$ in. on the diameter, so as to use standard under-size bearings.

When journals have reached their scrapping limit it is the practice of some operators to restore them by the use of sleeves made from Shelby steel tubing, while others build them up by welding. Our experience indicates that shafts made from heat-treated or special alloy steels should not be welded.

Armature and Axle Bearing Life

Answers to a questionnaire sent out by the American Electric Railway Engineering Association several years showed that the minimum armature bearing life reported was 15,000 miles and the maximum armature bearing life was 200,000 miles, while the average of all reports indicated 80,000 miles. Reports have been obtained elsewhere of as high as 375,000 miles, which is probably the upper limit that has been obtained. It is probably reasonable to assume that the average life of armature bearings should be between 80,000 and 90,000 miles.

From the same questionnaire it was determined that axle bearings had a minimum life of 2,000 miles and a maximum life of 150,000 miles, averaging 55,000 miles. The average life can thus be generally assumed to be between 50,000 and 55,000 miles for axle bearings.

Maintenance and Inspection of Railway Motor Bearings

A careful inspection was made on a street railway recently and the data obtained were segregated into the maintenance records in two different carhouses. This inspection covered 88 motors over a period of thirteen months. The inspection and maintenance methods, including lubrication practices, at carhouse A were far superior to those in carhouse B, as was indicated by the results. Carhouse A reported 0.002 in. wear per 5,000 miles, whereas carhouse B reported 0.0095 in. wear per 5,000 car-miles. The bearing wear at carhouse B was thus some 62 per cent greater than at carhouse A and showed conclusively that too much stress cannot be laid upon the importance of regular and systematic inspection of equipment.

Oil, being the medium of lubrication, is of utmost importance. It is recommended that railway operators be guided by the suppliers of oil. Do business with a reliable and a dependable company. Guaranteed mileage contracts should be avoided, as they sometimes work out to be economically wrong. Temperature affects the oiling of motors and therefore the proper grade for summer and winter use should be used. A definite system and schedule of oil changes should be adopted and followed religiously. If the oil is too heavy, rapid wear of the bearings results, although they may not get overheated.

A suitable and convenient storage room should be provided and equipped with modern appliances for the handling and storing of all oil stock and lubricating material. Long strand wool waste, the strands varying from $\frac{1}{16}$ in. to $\frac{1}{8}$ in., should be used. Experience shows that such wool yarn when properly saturated will not glaze and will feed plenty of oil to the bearings. Further, it retains its springiness, which keeps the waste wick against the journal when once properly packed. The difference in price between low grade waste and a high grade of wool waste is about 15 cents per pound, and as the average bearing takes only a pound of dry waste to 4 lb. of oil the difference is practically 15 cents a bearing, whether a good grade of waste or a poor one is used. A bad bearing may cause maintenance difficulties in excess of $75 if the armature must be rewound. Experience of the Westinghouse company has found that the most satisfactory way of packing a motor bearing is to make up a wick of long wool yarn, which is placed in the oil chamber, so that it will extend from the bottom to the top of the housing. This wick should be made the maximum size that can readily be put in place to insure a good oil feed. After the wick is in place, fill the remaining part of the housing with bunches of waste packed in behind the wick, using great care to spread the wick at the bearing window. In making up the wick and in packing the bearing extreme care should be taken to use only clean and well-saturated waste. Ordinarily bearings should be repacked at least twice a year. The most suitable time for doing this work is when changing the grade of oil, due to change in seasonal temperature.

Definite oiling schedules should be adopted at periods equaling about every 1,000 miles of service. Maintain the oil at proper levels, determined by means of a gage, after receiving the advice of the manufacturers of the motors. Tests show that under similar conditions the flow of oil for a $1\frac{1}{4}$-in. lift is approximately five times more than at a 3-in. lift. The maximum possible lift for wool waste and car oil is 5 in. and the maximum lift for practical oil supply is 3 in.

Car journal bearings also should be carefully packed and lubricated. When the car is overhauled and the bearing is to be repacked the housing or journal box should be thoroughly cleaned out. A wick of waste is packed at the rear end of the box to lubricate the rear journal fillet and to keep out dust and water. Pack the box with a continuous bunch of waste, forcing it in place so that it makes a good contact with the underside of the journal. Care should be taken to see that all waste should be kept below the center line of the journal. See that no strands of waste are left hanging outside of the box after the cover is closed, as they will tend to drain the oil from the journal box. When properly saturated waste is used in packing the journal box; no free oil should be added.

Men responsible for the oiling of equipment should be trained. Simple typed instructions on packing and bearing oiling should be placed in the hands of oilers. These instructions should be supplemented by short talks to the men in charge of this work, explaining the fundamental principles of bearing lubrication, the advantages of good lubricating methods and the troubles that result from poor methods.

Capillary-Vacuum Oilers

The Railway Improvement Company has recently put on the market an oiler which works on the capillary-vacuum principle. It has been applied to a large number of older type of railway motor bearings, which originally used grease lubrication. Reports indicate that this device has greatly improved the operation of these bearings. It is claimed for this oiler that bearing costs can be reduced 50 per cent by eliminating the dirt, grit and other foreign substances which are constantly finding their way into the bearing housing, clog the packing waste and help to grind out the bearings.

In discussing the question of oiling and lubrication, similar care should be given to all other parts of the equipment.

Regular and systematic lubrication of the above details will not only result in a smooth running car but will produce a longer life, less vibration and noise and a consequent reduction of general maintenance expense.

Federal Bill Limiting Exemption Now Given on Interest from Municipal Bonds

IN THE discussion on the present federal income tax bill before the finance committee of the United States Senate, a plea was recently presented by Philip H. Gadsden of Philadelphia for an amendment to Section 213 of the revenue act of June 2, 1924. This is the section relating to the exemption given under the law to interest received on bonds of a state and its political subdivisions. The arguments were presented in behalf of the American Electric Railway Association, the American Gas Association, and the National Electric Light Association. Mr. Gadsden proposed that the present exemption of the interest on these bonds should not apply to obligations issued since Jan. 1, 1925, "in payment for or to be used in paying for the construction, acquisition, operation or maintenance of any utility, which bonds, warrants or obligations do not constitute general indebtedness of issuer, but are payable out of the revenues of such utility or otherwise than by general taxation, and from the rents, dividends, securities or transaction of any business carried on for gain or profit and income derived from any source whatever."

According to the speaker, Congress has the constitutional power to make a distinction between the governmental activities of a state or city and its business activities when it enters the fields of public utility and ownership. This position was justified by Mr. Gadsden in a series of quotations from decisions of the courts of last resort of a number of states and by the Federal Supreme Court.

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The argument was made that unless this change is made in the federal income tax law, at least two classes of the community suffer serious disadvantage. One is the rural dweller, whose utility service is nearly always supplied by a private company, since practically no municipally owned electric plants extend their service lines into the country. Through his payment of rates he assists in the support of the federal government, while the user of service from a municipally owned plant is free of this burden. The other discrimination comes between the dwellers in cities served by a private utility and in those where the utility is owned and operated by the municipality. In the latter case, the car rider is relieved from contributing some part of his car fare to the federal government, while the patrons of electric railways where the utility is privately owned must pay a rate of fare which includes their proportionate share of the federal tax. The point is made that in these days of friendly but keen competition between cities in the same territory for industries, such a different street railway fare or gas or electric rate might confer a distinct advantage on the city which owns its own utility. Consequently it constitutes a discrimination on the part of the federal government against all the other cities which do not.

The conclusions of the argument are summarized by Mr. Gadsden as follows:

1. The ownership and operation of public utilities by a municipality or other governmental agency are not governmental functions.
2. When a municipality or other governmental agency engages in the ownership and operation of public utilities, it does so in its proprietary capacity and cannot claim the exemption from taxation applicable to the discharge of governmental functions.
3. The proposed amendment would not apply to bonds issued by municipalities or other governmental agencies in their capacity as such, and the tax sought would not and could not be a burden upon any governmental function of such political subdivision.
4. The tax by the terms of the amendment is confined strictly to the interest on such bonds as on their face appear to have been issued for the construction, acquisition, operation or maintenance of a public utility, which do not constitute general indebtedness of the issuer but are payable out of the revenues of such utility or otherwise than by general taxation.
5. Every consideration of public policy on the part of the federal government supports the contention that municipalities or other political subdivisions entering into the field of business should be subject to the same conditions and limitations as those imposed by the federal government upon like classes of business.

Design, Lubrication and Maintenance of Railway Motor Bearings*

By M. Guynes
Railway Motor Engineering Department, General Electric Company

NO DOUBT every one would like to have a railway motor designed without bearings, and this has been approached in the bipolar gearless locomotive motor. This motor does not have any bearings of its own, the locomotive journals being used to keep the armature in its place. Owing to the speed of a one to one ratio between the armature and the wheel and to the necessity of using only two poles the bipolar gearless motor is too heavy and too expensive for any except high-speed passenger locomotives. A less expensive motor can be made by using a speed reduction between the armature and the wheels. So at present the multipolar, geared railway motor is almost universally used for operating single and multiple unit cars.

However, the geared motor must have bearings, because the motor must be held to the axle to keep the gearing in line, and the armature must be retained in its place with respect to the poles and brush-holders. Various types of construction have been employed, but the most satisfactory are incorporated in the modern box frame motor, with its overhung axle brackets, its clamped axle linings, its solid frame heads driven and bolted in place and its keyed armature linings pressed into the frame heads.

In order to have low friction in the bearings the shaft or axle must be held away from the bearing lining by a lubricant film. Oil was used in the first railway motors and is still the best lubricant. In the early days the oil cup for feeding the oil to the bearing was tried. Today all over the world there are a great many motors with grease lubrication and the combination of grease and oil lubricated bearings is still running. In Australia and elsewhere there are a number of motors running with oil rings in the armature bearings. Grease lubricated ball bearings and roller bearings have been tried and are operating now, but apparently the most satisfactory all-around bearing for a railway motor is the oil-lubricated, waste-packed sleeve bearing, which with good care will run 250,000 miles in the ordinary city service before removal is necessary.

Because of the relatively low pressures and speeds, unlined bronze axle bearings have proved the most satisfactory for small railway motors, although for large motors a tin-coated bore is desirable. But for armature bearings, where the pressures and speeds are fairly high, a bronze shell with a lining of tin base babbitt has justified the expense, because when first put in service, if there is any misalignment or if there are any high spots, the babbitt will flow and increase the actual bearing surface at a sufficiently low temperature to prevent serious damage.

As the shaft and axle diameters are usually fixed by the strength required, the application of a motor to a given service must be checked to make sure the surface speed of the shaft is not too high. Furthermore, shaft deflection must be checked on heavy multiple-unit cars or locomotives to make sure that the bending of the shaft at the operating speed is not sufficient to break down the oil film, and sometimes it is necessary to make the shaft larger than the strength requirement would demand.

The length of the bearing must be determined by the allowable pressure per square inch and the space available for lubricating the bearing. On some locomotive motors the pressures are as high as 500 lb. per square inch when starting a train and 185 lb. per square inch at the continuous rating of the motor, but on motors for single-unit or multiple-unit cars the pressures can be kept lower, some being as low as 200 lb. per square inch at starting and 20 lb. per square inch at the free running speed.

The waste chamber in the frame head or axle cap must be of sufficient size to hold a good sized wick extending from the top of the opening through the bearing to below the minimum oil depth. The thickness of this wick need not be more than 2½ in. at its maximum, but at the minimum the thickness should not be less than about ¾ in. for large motors where a great amount of oil is required for lubrication or about ½ in. on small motors. The entrance to the waste chamber should be accessible and of sufficient size to allow proper packing, also it should be covered to keep out water and dirt.

The oil chamber should hold sufficient oil to keep the oil depth within the desired limits from one oiling until the next and still have a settling chamber below the minimum oil depth.

Manufacture

In the manufacture of a railway motor care must be used to produce satisfactory finishes, fits, clearances, etc.

The centers in the ends of the shaft should be properly located in the rough bar so that straightening of the rough bar is not required. Because of warping it is desirable to rough cut all keyways before finish grinding of the keyways. The journal surfaces should be ground to dimensions shown in the accompanying table. To produce smooth journal surfaces they should be rolled between smooth-hardened steel rollers. After being rolled the journal surfaces should be protected by sleeves until the armature is assembled in the frame. During the stacking of the armature core the punchings must be assembled correctly or the shaft will be bent when the core is pressed.

After the cores are assembled, but before the windings are put on, the shaft should be checked for straightness. If the shaft runs out of true more than 0.00025 in. per inch of length of the journals and not over 0.00075 in. per inch it should be straightened to run within the limit of 0.00025 in. per inch. If, however, it is out of true more than 0.00075 in. per inch the shaft should not be used.

Armature bearing shells should be inspected just after the roughing cut operations are finished and those scrapped which are found to have shrink cracks or spongy spots. The bores of the shells should be tinned all over. The bearings should be brought to a temperature of at least 150 deg. C. when the babbitt is poured and the babbitting should be done in such a way that the layer of babbitt is compact and free from blow holes. A fair-

*Abstract of a paper presented at a meeting of the Metropolitan Section, American Electric Railway Association, New York City, Jan. 8, 1926.

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sized radius should be provided where the bore joins the flange to allow the oil to flow around and out to all of the flange. After the bearings are finish bored and faced they should be mounted on arbors and the outside finish ground to the dimensions shown in the table. The edges of the waste opening should be trimmed to allow easy access of the oil to the journal.

The fits on the frame heads, for the frame, should be turned to within limits shown in the table and the frame heads should be finish bored true with respect to the fit for the frame. The finish of the bore should be very smooth to give a good fit of the bearings and the dimensions and the pressure required to assemble the bearings should be as shown in the table. After the bearings are assembled they should be broached to give a smooth bore of the correct diameter.

The tongue fit on the axle caps and the groove fit in the magnet frame should be machined to the dimensions shown in the table. When machining magnet frames for large motors it is desirable to rough machine the frame head fits and axle bores before finishing either, but this is not necessary on the small motors which do not warp so much. In order to obtain good alignment it seems best to finish the frame head fits with the axle joint face bolted to a fixture on the boring mill and then finish the axle bore on another machine tool, locating from the finished frame head fits. The fits for the frame heads and the axle bore should be within the dimensions shown in the table.

Experience has shown that it is good practice to put a heavy oil on the shaft journals near the thrust collars and on the thrust collars just before assembly of the armature in the frame.

After being finish machined the axle bearing shells should be carefully inspected for shrink cracks and spongy spots. If any of these faults are found the shells should be scrapped. The finished axle bearings should be checked in a pot fixture representing the magnet frame and axle cap to make sure the dimensions are such that they will operate satisfactorily. The outside diameter and the bore should be machined to the dimensions shown in the table. The edges at the split should be relieved and sharp corners removed from the waste opening to allow the oil to flow where it is needed. Where the bore joins the flange a large radius or chamfer with rounded edges is desirable to allow the oil to flow onto all of the face of the flange

An axle dust collar, to protect the flange of the commutator end axle bearing, and a tight fitting dust guard between axle caps will give much longer life of axle bearings.

ALLOWANCES ND LIMITS FOR RAILWAY MOTORS

Part and Place	Allowance	Limits
Shaft		
Journals	None	+0.000 in. −0.001 in.
Armature Lining		
Outside diameter of body	+0.002 in.	+0.0005 in. −0.0005 in.
Bore up to 3¾ in. diameter	+0.009 in.	+0.002 in. −0.002 in.
Bore 3¾ in. diameter and above	+0.013 in.	+0.002 in. −0.002 in.
Assembly pressure		3 to 7 tons
Frame heads		
Fit for frame	None	+0.002 in. −0.000 in.
Bore	None	+0.000 in. −0.001 in.
Axle caps		
Tongue fit	None	+0.001 in. −0.000 in.
Magnet frame		
Groove fit	None	+0.000 in. −0.001 in.
Bore for frame heads	None	+0.002 in. −0.002 in.
Bore for axle linings	*	+0.004 in. −0.000 in.
Axle linings		
Outside diameter	+0.003 in.	+0.001 in. −0.001 in.
Bore	+0.030 in.	+0.002 in. −0.002 in.

* Before boring the axle preparation, 0.014-in. thick shims should be put between axle caps and axle joint face of the frame so that a clamp fit on the axle bearings will be obtained when the boring is finished and the 0.014-in. shims are removed.

LUBRICATION

Before being put in service the motor bearings should be lubricated. In an oil lubricated bearing the shaft or axle is separated from its bearing by a film of oil and it appears that low friction is the result of one side of the oil film adhering to the shaft or axle, the other side adhering to the bearing lining and the sliding occurring within the film of oil. Experiments have shown that the friction in the film of oil depends on the kind of oil used with a particular bearing material, the shaft or axle being of steel.

The oil used should adhere well to the shaft, axle and bearing and be of sufficiently high viscosity to maintain the required thickness of oil film under the operating conditions of bearing pressure and temperature. It should also be thin enough, at the temperature of the bearing housing, to allow capillary action to reach the journal.

The main requisite of the waste is that it should be of a springy nature so that it will not settle down or away from the journal and will allow the foreign matter, which is collected from the journal, to work back and down through it without glazing the surface. Also, the waste should be of such a nature that the oil will feed fast enough to allow of a relatively large variation in oil depths and still supply the amount of oil required to keep the bearing cool. Experience has proved that the long fiber all wool waste has characteristics most nearly approaching those desired.

In order to make sure that the process of lubricating the bearing will start immediately after being packed, it is necessary to saturate the waste with the oil before packing. As the oil flows so slowly at winter temperature it is desirable to provide some means of keeping the treating tank up to summer temperature and thus make a uniform minimum time for treating the waste. At summer temperature about 72 hours is required for soaking and 48 hours for draining. When properly saturated, a little oil will still flow out if a ball of the waste is squeezed.

No matter how good the oil and waste are, if the packing of the housing is not properly done hot bearings will occur. The waste must be placed so that it acts as a wick extending from below the lowest oil depth to above the top of the opening to the journal and of sufficient thickness to provide the quantity of oil required. Because of the shape of the waste pocket in the frame heads at the bearing flange end special care is necessary to provide a wick the full width of the opening to the journal. The tightness of the packing is important, for, if too loose, the waste will settle and not cover all of the opening to the journal. If a pad of the saturated waste is placed on top of the packing and next to the cover, it will catch and hold most of the dirt which falls in when the cover is opened. The covers to the oil wells and waste chambers should be kept tightly closed when the motor is in service because the water and dirt, which would otherwise enter, are the worst enemies of a railway motor bearing.

The location of the bottom of the opening to the journal with respect to the bottom of the oil well should be obtained from the manufacturer so that the desired oil depths can be determined. The desirable oil depths are from ½ in. below the waste opening to 3 in. below for ordinary city service or about 2 in. below for services where the shaft speed is high for a considerable time between stops.

Flooding of motors with oil results in serious damage to insulation of windings and commutators and is also the cause of much brush trouble.

On self-ventilated motors the openings to the drip pockets in the frame heads become air inlets if left open and much longer life of armature bearings will be obtained if these openings are loosely plugged with dry waste, which should be replaced with a fresh piece of waste at each oiling.

MAINTENANCE

On some of the modern small wheel cars the space allowed in the truck assembly is far too small to give the attention to the armature bearings which they must have in order to give satisfaction.

Hot bearings are serious, for they are not only likely to damage themselves, the shaft, axle and sometimes the armature, but may cause warpage, which can be corrected only be remachining of the parts. However, if the car were given a bearing run, as is necessary on an automobile before being put in regular service, the bearings would have a chance to give real satisfaction.

The records of one operating company show that 70 per cent of its armature troubles are due to mechanical failures, and bearings play the most important part. Worn and loose bearings are largely responsible for short life of gears and pinions, breakage of shafts, peening of bearing housings, flashing, broken armature leads and loose armature parts; in fact, they have more to do with high maintenance costs than any other part of the motor.

The inspections of bearings and bearing housings for worn bearings, loosely fitting covers and water and sediment in oil wells should be made at sufficiently short intervals to reduce the bearing troubles to a minimum. Radial wear of armature bearings can be found by checking the air gap. On single and operated equipment, where the wear is upward on some bearings, special care must be taken, as a great error may creep in. Radial

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wear of axle bearings can, of course, be found by noting the clearance at the bottom between the axle and the bearing. Wear on the bearing flanges can be determined for the armature bearings by moving the armature longitudinally and for the axle bearings by moving the motor along the axle, but on single-end-operated equipments having helical gearing most of the wear will be toward one end.

Fifteen hundred miles of service between inspections for both armature and axle bearings is about right for large motors and about 1,000 miles for small motors. It should be borne in mind that worn armature bearings are more serious than worn axle bearings. The radial wear on the armature bearings should not exceed $\frac{1}{16}$ in. on large motors or $\frac{1}{32}$ in. on small motors, while that for axle bearings should be not greater than $\frac{1}{16}$ in. on large motors or $\frac{1}{8}$ in. on small motors. The flange wear on armature bearings should be held to a maximum of $\frac{3}{8}$ in. on large motors or $\frac{1}{4}$ in. on small motors, and for the axle bearings $\frac{1}{2}$ in. on large motors and $\frac{3}{8}$ in. on small motors. If the wear allowed is less than that determined by the above limits, longer life of the other parts may be expected.

The one thing which causes as much wear on axle bearings as anything is loose axle cap bolts, and since this fault must be overcome the manufacturers should be glad to know of such troubles so that with united effort improvements will be obtained.

Satisfactory results should be obtained if the armature and axle bearings are oiled every 1,500 miles on large motors and 1,000 miles on small motors, but these periods must depend on the rate at which the oil is used.

One large operating company does not add oil to the axle bearings but depends on saturated waste, which is replaced at about 10,000-mile intervals, furnishing the necessary oil. While this practice is probably satisfactory where followed, it is doubtful if the average trolley company would be willing to use such a large amount of waste as would be required on the small motors.

Easier oiling will result from having the oil at summer temperature and oiling while the motors are warm. When necessary to open the cover of the oil well or waste chamber, less dirt will fall in if the dirt on the outside is removed from around the opening and in the winter care should be taken to prevent snow and water entering while the chambers are open. After measuring the oil depth the necessary amount of oil should be added, to bring the level up to the maximum desired depth, by pouring into the oil well and not the waste chamber.

The practice of stirring the waste to prevent glazing does not seem to be very satisfactory, but the replacing of all of the waste after cleaning at about 10,000-mile intervals has given good results. When cleaning, attention should be given to removing all of the sediment and as much care should be taken during repacking as was taken at the first packing.

The practice of changing armature bearings each time an armature is changed should not prove satisfactory as it quickly results in the bearings becoming loose in the frame heads, and it is far better to have excessive clearance in the bore than to have the bearings loose in the frame heads. However, it should be borne in mind that serious damage may be done by endeavoring to operate a motor with small bearing clearance at the one end and excessive clearance at the other end.

When making a general overhaul of a motor all parts should, as far as possible, be brought back to the original finishes, fits and clearances by using as good material as was used in the original parts, and attention should be called to the fact that bent axles and shafts and tapered journals may cause trouble.

It is sometimes necessary to weld certain places on frames, axle caps, etc., and the manufacturers have found that it is almost impossible to do much welding at one place without having to weld all of the finished surfaces, because the heating to the welding point at one place usually causes a sufficient warpage to throw other parts out of alignment.

Low costs of operation should be the object of all, and manufacturers of railway motors should be glad to assist in solving any problems, for by so doing they would be better fitted to produce satisfactory apparatus. Satisfactory equipment means lower maintenance costs and hence an improved financial position for the company as a whole.

Bus Operation

SUBJECTS to be studied during the year were discussed and selected at a meeting of the committee on bus operation of the Transportation & Traffic Association held at association headquarters, New York, Jan. 4. Altogether some twenty subjects were suggested for consideration but four were later eliminated, leaving sixteen, for the study, of which sub-committees were appointed.

The committee indorsed the uniform classification of bus accounts as recommended by the Accountants' Association, urged its adoption by member companies, and advocated that efforts be made to have it adopted by the various state commissions. Sub-committees were appointed as follows:

Interurban Rates—R. N. Graham, D. A. Scanlon and E. D. Dreyfus.
City Rates—A. T. Warner, C. B. Cooke, Jr., and C. H. Chapman.
Taxation—S. W. Greenland, C. B. Cooke, Jr., E. D. Dreyfus and A. Hughes, Jr.
Rights of Steam and Electric Railways in Operation of Buses—C. B. Cooke, Jr., A. Shapiro, V. W. Berry and A. Hughes, Jr.
Franchises—S. W. Greenland, D. L. Fennel and R. B. Hill.
Chartered Service—C. B. Cooke, Jr., D. A. Scanlon, A. Hughes, Jr., and A. Shapiro.
Equipment (from the transportation standpoint only)—R. N. Graham, B. W. Arnold and V. W. Berry.
Carrying Packages and Mail—V. W. Berry, C. B. Cooke, Jr., A. Shapiro and R. B. Hill.
Opportunity of the Bus in Developing Public Relations—C. H. Chapman, J. B. Stewart, Jr., and E. D. Dreyfus.
Customer Ownership—R. H. Smith, E. D. Dreyfus and S. W. Greenland.
Rates During Development Periods—A. T. Warner, C. H. Chapman, S. W. Greenland, C. B. Cooke, Jr., and A. Hughes, Jr.
De Luxe Service—D. L. Fennel, A. Shapiro, E. D. Dreyfus and A. T. Warner.
Development Expense—C. B. Cooke, Jr., A. T. Warner, A. Hughes, Jr., and E. D. Dreyfus.
Tire Mileage Contracts—J. B. Stewart, Jr., S. W. Greenland and C. B. Cooke, Jr.
Liability Insurance—R. N. Graham, A. Hughes, Jr., V. W. Berry and J. B. Stewart, Jr.
Double-deck Operation—D. L. Fennel, S. W. Greenland, D. A. Scanlon and A. Hughes, Jr.

A telegram was received from B. W. Arnold saying that he had been called back to Milwaukee while en route to New York City on account of the death of his son. A telegram of sympathy was sent by the committee to Mr. and Mrs. Arnold.

Members present at the meeting were J. B. Stewart, Jr., chairman; S. W. Greenland, D. A. Scanlon, R. N. Graham, E. D. Dreyfus, A. Shapiro, A. T. Warner, C. D. Smith, C. B. Cooke, Jr., V. W. Berry, C. H. Chapman and A. Hughes, Jr.

Merchandising Transportation

ON JAN. 12 the merchandising transportation committee of the Transportation & Traffic Association held its first meeting this season at association headquarters. Chairman R. N. Graham, general manager of the Pennsylvania - Ohio Electric Lines, Youngstown, Ohio, presided. Other members present were S. E. Emmons, Baltimore; E. A. Palmer, East Pittsburgh; C. D. Smith, New Brighton, Pa.; E. A. Burleson, Schenectady, N. Y., representing J. C. Thirlwall; A. C. Spurr, Wheeling, W. Va.; J. A. Dewhurst, New York; O. A. Broten, Chicago; J. B. Donley representing W. H. Boyce, sponsor, Pittsburgh; E. M. Walker, Schenectady, sponsor; J. W. Welsh, executive secretary, and Guy C. Hecker, special engineer of association headquarters also were present.

After discussion of the accomplishments of similar committees in other years and the advancement of the art of merchandising transportation it was decided to break up the writing of the report into eight sections, each to be prepared by a sub-committee. The tentative divisions of the subject and assignments made by the chairman at the meeting are as follows:

Courtesy, Salesmanship and Appearance of Trainmen.—C. D. Smith, R. W. Emerson and J. B. Donley.
Advertising by Circular Letter, Car Cards, Newspapers, Billboards and All Other Forms.—A. C. Spurr, O. A. Broten and W. W. Holden.
Equipment.—The show window of the railway company, concentrating particular attention on details of lighting, heating, seats, painting, cleaning of cars—J. A. Dewhurst, W. E. Wood, S. E. Emmons, E. A. Palmer and J. C. Thirlwall.
Special Types and Classes of Service and Special Rates of Fare.—C. D. Smith, J. A. Dewhurst, S. E. Emmons, W. H. Burke and H. L. Brown.
Maximum Use of Facilities, Including Freight and Express Operation.—S. E. Emmons, E. A. Palmer, O. A. Broten, A. C. Spurr, J. B. Donley and J. C. Thirlwall.
Merchandising Methods Necessary in Changing Methods of Operation, Such as Establishment of One-Man Service.—O. A. Broten, E. A. Palmer and R. N. Graham.
General Company Interests in Civic Affairs.—W. E. Wood, C. D. Smith, R. N. Graham and J. A. Dewhurst.
Co-operation and Training of Employees in Merchandising Problems.—J. B. Donley, W. W. Holden, J. A. Dewhurst and R. N. Graham.

All sub-committees were asked to have drafts of their sections prepared and written in time for the next general meeting of the committee to be held some time in May.

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Engineering Executive

ON JAN. 7 the executive committee of the Engineering Association held its second meeting for the season at headquarters, New York, with President R. C. Cram, chairman; C. R. Harte, R. H. Dalgleish, Daniel Durie, M. B. Rosevear and W. F. Graves in attendance.

Attention was called to approval by letter ballot of certain matters requiring action of the 1925 standards committee. These included a supplemental report on steel rails of the committee on way matters and a drawing in the report of sub-committee No. 6 of the power transmission and distribution committee relating to trolley contact devices.

President Cram reported on the action taken by the American executive committee approving the furthering of research by the Engineering Association. Mr. Cram spoke of this as being a forward step on the part of the parent organization in recognizing the work of the engineer.

Several research subjects under investigation by the Engineering Association were discussed. It was agreed that study of the committee on rail corrugation should be continued and carried to completion with the same personnel as previously. The committee on automatic substations was directed to proceed with its tests on ventilation, and the committee on noise reduction to continue its investigation. It was recommended that the latter committee investigate the possibility of obtaining co-operation from the technical schools. As to trolley wire specifications, Mr. Rosevear explained the significance of the twist test, which he said is not included in standard specifications for other current-carrying wires. It was brought out that line engineers consider this test of considerable value in determining the quality of trolley wire. It was planned to make a series of tests in actual service on wire of known qualities.

After some discussion, Mr. Hecker was directed to prepare a procedure for requesting expenditures from funds available to the various committees, for submission to the executive committee for approval by letter ballot.

The president announced that by letter ballot the executive committee approved the omission of abstracts of reports from the proceedings. A second letter ballot concerned the reduction of routine business on the floor of the convention. This brought out that nearly all of the time available at the annual conventions is devoted to the transaction of routine business, principally approval of committee reports and adoption of standards. The opinion was expressed that such approval could be obtained through letter ballot, freeing the convention for a program of original papers and discussion. It was decided to present the matter before the American executive committee at its next meeting.

A motion was adopted to form a committee on convention program for the purpose of selecting subjects and speakers on engineering subjects. Mr. Harte was appointed chairman, Messrs, Dalgleish, Durie and Miller given the asignment of preparing the program for an equipment day; Messrs. Rosevear and Scofield for a power day, and Messrs. Graves and Cram for a way and structures day.

Publication of Engineering Manual

Preparations for the publication of the 1926 Engineering Manual were discussed. It was voted that no rebate should be made for the return of first edition copies. It was voted to issue paper bound sections as heretofore. As to the way and buildings and structures sections, it was decided to retain the present subdivisions.

Mr. Hecker pointed out that the present practice of permitting revisions of Manual sections every year was leading to considerable confusion on the part of users and was resulting in large annual supplements. It was decided that revision of Manual sections shall be permitted only in the years of republication with the exception of revisions considered of sufficient importance to demand immediate attention if approved by the executive committee, or specifications taken from other associations or prepared jointly by the Engineering Association and other associations, which may be revised for the purpose of keeping such specifications up to date and uniform.

Mr. Durie suggested that a reduction in the number of drawings would be possible through the use of letter dimensions with tables. This plan was referred to the Manual committee with instructions to report back to the executive committee.

Additional Subjects Suggested

Several new committee subjects were considered. A letter ballot approved the inclusion of the subject of car lighting. It was voted to have this taken up by the equipment sub-committee on modern car design, increasing the personnel, if found desirable, by the inclusion of several manufacturer car lighting experts.

Letters from manufacturers of antifriction bearings were read, suggesting that the subject of roller bearings be considered. It was the sense of the committee that the subject had not yet reached a point of development warranting investigation by the Engineering Association.

Two additional subjects were assigned to the equipment committee. These are No. 7, "Study the modernization of car equipment with special reference to appearance and comfort and convenience of passengers," and No. 8, "Study motor leads, connectors and supports to provide a miscellaneous method and practice on the subject. This is to include size and strand of all leads, connectors, covering for cables, methods of supporting and marking of terminals."

The committee approved a motion by Mr. Dalgleish, seconded by Mr. Harte, that the study of the subject of substitute ties be discontinued.

Mr. Hecker outlined the experiences and results to date with the new procedure being followed by the way and structures division. The executive committee was unanimous in approving the new method of organization and was of the opinion that the committee reorganization be extended. It was suggested that First Vice-president Harte should start the tentative organization of a power group.

Simplified Practice

Mr. Dalgleish, chairman of the special committee co-operating with the Division of Simplified Practice of the Department of Commerce, gave the status of several subjects with which the association has had contact, as follows:

Simplification of sidewalk glass and roof lights: Recommendations of the division have been formally approved.

Recommendations for grinding wheels: These have been accepted and formally indorsed.

Recommendations for tacks and nails: The executive committee indorsed the sizes of tacks recommended for use in the upholstery department.

Simplification of shovels, spades and scoops: Formal indorsement of the association is being withheld pending approval by the way and structures committee.

Carbon commutator brushes: Simplification of sizes of carbon brushes has been started and a report is expected within a short while.

Mr. Hecker stated that at present no standard procedure has been set for presenting specifications to the A. E. S. C. It was the sense of the meeting that such procedure is necessary. The following was approved:

1. A specification intended for presentation to the A. E. S. C. shall, after preparation, be submitted to a standing committee or the standards committee of the association for criticism and approval.

2. The specification shall then be submitted to the executive committee for criticism and approval.

3. The specification, after approval by the standards committee and executive committee as above, shall then be presented to the A. E. S. C. as a tentative standard only. The status of "tentative" standard shall then be maintained for one year, after which it may be advanced in accordance with A. E. S. C. procedure to the grade of American Standard.

4. If the specification is turned down at any time by any of the bodies whose approval is required it must then be returned to the sectional committee for revision.

Mr. Dalgleish accepted appointment as the second representative of the association on the main committee.

Attention was called to the authorization of extension of the scope of the A. E. S. C. project on plain girder rails to include joint plates, omitted from the original report.

Specifications for tubular steel poles are now in process of preparation, including a simplified list of sizes as the result of a questionnaire circulated among approximately 100 companies using steel poles.

The representation of the association on the sectional committee on overhead line crossing specifications has been filled out and the committee is now about to function.

It was announced that H. S. Murphy has accepted appointment on the sectional committee on specifications for zinc coating on iron and steel.

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A number of matters involving relations with other associations were considered. Principal among these were specifications being handled by the A. S. T. M. These included hard and medium-drawn copper wire, copper trolley wire, and carbon steel rails.

Representatives of the association on committees of the National Fire Protection Association were announced, as follows: L. D. Bale, power house committee; R. L. Weber, National electrical code.

Mr. Harte reviewed the standardization work of the American Institute of Electrical Engineers.

H. A. Johnson and E. J. McIlraith were appointed to represent the association at the American Road Builders' Association convention.

Manufacturers' Engineering Committee

TABULATING essential characteristics of new cars, analyzing financial reports of railways that have been operating new equpiment and a study of reports on obsolete equipment kept the manufacturers' engineering committee busy Jan. 14 and 15 at association headquarters, New York City. The full committee was in attendance, consisting of G. C. Hecker, chairman; James A. Brooks, C. A. Burleson and W. J. Clardy.

A large number of blueprints of late car designs had been supplied by various car manufacturers. These were studied carefully and the governing dimensions were tabulated. Analysis of the various characteristics of modern car design enabled the committee to select a number of designs that appeared to embrace most of the essentials. These will be analyzed and studied further to determine definite sizes and types most desirable for various classes of service.

Representatives of the electrical manufacturers have assembled considerable information from properties that have been operating new equipment. Study of this information is being made by the committee at the same time as other data regarding savings in operation and maintenance that have resulted from operation of new equipment are being assembled.

The survey to determine age of equipment now operated is nearly completed and particular attention will now be devoted to tabulations and analysis that will enable the committee to draw definite conclusions.

M. & O. Committee Makes Preparation for Visits

SECRETARY G. C. HECKER of the management and operation committee of the American Association has sent to all members of the committee supplies of blank field reports and of a pamphlet prepared by Labert St. Clair outlining the purpose of the state committees on public utility information.

He also called attention of the members to the meeting of the entire committee, which has been called for Jan. 27. Through the courtesy of L. M. Brown this meeting will be held in Indianapolis at the Indianapolis Athletic Club. A Dutch-treat dinner will be served at 6:30 p.m.

A limited number of proofs of the forthcoming handbook of modern methods has been received by Mr. Hecker. He plans to distribute samples of these among the committee members so that they may become familiar with the contents and method of presentation adopted.

Atlantic City Being Considered for the Convention

CONSIDERATION of Atlantic City as the place for holding the October convention is being given by the committee on location. Arrangements were made for a sub-committee consisting of the same persons who visited Cleveland last week to inspect the proposed facilities at Atlantic City the evening of Jan. 15. Those making the inspection at Cleveland were Chairman C. E. Morgan, Executive Secretary J. W. Welsh, Director of Exhibits F. C. J. Dell, J. H. Alexander, Morris Buck, H. J. Kenfield, J. C. McQuiston, W. C. Parker, A. L. Price, A. M. Robinson and L. W. Shugg. In addition A. J. Purinton and J. R. McFarland have signified their intention of being present. A difficulty encountered in case Atlantic City is chosen is that the available space for exhibition purposes is insufficient to provide proper facilities and keep the delegates together. Even the arrangement of last year, with a portion of the automotive exhibits in a separate space across the Boardwalk, is impossible of repetition, as the property is being built upon. A proposition has been advanced to build a permanent exhibit hall fronting on the Boardwalk.

At Cleveland it was found that the immense auditorium with two large floors available for exhibition purposes will give only 50,000 sq.ft. of net space, or less than half that needed to house the show. There is available a large plot of city property immediately adjoining the auditorium on which it is proposed to erect a temporary building which can have a floor area of 70,000 sq.ft. or more if needed and still provide plenty of space for outside working exhibits. Through the co-operation of President J. J. Stanley and Vice-President J. H. Alexander of the Cleveland Railway it would be possible to build this at a nominal cost.

News of Other Associations

New Limit Gage Standard

WORK of preparing standard gages, including the method of using the gages and tables showing the degree of accuracy required in the inspection of parts for different classes of work, has just been completed through the standardization of limit gages by the American Engineering Standards Committee. As an example of the advantages from this standardization, a wheel intended for a certain sized shaft made by one manufacturer should fit upon the same sized shaft made by another manufacturer. Under present conditions, however, perfect fitting is rarely realized. The reason is that the wheel manufacturer bores a hole in accordance with one set of gages, while the manufacturer of the shaft uses a set of gages based upon a different system. In consequence, one piece may be either a trifle too large or too small for the other, with the result that the wheel will either not go on the shaft at all or else it will fit too loosely. With the new gages most manufacturers will use the nationally standardized uniform gages for determining the dimensions. Perfect fitting should be assured no matter when and where the new parts are manufactured.

The report now presented provides a classification of the various kinds of fits from the loosest as used in agricultural machinery and similar equipment to the forced or shrink fit, where the parts are pressed together under great pressure, so as to be rigidly attached to each other and to stay there, as is required for car wheels.

In general, a certain fit between two mating parts will be obtained by checking the size of each part by means of two gages, each representing one of the two limits between which the actual size of the parts must be kept. One gage is called the "go gage," the other the "no-go gage." If only such parts are accepted as are shown by these two gages to be correctly machined perfect fitting should be obtained.

The plan for standardized tolerances, allowances and gages has been developed through the co-operated effort of constituent national, technical, industrial and governmental bodies of the American Engineering Standards Committee. The committee itself has now placed its final approval upon it and has presented it as a national standard to American industry.

Gages of this type should save considerable time and expense on many occasions when equipment of different manufacturers are assembled in either manufacturing establishments or in car shops of operating companies.

Central Traffic Meeting

ON JAN. 20 and 21 the Central Electric Traffic Association will hold its next regular meeting at the Miami Hotel, Dayton, Ohio.

The morning session on Jan. 20 will begin at 9 o'clock, and will be in the nature of a round-table discussion. Committee work necessary during the session will be transacted during the afternoon of Jan. 20. In order that more time may be given to the transaction of business committee work will be completed as far as possible before the meeting.

The session on Jan. 21 will be devoted to reports of committees and such other business as may properly be presented.

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The News of the Industry

Temporary Rate Increase in Oakland

Rates on the lines of the Key System Transit Company, Oakland, Cal., are to be increased as a result of the company's application for relief following a higher wage award made recently to carmen by an arbitration board. This is the decision of the California Railroad Commission.

Street car fare is increased from 6 cents to 7 cents and ferry fares are advanced from 18 cents to 21 cents, pending decision on the company's application for permanent higher rates, hearings on which will be resumed Feb. 3. The temporary rates were set to go into effect on Jan. 15.

It had been thought that there would be no temporary increase in ferry rates because the Southern Pacific rates will remain at 18 cents until the outcome of the hearings for permanent increase asked by this concern. The Railroad Commission, however, surprised nearly every one by granting a temporary raise in Key company ferry rates, and letting the 18-cent Southern Pacific rate stand.

The new rates awarded the Key company, it is estimated, will take care of the increases in pay given the platform men, amounting to between $400,000 and $470,000 for 1926, and enable the road to meet its fixed charges and pay its bond interest.

The 1-cent increase in street car fares, it was found, will bring in additional revenue of $526,000 and the 3-cent advance in ferry rate an additional $250,000. In addition the increase in monthly commutation rates from $4.80 to $5.20 will net the company $64,000 annually, making a grand total of $846,000.

C. O. G. Miller, president of the Key System Transit Company, said:

> After a brief study of the decision the Key System Transit Company is of the opinion that the temporary rates will enable it to meet its operating costs and fixed charges until there can be a permanent readjustment of the rates on the valuation of its property used in public service.
>
> However, the temporary rates are not sufficient to give a reasonable return upon the property so as to warrant the company in making the investment necessary to provide the service which it desires to give the public and to keep step with the growth and development of the East Bay cities.
>
> Not a dollar for improvements comes from fares. It is capital investment and the sums to be spent must be provided by bonds or by money secured in some other manner. It is the primary duty of the Key system to give service and it is the policy of the company to provide such service when and as needed.
>
> The Key system directors fully realize their responsibility in ordering a capital expenditure of nearly $3,000,000 before proper return has been granted on the value of the company's property dedicated to public service, but these expenditures have been authorized in the belief that the East Bay cities and the State of California want their public utilities to be operated at rates that permit a proper return and protect them from confiscation.

The announcement of the rate increases stirred a storm of protest in the East Bay, but most citizens have assumed an attitude of watchful waiting and it is believed the resentment that has flared up over the increase in rates will subside if the company gives improved service and puts through its improvement program. On this program are the purchase of two new ferryboats to cost $1,700,000, the reconstruction of 45 miles of track, the purchase of more buses, the purchase of 120 new cars and improvements at the Key pier.

Contract for the new ferryboats has just been awarded to the Moore Dry Dock Company, Oakland. They will have a passenger capacity of 4,000 each.

Ten-Cent Cash Fare Sought in Syracuse

It is expected that the New York State Railways will at once file its application with the State Public Service Commission for permission to raise the trolley and bus fares in Utica and Syracuse from 7 to 10 cents. Tickets, under the proposed new schedule, would be sold for 7½ cents.

When Benjamin E. Tilton, general manager of the New York State Railways for Syracuse and Utica, called on Mayor Hanna of Syracuse to serve notice on him that the company would apply within a week for permission to increase the fare, Mayor Hanna notified Mr. Tilton he would fight such action.

Rochester accepted the increase of its trolley and bus fares on all lines of the State Railways, effective New Year's Day, without protest.

Authority of Courts in Rate Cases Defined

Public utilities cannot appeal to the courts from mere fear of confiscatory rates or until they have exhausted other remedies provided by law. The Supreme Court has so held in affirming the decision of the lower courts in the case of the Henderson Water Company against the North Carolina Corporation Commission. In 1922 the water company applied to the commission for an increase in the rates over those fixed in the franchise granted a predecessor corporation in 1896. The commission permitted an increase of 10 per cent for a test period of six months. Before this test period expired the company, fearing that the increase would not be continued, applied to the court for an injunction against a reduction. Its petition was dismissed in the trial court on the ground that no order for reduction had been issued and that the law creating the State Corporation Commission provided other means of appealing from decisions of the commission. The Supreme Court, in a decision by Chief Justice Taft, agrees with the reasoning of the lower court.

Seven-and-a-Half-Cent Fare in Philadelphia Upheld

The 7½-cent fare charged by the Philadelphia Rapid Transit Company, Philadelphia, Pa., was upheld in a ruling by the Public Service Commission of Pennsylvania in Harrisburg on Jan. 12. The ruling makes permanent the temporary order of the commission of Sept. 8, 1924, which had been affirmed by the Superior Court, and was based upon the record showing in large part the actual experience of the company since the temporary order of the commission increasing the fares has been in effect.

The majority vote was cast by W. D. B. Ainey, chairman, and Commissioners Benn, Shelby and Stewart. A dissenting opinion from the findings and order of the commission will be filed by Commissioner Martin. Commissioners Scattergood and Evans reserved the right to express their views in a joint report issued on Jan. 13.

In general the commission found that the gross revenue produced by the rates of fare did not exceed the requirements of the company for operation, maintenance, and renewals, plus a reasonable fair return upon the $200,000,000 minimum valuation found by the commission in 1923.

The case now settled has been under procedure since the fall of 1924, when the company applied for an increase in its rate of fare from 7 cents cash with a 6¼-cent ticket rate to an 8-cent cash fare with a 7½-cent token rate. Not only were the hearings in the matter long drawn out but they were very often stormy ones.

In fact, the fare issue caused a breach between Governor Pinchot and his commissioners, which had many serious consequences. After the temporary order was issued Governor Pinchot publicly criticised the commission for its action. Shortly thereafter Samuel M. Clement resigned from the commission in protest against the Governor's denunciation. Later Governor Pinchot, while the hearing was still in progress, requested the resignation of Commissioners Benn and Shelby. Both these commissioners refused to accept the Governor's action and appealed to the State Supreme Court, which some weeks ago handed down a decision in their favor.

Gene McDonald's Gypsy Girl on the Air

Electric railway men will probably want to listen in on station WNAC on the evenings of Jan. 19 and 20, beginning at 8.15 p.m., when the Boston Elevated Musical Club's musical comedy, "The Gypsy Girl" by Gene McDonald, will be broadcasted from the famous Symphony Hall in Boston.

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Discussion of Tractions Resumed in Chicago

Hearings have been resumed in Chicago with a general air of expectation that, with the traction ordinances expiring in less than a year, everybody means business. At a number of sessions Samuel Insull, Leonard Busby and Henry A. Blair, the latter through an attorney, submitted to personal questioning or furnished the material for aldermanic discussions. The outgrowth of the final tense session was a request that the three traction leaders draw up their own ordinances to determine on paper where their points of agreement rest.

Mayor Dever was dragged into the session after hearing reports of bitter words from the Aldermen for his previous absences.

Mr. Busby said that the traction interests were practically united in 1925 and were "even more so now."

Samuel Insull was absent. He received a broadside from the Mayor for his $23,000,000 elevated extension program, which has been hanging fire two years. The Mayor said the offer was made "to make a record," and that if Mr. Insull had wanted to build a cross-town elevated line and additions to the present structures to furnish additional express service he could have done so in the same way as he had started his loop platform extensions, which he sincerely wanted built.

Mr. Busby and Mr. Blair favor unification. Mr. Blair's program of "one city-zone fare" is before the committee. Mr. Insull wants most a subway and asked the members of the committee to permit him to build one, if they were not prepared to proceed.

The city was informed that some kind of a long-term grant, preferably, a good-behavior terminable permit, was essential to uninterrupted service.

The Aldermen have had it made plain to them that the Chicago Surface Lines are affording a service never before equalled in Chicago and that in spite of the blind future are developing morale and equipment to the highest possible point.

$110,123 Bonus in Los Angeles

Final figures show that the Los Angeles Railway, Los Angeles, Cal., paid $110,123 to 2,208 trainmen on Dec. 15 as bonus for faithful and efficient service during the period Dec. 1, 1924, to Nov. 30, 1925. In the ELECTRIC RAILWAY JOURNAL, issue of Dec. 19, 1925, page 1089, it was said that the amount would be about $106,000. This was the sixth year of the merit and bonus system and the amount paid the trainmen was higher than in any previous year. In 1920, when the merit system was established, 1,500 men received $50,000.

The bonus is paid on a basis of $5 a month or $60 a year. Trainmen are eligible for the bonus after they have been in the service for six months. At the time he becomes eligible each trainman is given an efficiency rating of 100 per cent. A clear courtesy and safety record for the month entitles the trainman to the full $5, but demerits assessed against him for infractions of the rules or for complaints made for discourtesy or inefficiency lower his record from the rating which he is given to start with and decrease his bonus at the rate of 25 cents for each five demerits. Commendations for particularly courteous and efficient service from patrons or supervisors add to the percentage of the trainman's efficiency rating.

R. R. Smith, assistant superintendent of operation, presided over the meeting on Dec. 15 at which the Christmas money was distributed.

Guelph Favors Return of Local Muncipal Control

In the recent municipal election for the by-law favoring the return of the Guelph, Ont., system to local municipal control, a large plurality was recorded. The Guelph system has been operated for the past four years by the Hydro-Electric Railways, which is controlled and operated by the Hydro-Electric Power Commission of Ontario. As the situation now stands, some of the city's leading business men believe it would be wise to scrap the system and depend upon the bus.

Some years ago Guelph, at its own expense, built a railway line to Guelph Junction to connect with the Canadian Pacific Railroad, a steam line, about 15 miles away. Later this line was extended to Goderich by the Canadian Pacific and Guelph now collects toll on every ton of freight passing over this important grain route. Several years ago some of Guelph's leading business men conceived the idea of having the street railway operated by the steam line and it was generally accepted as an opportunity to secure efficient administration, plus the fact that there had been a desire for outside radial connection, which this proposal would have effected. When arrangements were in the making the late Sir Adam Beck started a campaign against such management by an "iniquitous corporation" and he succeeded in persuading the people of Guelph at the eleventh hour not to accept an arrangement to have the road operated under conditions offered by the Canadian Pacific Railway, although such conditions were reputed to be very favorable.

The recent vote, favoring a discontinuance of Hydro operation, was recorded in the face of opposition from local Hydro supporters. They predicted that it was the first step toward a new deal with the Canadian Pacific Railway. A local newspaper states that in the years ensuing since the Guelphites have been under Hydro management the road has been improved, but with their own money; that deficits and not dividends have been the yearly portion, and that outside connections never materialized.

Coal for Boston Elevated Employees

The Boston Elevated Railway, Boston, Mass., has made agreements with the Fore River Coal Company covering storage of bituminous coal in pocket at the Lincoln Power Station wharf. Employees desiring this kind of coal delivered at the wharf at $6.50 a ton may apply to the superintendents of divisions.

Three Thousand Greet Santa Claus at Beaver Valley Party

Santa Claus called at the Beaver Valley Traction Company Christmas party on Dec. 23 for the fifteenth year.

Arrangements for his reception had been made at the pavilion, Junction Park, where more than 3,000 greeted him and hundreds of children and adults delved into his pack, carrying away generous gifts.

The pavilion was handsomely decorated and a wonderful tree was located in the center, in which myriad lights flashed in its ice-covered branches.

Motion pictures were shown for the children, while the adults were entertained by a large chorus which sang Christmos carols. The singing was accompanied by electric chimes installed for the occasion. There were peanut and marble scrambles for the children.

The "Traction Company Party" has become a fixture in the valley. Many children who attended the first party as babes in arms were present and reported having attended each year. Many adults also have attended the party annually since the practice was started fifteen years ago.

Each year the number who attend increases. Committees and chairmen strive to make each party better than the preceding one. New gifts are selected, new entertainment arranged and more care is given to decorations and refreshment menus.

John R. Marshall was general chairman in charge of the party.

Open Hearings on Baltimore Rerouting Plans

The Traffic Commission at Baltimore, Md., has set dates for public hearings at which four plans have been advanced for rerouting the cars of the United Railways & Electric Company will be discussed. The hearings are to be open to the public. The dates are Jan. 18, 19 and 20. The four rerouting plans have been prepared as a result of a survey by Kelker, De Leuw & Company, Chicago. Following the completion of the street car rerouting plan the commission will turn to the vehicular traffic problem.

New York Traction Companies Show Insufficient Revenues

The annual report of the New York Public Service Commission with jurisdiction throughout the state but not in New York City, sent to the Legislature on Jan. 11 shows that the revenues of this group of utilities have been insufficient to meet operating expenses and fixed charges. A slight decrease in operating revenues in 1924 over 1923 is more than offset by lower operating costs, it is said. The net loss for 1924 was approximately one-half that for 1922, "this seeming improvement being in part undoubtedly due to the discontinuance of various unprofitable lines and not wholly to increased efficiency in operation or increased traffic." On Dec. 31, 1924, there were 1,934 miles of road reported as available for operation compared with 1,999 and 1,971 at the close of the years 1922 and 1923 respectively.

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New Franchise Voted in Sioux City

Sioux City, Iowa, voters recently reversed their decision of 1924 and approved a 25-year franchise to the Sioux City Service Company, operating the city traction lines. The vote was favorable in each of the 30 precincts, but only 7,580 votes were polled, dividing 5,546 in favor of the proposition and 2,034 against it.

The new franchise provides for an eighteen-hour service on all lines, removal of the Third Street tracks, elimination of the wye at Transit and Morningside Avenues, maintenance of the present fare of 7 cents, four tickets for 25 cents, as long as the company is able to show a 7 per cent return on its investment, but a reduction if this figure is exceeded; payment to the city of 2 per cent gross receipts in place of a $25 tax annually on each car and extension of tracks without specific franchise vote.

Nashville Sets Record for Safe Transportation

The street cars of Nashville, Tenn., operated by the Nashville Railway & Light Company, ran 1,025,000 miles in safety during 1925. This announcement was made when the 400 operators held a mass meeting in the Employees' Mutual Benefit Association auditorium during the last week in December, where they were praised for their work.

A great amount of credit for the record was given to H. A. Davis, superintendent of transportation, and to John J. Connors and the safety school, of which he is director, attended by 400 operators weekly. The local report for the year showed that the number of accidents had been reduced 328 during 1925 and that all cars had averaged traveling 6,577 miles per accident.

Official national recognition of the 1925 record was given by the men in a telegram from J. W. Welsh, secretary of the American Electric Railway Association in New York. He declared that the national average was far below the local record, for which he sent his congratulations.

More Transit Facilities, Says New York's New Mayor

J. J. Walker, New York's new Mayor, says it is time the traction controversy was ended and that the city had full and complete power to develop its own facilities to take care of its own transportation needs. As he sees it, this is entirely a local question which must be solved by the expenditure of local funds and does not affect any other community in the state. The Mayor feels that since it is entirely the city's money that is being spent and the city's needs that are being satisfied, the right of control, as well as of construction, should be vested in city authorities.

His administration will not permit of unnecessary conflict or controversy. In his inaugural address the Mayor said:

> Let the credit go where it will, but let us have better transit facilities. This administration will not seek to glorify itself at the expense of delay in this most essential necessity. More transit facilities must be provided without any kind of political or personal interference.
>
> The city is entitled to the co-operation of the State Legislature in its efforts to provide the additional transit facilities that are required. It is generally understood that the revenues from taxation are not sufficient to pay for the construction of the transit lines that are necessary, and that recourse must be had to the credit of the city.
>
> The borrowing capacity of the city under the present constitutional limit is not enough to construct these new transit lines as rapidly as the needs of the population demand. We shall ask the Legislature to permit the people to vote upon an amendment to the constitution to extend the city's borrowing capacity. At the time the present constitution was written it was never contemplated that the use of public funds would be necessary to provide transportation facilities or that the cost of transportation would reach the enormous amount that it has in later years by reason of requirements for subsurface construction. We are asking now to have the constitution brought up to modern conditions.

Bus-Railway Service for Celebration

Final details of local transportation in Philadelphia, Pa., during the Sesqui-Centennial celebration have been worked out by the city and the Philadelphia Rapid Transit Company. The expenditure by the railway will be about $2,100,000, of which $1,200,000 will go toward track extensions outside the Sesqui-Centennial grounds, $600,000 for extensions to the company's power distribution system required to meet the added load and $300,000 for intramural transportation. An extension of bus service is included in the plan. The company's outlay will be financed through the sale of its 7 per cent preferred stock, an issue of which was authorized recently by the Council.

Rights of State Commission Fixed in Duluth Case

The constitutionality of the act of 1921 which gives the State Railroad and Warehouse Commission of Minnesota control over electric railway rates and financing has been upheld. In the case under review the city of Duluth obtained a temporary injunction, restraining the state commission from acting on a petition of the Duluth Street Railway for an increase in fare. Three district court judges in Duluth upheld the 1921 act. This would dismiss the injunction. The city has announced, however, an appeal will be taken to the Supreme Court.

The city attacked the constitutionality of the act when the Duluth company asked the commission to set a new rate of fare in Duluth. The railway contended that the 6-cent fare then in effect yielded only 70 per cent of a fair return on the capital investment, as determined by the United States District Court.

Eight-Cent Fare in Effect in Rochester

An 8-cent cash fare went into effect on the Rochester, N. Y., trolley and bus lines of the New York State Railways on Jan. 1. The previous fare was 7 cents, in effect since the service-at-cost contract between the city and the railway was signed five years ago.

Early in December the railway filed with the Council notice of the fare increase. This action was based largely on the report of Commissioner of Railways Charles R. Barnes, which pointed out the necessity of a higher fare.

City officials did not oppose the advance. In fact, they agreed that it was justified by figures contained in the report of Mr. Barnes. Under the previsions of the service-at-cost contract fare changes do not have to be approved by the State Public Service Commission.

Under the new schedule four tickets will be sold for 30 cents. Prior to the advance four tickets were sold for 25 cents.

Passenger Traffic Holds Up Well in Syracuse

The Syracuse Railways Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways, carried 1,124,057 passengers on its lines during 1924, according to a report issued by Benjamin E. Tilton, vice-president and general manager of the corporation. This was the first yearly report on bus service for Syracuse.

The street car lines carried 32,418,356 passengers during the year. The total number of passengers, bus and trolley, was 33,542,413. This is a drop of 29,015 fares from the total for the previous year, 33,571,428.

New bus lines installed in Syracuse during 1924 are: Strathmore, Shotwell Park, Colvin Street shuttle and West Genesee lines. The Chittenango interurban route also was started during the year.

A bus line through South and North Geddes Streets to accommodate workmen going to and from factories is under consideration.

Frederick H. Fay, Boston, planning expert, is in Syracuse making a study of the entire traffic system. Mr. Fay has held several conferences with Thomas H. Mather, consulting engineer to the grade crossing commission, and city officials.

Power Deal Made at Columbus, Ohio

Announcement was made on Jan. 4 of the consummation of a 99-year contract, approved by the Ohio Public Utilities Commission, between the Columbus Railway, Power & Light Company and the Scioto Valley Railway & Power Company, whereby the former acquires valuable rights of way for transmission lines between Columbus and Lancaster, Ohio, and Columbus and Chillicothe, Ohio, over the Scioto Valley routes, and the Scioto Valley company in turn acquires exclusive rights to haul Rail-Light fuel and also agrees to buy all its energy from the Rail-Light company.

The contract forecasts the dismantling of the Scioto Valley power plant at Reese Station, Ohio. It also forecasts arrangements whereby the Rail-Light company will take over municipal power and light contracts at Chillicothe and Circleville, now held by interests closely associated with the Rail-Light company, and perhaps similar municipal contracts in other communities.

It is provided that the arrangement for the operation of Scioto Valley company cars in Columbus over Rail-Light company tracks shall continue.

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Southern Pacific Seeks Fare Advance

On the heels of the higher fares granted the Key System Transit Company, Oakland, Cal., temporarily as a relief measure to meet the increase in wages recently awarded carmen by an arbitration board, the Southern Pacific has applied for an increase in rates to the California Railroad Commission.

The Southern Pacific requests that it be allowed to raise ferry fares to 25 cents for single trips and to charge $6.50 for monthly commutation. The present rates are 18 cents and $4.80.

A hearing on this petition will be held on Jan. 18 in San Francisco, but before that time—on Jan. 15—the new Key rates will take effect and for several days the Southern Pacific will be in the position of a rival line charging lower rates than its competitor.

Company officials claim that the new rates are needed to meet a deficit in revenues incurred during the first six months of last year. An application for permanent increase in rates is now before the commission. There have been several hearings, but the matter has been postponed until February. In its prior application for a rate increase the Southern Pacific did not go on record as requesting any definite amounts, leaving that to the commissioners after study of the testimony.

Fort Dodge Still Carless

Although the option on leasing the railway system of Fort Dodge, Iowa, dormant since Nov. 14, has expired, no statement as to probable resumption of service has been made public by the syndicate of residents which announced it would lease the trolleys. The Fort Dodge Street Railway, which operated the local cars in Fort Dodge for about 30 years, suspended service on Nov. 14.

The history of the railway and the company which began bus service was given in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 28, 1925, page 975.

News Notes

One-Man Car Matter Up Again in Milwaukee.—The City Council of Milwaukee, Wis., has adopted a resolution asking the Railroad Commission for a rehearing of its recent order authorizing the Milwaukee Electric Railway & Light Company to use one-man cars on its Walnut Street line.

City Employees Must Pay Fare.—An ordinance has been recommended for passage by the City Council utilities committee of Seattle, Wash., amending an existing ordinance which permits policemen and firemen to ride free on the Seattle Municipal Railway. Under the new ordinance, these city employees will have to pay their street car fares. When the Council was working on the 1926 budget, it reduced an appropriation for policemen and firemen for car riding from $48,000 to $5,000, despite protests from the fire and police chiefs, who said the amount would not provide for the men's carfare, even limited to rides on official duties.

Company to Resist City's Fare Plan.—The Lynchburg Traction & Light Company has notified the city of Lynchburg, Va., that it will resist by injunction, if necessary, the effort of the city to cut the street car fare from 6 to 5 cents in the new part of the city. The railway is to ask for an injunction from the State Supreme Court of Appeals, and if this is granted the city will ask the court to require the giving of a receipt to all who pay the 6-cent fare so that there may be an adjustment in case the city wins the contention. The city's plan is to have the fare similar throughout the city.

Men Remain at Work During Wage Adjustment.—Trolleymen of the East Penn Electric Company, operating 36 miles of track between Pottsville and Mauch Chunk, recently demanded an increase of 5 per cent in wages. The former wage scale expired with the old year. The men decided to work for 30 days while a new scale is being adjusted. The company contends it cannot grant any increase of wages and might even curtail service because of the loss of business due to the mine strike.

What Can You Send?—The Los Angeles Railway, Los Angeles, Cal., is soliciting old photographs, time-tables, tickets or other material to show some of the history and development of the Los Angeles Railway. R. B. Hill, superintendent of operation, is at work compiling a book which will illustrate the history and development of that property. He is anxious to make the volume complete with pictures and records. He has promised to return the photographs immediately after they have served his purpose. Data should be forwarded to Los Angeles Railway Building, Los Angeles, Cal.

Wage Agreement Reached.—Under a recent agreement between the union and the Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, trainmen will receive 47 cents an hour for the first year, 49 cents for the second year and 52 cents for the third year. Shop men will receive 55 cents an hour and track men 40 cents an hour.

Town Wants Railway.—The town of Long Beach, Miss., which had formerly adopted an ordinance authorizing the Mississippi Power Company to remove its tracks and abandon its trolley service within the town limits, by a close vote of its Board of Aldermen on Jan. 5 reconsidered its former action. It requested the company to resume railway service, and set Jan. 28 for the day upon which the townspeople will vote to establish their permanent public policy on the electric railway question. Meantime, the company, acting upon authority of the town's ordinance, suspended railway service, and has been operating motor coaches on the line.

Wage Issue Up Again.—Railway employees of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, who last July accepted a compromise on their 5-cent wage increase petition, on promise that the full scale would be granted if increased earnings warranted it, have opened negotiations to secure that scale. The traction lines, granting a 2½-cent increase in July, said if earnings under the new fare were sufficient the other 2½ cents would be granted. The men claim that condition exists, but the management says earnings are "nowhere near" the estimate. The matter will be considered in conference.

Company Receives Colors.—The Chicago, North Shore & Milwaukee Railroad Post No. 753 of the American Legion was officially presented with its colors by the railroad officials in Waukegan on Dec. 17, 1925. The North Shore Railroad Post is composed entirely of railroad employees. Every department is represented in the legion, with the largest number from the transportation department. The ceremony of presentation of colors and standards included the presentation address by Charles E. Thompson, assistant to the president of the company, "on behalf of the North Shore Line." The acceptance address was made by Claude L. Foubare, Illinois Department, American Legion. Many fine musical numbers afforded enjoyment for all participants.

New Order on Commutation Tickets.—By special permission of the Public Service Commission commutation tickets of the Southern New York Railway, Inc., Oneonta, N. Y., each good for 50 trips in either direction between Hartwick and Junction within 30 days from and including date of sale, will be sold for $6.50 each. The order became effective on Jan. 11.

Fare Appeal Heard.—A. D. Mackie, general manager of the Illinois Power Company, Springfield, Ill., testifying before the Illinois Commerce Commission recently in support of the petition to increase fares to seven for 50 cents from the present rate of four for 25 cents, outlined several contemplated changes in lines and substitution and extension of bus lines. He said passenger revenue had declined from $713,008 in 1922 to $684,432 in 1924, while operating expenses had grown from $533,143 to $563,990. The company contends that its earnings are at a rate considerably less than the 7 per cent return set by the commission.

Service Improved.—Indicative of the "please the public" policy adopted by the Steubenville, East Liverpool & Beaver Valley Traction Company, G. S. Wills, general superintendent, recently announced completion of improvements costing approximately $500,000. The improvements include the operation of the Ceramic flier, providing a Pullman car service between Beaver, Pa., and Steubenville; the maintainance of a faster schedule between terminals on the interurban line, with the idea of safety first in the operation, and faster schedules all over its upper Ohio Valley system.

Windshield Wipers for Trolleys.—Garfield S. Chase, manager of the local division of the Eastern Massachusetts Street Railway at Lawrence, Mass., has announced that the road plans to equip all the street cars with wipers such as are used on the windshields of automobiles. The idea will be applied throughout the entire territory in which the road operates. It is understood the wipers will be similar to those in use in Detroit and other cities, particularly in the central West.

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Recent Bus Developments

New Jersey Board Wants Greater Authority Over Buses

In the opinion of the Board of Public Utility Commissioners of New Jersey the law for the regulation of the buses has not kept pace with the development of bus transportation. This is the view expressed by that body in transmitting its suggestions to Governor Silzer for action. In 1921 the public utility act was amended to include among the public utilities subject to the board's jurisdiction the operators of auto buses upon routes any part of which parallels on the same street the line of a street railway. There were excluded from the application of the act those operating under permits granted prior to March 15, 1921, and renewed on their expiration to the same owner for the same route.

The purpose of the amendment appears to have been to subject to regulation by the Public Utility Commission the operation of buses in direct competition with street railways, leaving free from such regulation those not in such competition and those already established in the business. The amendment did not provide for the granting by the board of permits to operate. The public utility act provides, however, that no privilege or franchise granted shall be valid without the board's approval.

The prospective operator of a bus, therefore, must first obtain licenses from the municipalities along his route and submit these to the board with an application for its approval. According to the board this procedure is simple and free from objection when the operation is in a single municipality, but during the past year the board has received numerous applications for approval where the routes passed through a large number of municipalities.

In some cases it has been proposed to parallel at various points the routes of existing bus and railway lines, without any necessity for additional transportation facilities at such points. In other cases it was evident the existing transportation facilities were inadequate and the bus service needed. In considering these applications the board met with many complications due to the lack of a law adapted to present-day conditions. It happens frequently that along a route extending through a number of municipalities permits are granted by some, while other municipalities refuse the grants or fail to act. This results in the buses running through some of the municipalities with the doors closed, doing no local business. In other cases the bus operators have attempted to stop in such municipalities at stations on private property.

In many of the jurisdictions the business of bus transportation is classified as follows:

(a) Urban or street transportation by buses within the limits of a single municipality.

(b) Interurban transportation, where the route is through numerous municipalities over long distant routes.

In the board's opinion a classification such as this is desirable and should be provided for either directly by law or by legislation authorizing the board to fix the classifications. In either event it should be specified that where the operation is within the limits of a single municipality it should be within local control to grant permits, subject to the prevailing conditions. Where the operation is interurban it is the board's opinion the prospective operator should receive from the state through the agency of the Board of Public Utility Commissioners a certificate of convenience and necessity for the operation, and that this should be regarded as sufficient authority to operate, subject to police regulation in each municipality.

It is suggested also that the law be changed with respect to the operation of buses in interurban traffic, so that buses so operated will be subject to the board's jurisdiction, without regard to whether any part of the route parallels on the same street the line of a street railway. As the law now is, it may be proposed to operate a bus between points not connected by a street railway, but if any part of the route, no matter how short, is upon a street in some municipality where there is a street railway track the operation is subject to the board's jurisdiction. If this part of the route is avoided the board has no jurisdiction. The result is that many of the long route buses are so operated as to avoid paralleling a street railway or operated in parts of the state where street railways are not in operation.

The board says that interstate bus lines are being multiplied without regard to public convenience. It refers to the fact that legislation to provide proper governmental supervision of this business has been under consideration by the commissions of various states, but says it is evident that congressional action may not be had immediately, and that with the rapid growth of the intrastate routes and the addition of the operation of the interstate buses to the present bus and other vehicular traffic the state will be soon confronted with a serious problem of congested traffic on the highways.

The law now provides that the operators of all buses in cities shall carry liability insurance. It recommends:

> We are of the opinion that legislation should be enacted requiring the operators of all interstate buses to carry liability insurance in a reasonable amount for the benefit of persons injured through their operation; that policies for such insurance be filed with the Commissioner of Banking and Insurance, or some other suitable department, and that no operation of interstate buses be permitted in this state unless such requirements be complied with. This we believe is a proper exercise of the police power of the state and is not an interference with interstate commerce. It is a necessary regulation in the interest of the public safety.

Bus Route Supplants a Trolley Line in Youngstown

The Youngstown Municipal Railway, Youngstown, Ohio, suspended service on Jan. 10 on the North Avenue car line, which serves a part of the northern section of the city, and substituted therefor bus service covering the same general section. The trackage taken out of service was 1.35 miles. The street car line was single track with passing switches. This made it impossible to improve service. Service on the line was further handicapped by a difficult grade crossing of the Erie Railroad.

By the operation of the bus line over a recently constructed bridge and for a part of the route through a broader street the handicaps to service have been overcome. The bus route, 2.4 miles in length, also permits of extension of service to a recently developed section of the city heretofore not directly served by the railway lines. The buses used in the new service are the standard city type of the company on White chassis.

Bus Transportation Grows in Madison

The Madison Railways, Madison, Wis., on Jan. 7 purchased all of the equipment of the Wingra Bus Company and will operate that bus line. The Wingra Bus Company for several years has operated an intracity bus line in Madison. The equipment purchased included five large buses. The transfer of ownership was made with the provision that the purchaser will continue fifteen-minute service from the Capitol to Wingra Park. The new line will be run in conjunction with the bus line of the railway. Fifteen-minute service will be furnished from all parts of the city.

Fares will prevail at 10 cents cash for adults and 5 cents for children, with tokens at seventeen for $1 for adults and ten for 50 cents for school children.

Express Service Between Richmond and Petersburg.—A through bus service between Richmond and Petersburg has been established by the Virginia Electric & Power Company. The trip to Petersburg, about 22 miles, consumes one hour. With the exception of stops to be made at the local hotels to pick up passengers, the service is an express service direct to Petersburg. The certificate granted by the Virginia Corporation Commission to operate a bus line was bought by the company recently from C. W. Edgerton, who purchased the right when the line was sold early in December.

Suggests Buses to Recoup Losses.—The Tri-City Railway, Davenport, Iowa, has asked the City Council to authorize the introduction of buses along the streets now served by the Fejervary and LeClaire Street car lines, at the same fare as the street car. Four buses would be regularly operated and six used in peak-load hours, with transfer interchangeable on both lines.

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Financial and Corporate

Agreement on St. Louis Reorganization

Security Holders Reconcile Differences —Hearing on Foreclosure Suit Set by Court for Feb. 15

Security holders of the United Railways, St. Louis, Mo., have agreed on terms for the reorganization of the system. Federal Judge Faris of the Eastern District of Missouri was so informed on Jan. 5. As a result the court continued until Feb. 15 the hearing on the consolidated foreclosure suits brought against the property under which the receivership will be dissolved.

The mill tax debt of $3,000,000 owed the city of St. Louis has not been adjusted, but Judge Faris announced that this would not prove an obstacle to reorganization, since it is a matter for the city and company to settle independently.

The last financial barrier to reorganization was the objection of holders of $30,300,000 of generals 4s to the reorganization committee's plan to extend $8,300,000 of underlying bonds, $4,200,000 of which had been replaced with receiver's certificates. These will be paid off, but it is understood that $6,000,000 of new bonds will provide the capital needed for this purpose.

When Assistant City Counselor Senti informed Judge Faris that the mill tax matter had not been adjusted, the Judge replied:

> The mill tax cannot stop this proceeding. It is either a preferred claim or it is not a preferred claim. I allowed the city to participate here more as a matter of grace than of law.

The reorganization committee has indicated that it will endeavor to compromise the mill tax on the same basis it settled $500,000 in personal injury judgments, namely, payment of 66⅔ per cent of the principal and interest. It will probably ask ten years to pay.

Mr. Mitchell, counsel for the holders of $9,700,000 of St. Louis Transit Company bonds, made a brief statement in which he advised the court of the complete agreement of the security holders. He stated that within ten days he would file an amended bill of foreclosure. Claims against the company will be heard after this and the termination of the receivership will follow a decision as to the payment of these claims. It is probable that the mill tax matter may be adjudicated when the question of claims comes up.

Judge Faris said he hoped the matter would be pushed to a termination with all possible speed.

The reorganization is based on the assumption that the company will be permitted to earn 7 per cent on $57,000,000. The plan provides that the bonded debt be cut to $40,800,000 from $54,890,000. The present $24,913,000 of common stock will largely be wiped out, but holders of $16,383,000 of preferred stock will have an opportunity to subscribe to 343,645 shares of new common at $12.50 per share. Holders of the $9,070,000 St. Louis Transit bonds will receive 53,854 shares of new preferred.

The United Railways went into receivership in April, 1919. Several plans for reorganization were drawn, only to be rejected. In January, 1924, Judge Faris forced the issue by refusing to authorize Receiver Wells to extend three issues of underlying bonds totaling $4,100,000 and two issues of Suburban bonds totaling $6,500,000.

The active reorganization plans for the company were in charge of Newman, Saunders & Company, New York.

The St. Louis Public Service Company filed articles of association with the Secretary of State of Missouri on Jan. 13 and is to take over the properties of the United Railways if the reorganization plans are approved by the federal court and the Missouri Public Service Commission. The purchase of the properties would be at foreclosure sale and the new company would operate the system pending discharge of the receivers. The new company has a nominal capitalization of $15,000, but upon purchase and with the approval of the Public Service Commission additional securities based upon the amount invested in the system as determined by the commission would be issued. The incorporators named in the articles of association are members of the reorganization committee and men employed by them. They are: F. O. Watts, A. L. Shapleigh, J. Sheppard Smith, W. W. Smith, George W. Wilson, W. De W. H. Bradley, S. W. Greenland, L. C. Datz, Thomas Stanion, Stanley Clarke and J. K. Newman. Some of these men will occupy the position of director temporarily pending the election of permanent officers.

Marion & Bluffton Traction to Pass to Insulls

Purchase of four electric light and power and electric railway properties in eastern Indiana by the Indiana Service Corporation, a subsidiary of the Midland Utilities Company, of which Samuel Insull is president, is proposed in a petition filed on Jan. 7 with the Public Service Commission of Indiana.

The properties which it is proposed to merge with that of the Indiana Service Corporation are the Marion & Bluffton Traction Company, Berne Electric Light Company, the Bryant Electric Company and the Wells County Electric Company.

The value of the properties to be purchased is $1,594,197, according to the petition.

With the acquisition of these properties the Indiana Service Corporation will serve 39 communities with electric light and power and 37 towns will be interconnected by the company's electric railroad lines.

Operation of the combined properties will be under direction of Robert M. Feustel, president of the Indiana Service Corporation. No change in the working organization of the companies to be bought is contemplated.

The Marion & Bluffton Traction Company supplies electric service in communities south of Fort Wayne and operates an electric railway from Bluffton to Marion. As the Indiana Service Corporation already owns an electric railroad running between Fort Wayne and Bluffton, purchase of this new line will give the company a railroad connecting Fort Wayne and Marion.

The proposed purchase price of the Marion & Bluffton Traction Company is $1,403,953, subject to first mortgage bonds aggregating $504,000 and equipment gold notes totaling $32,000.

Gain in Traffic in November— Slight Loss for Eleven Months

There was a further and augmented increase in the traffic carried on electric railways during November, 1925, compared with November, 1924. The total number of revenue passengers, including bus passengers, reported to the American Electric Railway Association by 208 companies for the two months was as follows:

November, 1925	777,372,289
November, 1924	754,569,183
Increase	3.02 per cent

For the period of eleven months ended Nov. 30, 1925, compared with the similar period in 1924, the figures are as follows:

1925	8,573,758,955
1924	8,615,448,432
Decrease	0.49 per cent

Dry Dock Road, New York, Passes Interest Payment

The directors of the Dry Dock, East Broadway & Battery Railroad, New York, a part of the Third Avenue Railway System, has adopted the following resolution on the payment of interest on the $649,361 outstanding Series C refunding 5s of the former company:

> Whereas there is due and payable on Jan. 1, 1926, an instalment of interest on the bonds of Series C issued by this company as of July 1, 1915, and secured by the refunding mortgage made and executed by this company as of July 1, 1915; and
>
> Whereas this company has not sufficient funds to pay such interest, and the earnings of this company have been insufficient therefor; now therefore be it
>
> *Resolved*, That the officers of this company be, and they hereby are, directed to make no payment on account of the interest due Jan. 1, 1926, on the said Series C bonds of this company.

Requiem Sung for Phoenix Company

The Phoenix Railway, Phoenix, Ariz., was granted a judicial decree of dissolution by Judge Joseph F. Jenckes in the Maricopa County Superior Court on Dec. 29. The properties of the company were sold to the city of Phoenix not long ago for $20,000.

The petition for the decree was signed by the nineteen stockholders of the passing corporation. It was incorporated 43 years ago for $2,000,000, consisting of 20,000 shares of stock at a par value of $100. The petition for the decree, according to the local attorneys for the Sherman interests, has no significance other than the desire officially to close the business of the corporation.

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$3,956,494 Net Income at Detroit

Accountants for Municipal Line Give This Figure of Operating Results for Period from Jan. 1, 1924, to June 30, 1925, Including $1,555,183 for Renewals and Replacements

THE third annual report of the Department of Street Railways at Detroit, Mich., for the fiscal year ended June 30, 1925, has just been issued. According to the audit by Price, Waterhouse & Company the net income from Jan. 1, 1924, to June 30, 1925, was $3,956,494. The report gives operating data for the fiscal year, but the audit shows the financial results covering the eighteen months period and is a continuation of the audit by Price, Waterhouse & Company as of Dec. 31, 1923.

The financial review contains also an audit by Price, Waterhouse & Company, giving $7,114,246 as the amount of "Surplus and Reserves," representing the city's equity in the street car lines after providing for accrued depreciation on the property to June 30, 1925. Without allowing for depreciation, this equity is fixed at $10,241,771. This latter sum is made up as follows: Debt retired from operation, $3,367,885; sinking fund reserves, $4,762,790; additions to property, $2,111,096.

The annual report shows that the D.S.R. had on June 30, 1925, 359.14 miles of running track, 2.51 miles of sidings, 5.87 miles of carhouse tracks under cover and 23.43 miles in the open, making a grand total of 390.95 miles. The total mileage embraced in the motor coach system as of the same date, one-way route-miles, is given as 49.14 for the thirteen routes.

Scope of the Audit

It is pointed out that the department furnishes transportation facilities for the cities of Detroit, Highland Park, Hamtramck and Springwells (now Fordson). Ninety coaches were purchased during the year and 89 coaches were being operated on June 30, 1925, with a combined seating capacity of 1,953 passengers.

The audit was so conducted as to enable the auditors to certify to the general accuracy and integrity of the accounts. The examination was stated to be of such a nature as would determine the substantial accuracy, or otherwise, of the accounts and records, but was not of such a detailed character as would necessarily disclose minor irregularities or inaccuracies, should any exist. The work of the auditors comprised: (a) A verification of the assets and liabilities as of June 30, 1925; (b) a verification of the results from operations during the period from Jan. 1, 1924, to June 30, 1925; (c) an examination of the disbursement vouchers taken up in the accounts during the period from Jan. 1, 1924, to June 30, 1925.

As a result of the auditors' examination and after making certain adjustments necessary to correct the book figures, including a charge of $1,555,183 in respect of depreciation and accruing renewals of the properties, it is found, as indicated previously, that the operations of the period from Jan. 1, 1924, to June 30, 1925, resulted in a net income of $3,956,494. It is pointed out that a considerable number of street cars acquired from the Detroit United Railway under the purchase agreement have been abandoned or retired from service. Inasmuch as the consideration under the purchase agreement represented a composite consideration rather than a total of amounts representing the purchase price of individual assets, the book adjustment necessary in order to relieve the property account of the value of such abandoned equipment was determined on the basis of the arbitrary valuations ascribed thereto by the equipment division at the time of acquisition. Using such as a basis a loss was developed (after allowing for accrued depreciation) amounting to $158,410, and this has been charged direct to surplus in the accounts by reason of the fact that the retirement from service of the rolling stock had merely been deferred to the period under review.

No specific provisions for depreciation have been made in the accounts of the department up to June 30, 1925, but alternatively, the total cost of the properties is being amortized by appropriations of income in respect to sinking funds for debt retirement and of equipment purchased fund.

In the accounts Price, Waterhouse & Company have given effect to a provision for depreciation calculated on the basis of 3 per cent per annum of the book value of the depreciable properties and for the period of operation to June 30, 1925, the reserve calculated on this basis amounts to $3,087,484, of which slightly more than one-half, or $1,555,183, has been charged against the operations for the period of eighteen months ended June 30, 1925.

In their report on the accounts for the period ended Dec. 31, 1923, they calculated depreciation on the basis of 2½ per cent per annum, calculated on the book value of the total property investment, which naturally included non-depreciable properties. They report that they have since been advised by recognized engineering authorities that a rate of 3 per cent per annum applied on the depreciable property would be fair and they have, therefore, adopted this rate. Furthermore, it is understood that it is the intention of the department to give effect in the accounts to the depreciation provisions as calculated to date and to make a relative provision monthly hereafter. The accountants say:

> It will be understood, of course, that the creation of this depreciation reserve is in effect merely a transfer to a separate account of parts of what otherwise would be stated as surplus and it is not specifically offset by a corresponding appropriation of cash available for replacement as and when required. The depreciation reserve in this instance is wholly offset by sinking fund investments, which will be applied toward the payment of the cost of the properties.

In discussing the procedure of accounting for expenditures in connection with rehabilitation on which the department's records show $1,965,287 has already been spent, it is stated that "in the present instance the necessity for a prompt survey and report on the rehabilitation of the property acquired from the Detroit United Railway is very apparent. The longer this work is delayed the greater will be the difficulty of separating the rehabilitation costs from the costs chargeable to maintenance applicable to the period subsequent to the date of acquisition on May 15, 1922."

It was recommended in the report on the examination at Dec. 31, 1923, that a rehabilitation budget be promptly prepared by the engineering department and formally adopted by the Board of Street Railway Commissioners so that the basis of future accounting in this respect will be definitely established. It is understood that such a budget has not yet been prepared.

The assessed valuations of the department's properties (exclusive of sundry leased properties) for personal and real estate tax purposes for 1925 in Detroit, Highland Park, Hamtramck, Grosse Pointe and Fordson was $27,678,622. By a comparison of the total assessed valuation with the depreciated value of the property accounts as shown by the balance sheet as of June 30, 1925, of $39,498,853 it will be noted that the assessed valuation amounts to approximately 70 per cent of the depreciated value of the properties.

Statement of Funded Debt

At June 30, 1925, there were outstanding the following funded debt and purchase money obligations, viz.: Construction bonds, $15,000,000; purchase bonds, $3,601,000; additions and betterment bonds, $1,450,000; Detroit United Railway purchase contract, $14,080,000. In addition, pending the sale of $3,500,000 additions and betterment bonds, the department was indebted to the city of Detroit in the amount of $2,602,286, borrowed for the purpose of liquidating liabilities for additions and betterments.

In commenting on sinking fund and reserves, the report states that with regard to the construction bonds, amounting to $15,000,000, the Department of Street Railways is making sinking fund provisions in accordance with that section of the charter which requires payments to be made into the sinking fund aggregating 75 per cent of the principal by the maturity date of each series. There was, on June 30, 1925, in respect to this issue an over provision of $340,484.

Maturity of the purchase bonds and of the additions and betterments bonds is being anticipated by setting aside monthly amounts calculated on the basis of days which will equal the principal of each series of bonds as they repectively become due. Interest on these funds is taken up as an earning in the income account. Since the additions and betterment bonds become due in equal amounts annually and the purchase bonds become due in approximately equal amounts annually, this method of setting aside the funds for their redemption is considered as practical as could be suggested.

The reserve for injuries and damages, amounting to $1,383,379, has been

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TOTAL PASSENGERS CARRIED ON DETROIT MUNICIPAL LINES

	Rail Lines	Coach Lines	Total
Year ended June 30, 1923	471,070,493	218,622	471,289,115
Year ended June 30, 1924	481,729,567	429,231	482,158,798
Year ended June 30, 1925	454,036,811	4,171,585	458,208,396

REVENUE RIDES ON DETROIT MUNICIPAL LINES

Year	Population	Rail Lines	Coach Lines	Together	Revenue Rides per Capita of Population per Annum
1923	1,219,275	357,386,437	218,622	357,605,059	293
1924	1,310,169	367,120,260	429,231	367,549,491	281
1925	1,401,064	338,155,230	4,171,585	342,326,815	244

STATISTICS OF DETROIT MUNICIPAL LINES FOR THE YEAR ENDED JUNE 30, 1925, COMPARED WITH THE YEAR ENDED JUNE 30, 1924

Statistics	Year Ended June 30, 1925	Year Ended June 30, 1924
Railway revenue car-miles	48,300,107	50,401,902
Coach revenue coach-miles	1,218,307	85,492
Railway revenue car-hours	5,252,021	5,653,643
Railway revenue passengers	338,155,230	367,120,260
Railway transfer passengers	115,881,581	114,609,307
Railway total passengers	454,036,811	481,729,567
Coach revenue passengers	4,171,585	429,231
Total passengers	458,208,396	482,158,798
Railway operating revenue per car-mile, cents	44.02	44.75
Coach operating revenue per coach-mile, cents	24.44	27.36
Railway operating expenses per car-mile, cents	31.60	32.43
Coach operating expenses per coach-mile, cents	24.64	28.03
Railway operating revenue per car-hour	$4.05	$4.00
Railway operating expenses per car-hour	$2.90	$2.89
Ratio of transfer passengers to revenue passengers—Railway, per cent	34.27	31.21
Railway revenue passengers per car-mile operated	7.00	7.27
Railway transfer passengers per car-mile operated	2.40	2.27
Total railway passengers per car-mile operated	9.40	9.54
Coach revenue passengers per coach-mile operated	3.42	5.02
Ratio of railway operating expenses to railway operating revenue, per cent	71.77	72.46
Ratio of coach operating expenses to coach operating revenue, per cent	100.81	102.43

CONDENSED STATEMENT OF INCOME OF DETROIT MUNICIPAL LINES FOR THE PERIOD FROM JAN. 1, 1924, TO JUNE 30, 1925 (CENTS DISREGARDED)

Revenue	Half Year Ended June 30, 1924	Year Ended June 30, 1925	Together
From transportation	$11,256,127	$20,956,023	$32,212,150
From other railway operations	250,769	605,803	856,573
Total operating revenues	$11,506,897	$21,561,826	$33,068,724
Deduct—Operating expenses	7,941,992	15,590,261	23,530,254
Net revenue from operation	$3,564,904	$5,971,565	$9,536,469
Deduct—Taxes assignable to railway operations and miscellaneous rents paid	357,797	704,467	1,062,265
Balance, operating income	3,207,107	5,267,097	8,474,204
Add—Non-operating income	62,427	159,479	221,906
Gross income before interest charges, depreciation, etc	$3,269,534	$5,426,577	$8,696,111
Deduct—Interest and miscellaneous charges	1,051,407	1,995,081	3,046,488
Income before depreciation and loss in inventory value as at June 30, 1925	$2,218,127	$3,431,495	$5,649,623
Deduct—Provision for depreciation of property	498,890	1,056,293	1,555,183
Income after depreciation but before loss in inventory value as at June 30, 1925	$1,719,236	$2,375,202	$4,094,439
Deduct—Loss in value of material and supplies on hand at June 30, 1925, as developed by physical inventory	.....	.....	137,944
Net income for the period			$3,956,494

STATEMENT OF DISPOSITION OF INCOME OF DETROIT MUNICIPAL LINES

Revenue	Half Year Ended June 30, 1924	Year Ended June 30, 1925	Together
Income for the period after provision for depreciation but before deducting loss in inventory value at June 30, 1925, as above	$1,719,236	$2,375,202	$4,094,439
Deduct—Sinking fund and other appropriation in excess of provision for depreciation:			
Sinking fund provisions for payment of funded debt and purchase obligations—			
For construction bonds (exhibit IX)	$283,327	$571,351	$854,679
For purchase bonds (exhibit X)	65,953	133,000	198,953
For additions and betterments bonds (exhibit XI)	4,109	50,000	54,109
For purchase contract—			
On semi-annual installments (exhibit XII)	497,267	918,885	1,416,152
On final payment (exhibit XII)	392,143	786,441	1,178,584
Appropriation of income to equipment purchase fund reserve	.....	311,791	311,791
Together	$1,242,801	$2,771,469	$4,014,271
Deduct—Provision for depreciation of property	498,890	1,056,293	1,555,183
Excess of sinking fund and other appropriations from income over provision for depreciation	$743,911	$1,715,176	$2,459,087
Income for the period before deducting loss in inventory value, less sinking fund and other appropriations (in which is included provision for depreciation) as at June 30, 1925	$975,325	$660,026	$1,635,351
Deduct—Loss developed upon determination of value of physical inventory of material and supplies on hand as of June 30, 1925	.....	.....	137,944
Amount transferred to surplus (exhibit I)			$1,497,407

created by monthly charges against earnings of amounts equivalent to 3 per cent of the passenger revenue to provide for the settlement of claims against the department arising from accidents. On this point the report says:

> Larger percentages of income are being set aside for this purpose in most cities in which the operating conditions might be considered to be fairly comparable with the conditions in Detroit. However, it is the established practice of the department to charge against the reserve only the payments made in settlement of claims and to charge directly into operating expenses all expenses of conducting the claims division, including hospital and medical charges, workmen's compensation, payments, legal and court expenses, etc.

With reference to the adequacy of this reserve of $1,383,379, information obtained from the claims division indicates the reserve is more than 100 per cent in excess of the indicated requirements at that date.

While up to June 30, 1925, it was not the practice of the department to set aside funds for the specific purpose of liquidating claims for injuries and damages, the basis of accounting has now been changed in this respect and appropriations of cash are now being made for the purpose of liquidating liabilities of this nature.

The total insurance and surety coverage carried by the department on June 30, 1925, was $12,463,800.

Passenger Revenue

During the period covered by this examination, the following rates of fare were effective:

Street Car Service.—Cash fare of 6 cents or nine tickets for 50 cents and 1 cent additional for transfers to other street car service.

Motor Coach Service.—"Belle Isle" Service—Cash fare of 5 cents without transfer privilege. "Lynch Road" Service—Cash fare of 6 cents or nine tickets for 50 cents and 1 cent additional for transfers to street car service.

(Note—This motor coach service was replaced by street car service during the period under review).

Other services.—Cash fare of 10 cents with free transfer privilege only on such street car lines as were fed directly by motor coach service. For the privilege of making an additional transfer on the street cars, a further charge of 1 cent was made. Upon presentation of a transfer from street car service, an additional charge of 4 cents was made for motor coach service, making a total fare of 10 cents for street cars and coach service.

The balance sheet as of June 30, 1925, records total assets of $50,722,915. This sum includes $42,586,337 as property account invested in road and equipment; total investments of $5,366,435; working assets of $1,478,531; total current assets of $1,149,493, and total deferred charges to future operations of $142,117. The liabilities include total funded debt and purchase money obligations of $34,131,000; total current liabilities of $5,006,804; reserve for injuries and damages amounting to $1,383,379, and reserve for depreciation of property of $3,087,484. The total surplus and reserves amounted to $7,114,246.

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Personal Items

Changes in East St. Louis

Messrs. Welsh, Gregory and Rearden Advanced Before W. H. Sawyer's Departure for Australia

In line with the proposed departure of W. H. Sawyer, president of the East St. Louis & Suburban Railway, East St. Louis, Ill., to Australia for the purpose of making an electrical survey, personnel promotions have been announced which are at the same time a recognition of men's services and worth. G. W. Welsh has been elected vice-president of the East St. Louis Railway, the East St. Louis & Suburban Railway and the St. Louis & Belleville Electric Railway; T. W. Gregory has been elected vice-president and assistant secretary and Col. Frank L. Rearden has been elected assistant treasurer of the same lines.

G. W. Welsh

Before his recent promotion Mr. Welsh was assistant to the president of all the railway properties in the group. He was appointed to this position in August, 1924. Ten years before that he had become connected with the East St. Louis & Suburban group of properties in East St. Louis as superintendent of power. He continued in that position until 1919 when he was made chief engineer. Mr. Welsh received his education at Lehigh University where he was graduated with the degree of electrical engineer in 1901. In that year he became identified with the General Electric Company in the testing department, specializing in electric railway work up to 1905. For the next four years he was employed with the New York Central Railroad in connection with the electrification of the Grand Central Terminal in New York City. This electrification job led to another and we next find him with the Southern Pacific Company, San Francisco, Cal., working on the electrification of its suburban lines on the eastern side of San Francisco Bay in Oakland and Berkeley. His title here was assistant electrical engineer. After four years of this work he went with the East St. Louis properties.

T. W. Gregory, the other new vice-president, entered the service of the East St. Louis properties as bookkeeper on July 1, 1902, and four months later was elected assistant secretary and assistant treasurer of the various companies then comprising the system and was elected to a similar office with other companies acquired after that date. Back in 1887 Mr. Gregory, a native of Pomona, Ill., entered the service of the Mobile & Ohio Railroad at Mill Creek, Ill., as telegraph operator. He was employed in that capacity and as station agent at various points on that line between East St. Louis and Cairo until he went to the East St. Louis freight office in 1890 and to the East St. Louis & Suburban Railway and affiliated companies in 1902. With the exception of a period of less than six months in 1892 with the Louisville, New Orleans & Texas at Greenville, Miss., now the Yazoo & Mississippi Valley, his employment for 38 years has been with two interests. On Dec. 22, 1925, Mr. Gregory was appointed receiver of the Alton, Granite & St. Louis Traction Company and on Dec. 31, 1925, was appointed receiver of the Alton Gas & Electric Company.

Col. F. L. Rearden, the new assistant treasurer, was formerly the auditor of the companies.

Mr. Sawyer, president of the railway companies in the East St. Louis group, expects to sail on Feb. 2 in company with H. W. Eales, St. Louis, to make a survey of electric power resources in the Antipodes. Reference was made to this proposed undertaking in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 9, 1926, page 90.

E. C. Hathaway Resigns from Inspection Company

E. C. Hathaway, chairman of the board of directors of the Railway Audit & Inspection Compay, Inc., Philadelphia, has disposed of his interests in the company and will no longer be associated with it. Mr. Hathaway was formerly president of the company. He is well known among electric railway men. For some time prior to 1916 he was assistant general manager of the Virginia Railway & Power Company, Richmond, Va., in charge of the properties of the company in Norfolk. He served with that company more than fifteen years. Before that he was with the Railways & Light Company of America, with headquarters in Baltimore. This company controlled the public utility properties located in Norfolk, Knoxville, Lexington and other cities.

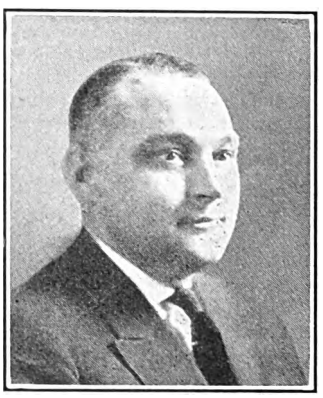
The Railway Audit & Inspection Company was organized by Mr. Hathaway about 1906, and grew steadily from that time until in 1916 he felt that its conduct demanded his undivided attention. He has a number of important interests other than this and it is understood that he will in the future devote his time largely to them.

A. L. Reynolds in Florida

Washington-Virginia Railway Receiver With Miami Road Under Electric Bond & Share

Arthur L. Reynolds has been made superintendent of railways and motor coach operation of the Miami Beach Railway, Miami, Fla., which also holds a management contract with the city for operation of its cars and buses. Mr. Reynolds is thus placed in charge of the entire transportation system of Miami and the line to Miami Beach. Twenty new cars and 24 buses have recently been added to these properties to care for its rapid growth due to the recent Florida popularity. The Miami Beach Railway is owned by the Florida Power & Light Company, controlled through stock ownership by the American Power & Light Company and is under the Electric Bond & Share Company supervision.

Mr. Reynolds was formerly general manager for the Washington-Virginia Railway and since its receivership has been receiver as well. He will continue as receiver of that property. Before he went to Washington Mr. Reynolds was manager of the Youngstown & Suburban Railway, Youngstown, Ohio, under the management of Day & Zimmermann, a position to which he was appointed in March, 1921.



A. L. Reynolds

Mr. Reynolds began his railway career in the operating department of the Northern Ohio Traction, Light & Power Company in 1907. The following year he took a position as a salesman with the B. F. Goodrich Company, and after remaining with that concern for a year again took up railway work with the operating department of the Twin City Rapid Transit Company as supervisor of transportation. Before the entrance of the United States into the war in 1917 Mr. Reynolds went to the Second Officers' Training Camp at Fort Snelling, Minn. He received a commission as first lieutenant in the infantry.

Upon his return to civil life in 1918 he re-entered the service of the Twin City Rapid Transit Company, Minneapolis. During the latter part of 1918 he conducted for the company many public meetings in connection with its campaign to explain to the people the cost-of-service franchise which the company was seeking to obtain from the city. This

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measure was defeated at that time owing to the peculiar political situation, but the matter has since been settled along somewhat similar lines.

In 1919 Mr. Reynolds was again transferred to the St. Paul Division of the Twin City Rapid Transit Company, and while with that company he acted as supervisor of three of the heaviest interurban lines between St. Paul and Minneapolis and also in various other capacities.

Mr. Reynolds was born in 1886 in Ashland, Ohio. He received his education in the grade schools of Akron, Ohio, and later attended Kenyon Military Academy at Gambier, Ohio. He is a graduate of Kenyon College, also in Gambier.

J. W. Nicholson Succeeds Mr. Becht at Cincinnati

The resignation of A. J. Becht, secretary of the Cincinnati Street Railway, Cincinnati, Ohio, for more than fifteen years, has been accepted. Miss M. A. Cannon, assistant secretary, also has resigned. The action was in accordance with Mr. Becht's request at the time the railway took over its property from the Cincinnati Traction Company on Nov. 1 last year that he be permitted to retire as secretary on Jan. 1, 1926. He explained that he desired to devote all of his time to his other business and personal interests.

J. W. Nicholson

Following the acceptance of the resignations the board elected Joseph W. Nicholson secretary and Miss Caroline Hein as assistant secretary. Mr. Nicholson started with the Ohio Traction Company in 1911 as a stenographer. The Ohio Traction Company owned the Cincinnati Traction Company at that time. In 1920 Mr. Nicholson was made secretary of the Ohio Traction Company, succeeding Walter A. Draper, who then became vice-president. In 1922 he was elected secretary of the Cincinnati Traction Company in recognition of talent which he was quick to display and now succeeds Mr. Becht as secretary of the Cincinnati Street Railway.

Mr. Becht will devote himself to the interest of the Kilgour-Cunningham estate. He is an officer of the Toledo, Bowling Green & Southern Traction Company and of the Cincinnati & Hamilton Traction Company.

A. W. McClimont President

A. W. McClimont, for the past eight years vice-president and general manager of the Winnipeg Electric Company, Winnipeg, Man., has been elected president of the corporation, succeeding George W. Allen, K.C.

W. R. Bawlf of Winnipeg has been elected vice-president. W. H. Carter of Winnipeg and James B. Woodyat of Montreal have been elected directors.

Mr. McClimont, it is understood, will continue to hold the position of general manager.

Rumors About Mr. Dunbar Denied

Emphatic denial has been made by official circles in Philadelphia Rapid Transit Company affairs that W. C. Dunbar has resigned as president as stated in a signed article in a Philadelphia morning newspaper a few days ago. Furthermore it was officially stated the officers of the company resented the inference that President Dunbar welcomed the transfer to Detroit. It was made known at the time Mr. Dunbar went to Detroit he was loaned to Dillon, Read & Company, New York, to help straighten out the situation on the Detroit United Railway. In recent years Dillon, Read & Company have financed both the Philadelphia Rapid Transit and the Detroit United and Mr. Dunbar's selection to assist at Detroit was merely a reflection of the appreciation on the part of the bankers of his experience and abilities.

Frank W. Funk Succeeds C. I. Crippen at Youngstown

After an absence of several years Frank W. Funk has returned to the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, as assistant to General Manager MacCalla. In this capacity the former associate of C. I. Crippen on the Pennsylvania-Ohio System succeeds Mr. Crippen, who has left the organization to assume the executive supervision of a group of utilities that center in the Pennsylvania Gas & Electric Corporation. Mr. Crippen's new connection was referred to in the ELECTRIC RAILWAY JOURNAL issue of Dec. 12, 1925, page 1056.

Mr. Funk entered the service of the Pennsylvania-Ohio Electric System early in 1914 as electrical engineer in charge of operation and construction. After three years in that position he was appointed resident engineer of the Republic Engineers, Inc., and two years later, with the man whom he now succeeds, formed the consulting engineering firm of Crippen & Funk. He has continued in general industrial and consulting engineering work since that time.

Mr. Funk entered the Ohio State University, taking the course in electrical engineering. After he was graduated in 1908 he went direct to the West Penn Power Company on construction work at Connellsville, near Scotdale, Pa., the place of his birth. He remained there six months, when he joined the development staff of the Westinghouse Electric & Manufacturing Company. He continued with the Westinghouse for about four years, having a part in many important electrical development jobs. Among these was control work in connection with the electrification of the Pennsylvania Railroad terminal at New York, and electrification work on the New York, New Haven & Hartford Railroad.

In 1912 he turned to the public utility field to become assistant electrical engineer of the Northern Ohio Traction & Light Company at Akron. Here he took part in the work of designing and constructing the Gorge power station and other important projects. Later he was made assistant superintendent of motive power in charge of all electrical operation and maintenance and was assistant in steam operation.

H. M. Atkinson Most Valuable Citizen of Atlanta

Henry Morrell Atkinson, chairman of the board of directors of the Georgia Railway & Power Company, contributed in the past twelve months more of inspired, effective and unselfish work for the betterment of the community of Atlanta, Ga., than any other citizen. To him will be awarded the silver loving cup given annually by the *Georgian and Sunday American* for playing the rôle of Atlanta's most valuable citizen in 1925. The committee's selection, according to the announcement, was based on Mr. Atkinson's activities in industrial development of the North Georgia region, of which Atlanta is the center, through great water-power plans, two of which were completed in 1925 and another projected. His efforts to improve transportation facilities in and around Atlanta and his general record of service for the communities and region development were also cited by the committee.

H. M. Atkinson

Mr. Atkinson has been identified with nearly all the important electrical projects that have been put through at Atlanta for more than 25 years and has contributed much to the city's growth and prosperity. He was instrumental in consolidating the railways and lighting companies of Atlanta into the Georgia Railway & Electric Company. He also organized the Georgia Railway & Power Company, which began operating in 1912, and became chairman of the board of directors of that company at the time of its organization. This

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position he has held up to the present time. In addition to electrical enterprises he organized, built and was the first president of the Atlanta, Birmingham & Atlantic Railroad, a steam property, which has contributed to the development and prosperity of those sections of Georgia and Alabama served by it. Mr. Atkinson has also found time to take an active interest in the cultural and social life of the community.

E. K. Miles Assistant Superintendent at Syracuse

F. R. Latta has resigned as assistant to the general superintendent of the Syracuse lines of the New York State Railways, Syracuse, N. Y. His resignation became effective on Jan. 1. E. K. Miles, division superintendent, will succeed to the post of assistant to the general superintendent, J. E. Duffy.

Owing to this change three appointments have been made necessary. John Flood, formerly an inspector at Warren and Fayette Streets, becomes division superintendent at the Tallman Street yards. E. F. Wombles, station master at Wolf Street, becomes inspector in place of Mr. Flood, and J. E. Whalen, formerly an outside man at Wolf Street, becomes station master.

Dr. W. A. Rigg Heads Interstate Railways

Dr. Walter A. Rigg has been elected president of the Interstate Railways, Camden, N. J., succeeding his father, John A. Rigg, who died on Jan. 2. Dr. Samuel B. Rigg, another son, became a member of the board of directors. Daniel Houseman, vice-president of the Real Estate Title Insurance & Trust Company, was elected vice-president of the Interstate Railways, succeeding Dr. Walter A. Rigg in that office.

The Interstate Railways is not an operating company. It is largely a disbursing agent for the moneys received under the terms of rentals of properties leased by it for operation by others.

H. M. Gould with Dodge Brothers

H. M. Gould, who resigned late last year as assistant general manager of the Department of Street Railways at Detroit, Mich., is now identified with Dodge Brothers, automobile manufacturers of Detroit, Mich. Mr. Gould was one of the first employees to join the Detroit Street Railway Department. He had been engaged on the municipal line since 1920, when he joined the operative personnel as electrical engineer to supervise electrical construction work. At that time the system was under the direction of former Mayor James Couzens. He was made assistant general manager in the fall of 1924, at which time his career was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 4, page 574. His promotion at that time was considered a tribute to his grasp of the electric railway problems, which went far beyond his technical training as an electrical engineer. Before going to Detroit he was with the Connecticut Company.

C. E. Newcomer Manager at Pheonix

Charles E. Newcomer, connected for several years with the Phoenix Railway, Phoenix, Ariz., will serve the city as chief clerk of the municipal transportation lines. The position of general manager, held for many years by Sam H. Mitchell, was abolished early in December when it became definitely known that the city would assume operation and control of the lines. City Manager Rieger stated that the City Commission was in full accord with the decision, made in the interest of economy, and that several of the members felt that the salary paid to Mr. Mitchell as general manager is exorbitant in the case of a concern which was sold "lock, stock and barrel" for $20,000.

Obituary

E. V. Goble

Ernest V. Goble, superintendent of the schedule department of the Grand Rapids Railway, Grand Rapids, Mich., died on Dec. 28 at St. Mary's hospital after an operation. Mr. Goble became connected with the Grand Rapids Railway in April, 1924, as head of its schedule department. He was well known throughout the Middle West in railway circles. His railway training was received in Minneapolis, where he had been employed by the Twin City Rapid Transit Company for many years. He had come up through the ranks from platform man. Mr. Goble was 37 years old last Christmas.

A. W. Jones

Arthur Winslow Jones, manager of the Far East department of the International General Electric Company since its formation in 1919 and a member of the advisory committee of the company, died at Schenectady, N. Y., on Dec. 26. Mr. Jones had general direction over activities of the company in Japan, China, Australia, South Africa, India, Philippine Islands and Dutch East Indies. Previous to the formation of the International General Electric Company in 1919, he was a director on the boards of different foreign selling companies. In 1888 he entered the employ of the Thomson-Houston Company in Lynn, Mass., and in 1891 was made chief engineer of the International Thomson-Houston Company.

Frank E. Chapin

Frank E. Chapin, general manager of the Peninsular Railway, San Jose, Cal., for the past twenty-two years, died on Jan. 5 at the Southern Pacific Hospital, San Francisco. He entered railway work in 1874 with the old Market Street Railway system in San Francisco. Removing to Stanislaus County he was employed by the La Grange Hydraulic Ditch Mining Company for four years and when he went back he joined the California Street Railroad in 1870 as a conductor and also as a gripman. Later he was made starter and then assistant superintendent. This office he held from 1882 to 1904. In 1904 he went to San Jose as general manager of the San Jose & Los Gatos Interurban Railroad. This road was merged with the Peninsular Railway and then the company purchased all the city lines of San Jose and incorporated them under the name of the San Jose Railroad.

Mr. Chapin's advice on railway operating and engineering problems was sought by railroad men not only within the limits of California but throughout the country. He was born in Tuolumne County, California, 69 years ago.

Joel Hurt, Sr.

Joel Hurt, Sr., pioneer electric railway operator, capitalist and business man at Atlanta, Ga., died at his home there on Jan. 10. He played a prominent part in the rebuilding of Atlanta after the civil war. In 1894-95 he was president of the American Electric Railway Association.

One of the first successfully operated electric railways in the world was built by Mr. Hurt in 1889, running from Inman Park to Atlanta. His planning and development of the suburban sections of Inman Park and Druid Hills were two of his many contributions to the improved living facilities of the Atlantans. He consolidated the city's street railways and in 1901 sold them to interests that later chartered the Georgia Railway & Electric Company.

His activities of the '90s were concerned with the organization of the Trust Company of Georgia, the presidency of which he held for eleven years. In 1892 he built the Equitable Building, the first fireproof office structure in the South.

Mr. Hurt was born at Olivet, Ala., July 31, 1850. After the war he worked his way through college, and took an engineering degree at the University of Georgia in 1871. For the next four years he was engaged in railroad construction and then entered real estate and insurance in Atlanta. His labors thereafter touched nearly every form of the development of the city of Atlanta.

Ralph D. Hood

Ralph D. Hood, vice-president and general manager of the Massachusetts Northeastern Street Railway and the Dover, Somersworth & Rochester Street Railway, died at the Hale Hospital in Haverhill, Mass., on Jan. 9, after an operation following pneumonia. He was one of the most widely-known electric railway men in the Northeast and was universally esteemed in New England traction circles.

Mr. Hood was president of the New England Street Railway Club for the year 1923-1924. He was a native of Massachusetts. He was educated in the public school and at Phillips-Andover Academy and was an engineer by profession. He served as rodman in the Haverhill City Engineer's office in 1891. Next he became transit man for the Haverhill & Amesbury Street Railway, serving that company in 1892 and 1893. He was engineer for the Haverhill, Georgetown & Danvers Street Railway in 1894-1895 and then in turn served in a similar capacity with the Exeter Street Railway, 1897; Ex-

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eter, Hampton & Amesbury, 1899-1900; Massachusetts Construction Company and Lowell System, 1900-1903; Manchester & Haverhill Street Railway, 1904.

In 1905 he was office engineer for the El Paso & Durango Railroad and in 1906 engineer of the Rockingham racetrack. He was with the Manchester & Derry Street Railway in 1907 and the Dover, Somersworth & Rochester Street Railway and allied companies from 1908 to 1911. On Jan. 1, 1911, Mr. Hood became superintendent of highways for the city of Haverhill and on Jan. 1, 1912, was elected a member of the Municipal Council of Haverhill and served as head of Department of Streets in 1913. He became engineer of maintenance of way of the Massachusetts Northeastern Street Railway and allied companies in 1914, continuing as such to 1917, when he was made vice-president and general manager of these companies.

In addition to his public service in 1911-1913, he has been chairman of the Haverhill Board of Survey from 1917 to date. He saw military service as an officer in the National and State Guards from 1904 to 1919, being promoted successively from Second Lieutenant to Major.

William G. Busby, former chairman of the Missouri Public Service Commission, died at his home in Kansas City, Mo., on Jan. 4. He had been ill for nine months. His death followed a third stroke of paralysis. When the Missouri Public Service Commission was created, in 1911, Gov. Elliott W. Major named Mr. Busby to the commission. Later he was elected chairman and held that post six years. Mr. Busby served as State Senator from 1908 until 1913. He was formerly Mayor of Carrollton, Mo.

William Brownlee Albright, a director of the Sherwin-Williams Company, Cleveland, Ohio, died suddenly on Dec. 28, while visiting in Cleveland. Mr. Albright had been closely associated in both a business and personal way with most of the railroad officials in New York City, and numbered among his friends many of the most prominent railroad men in the United States. He started with the Sherwin-Williams Company in January, 1885. Mr. Albright was born in Philadelphia on July 17, 1855. For the past twenty-five years he has made his home in New York.

Joshua B. Lascell, at one time superintendent of the Charlotte line at Rochester, N. Y., died recently. When the railroad was built from Charlotte to the Ridge Road in 1889 he was made assistant superintendent and later became superintendent, which position he held until the road was merged with the Rochester lines. Mr. Lascell continued with the line until last August, when he retired. He was born 70 years ago in Niagara County, New York.

Benjamin Hudson Ryder, electrical engineer of the American Steel & Wire Company for the past 24 years, died suddenly on Dec. 26. He was widely known in the electrical and railroad circles of the country. Mr. Ryder was born in Hudson, N. Y., on Dec. 3, 1877.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Brisk Foreign Interest in American Equipment

Representatives of National Pneumatic Company, Recently Returned from Abroad, Very Optimistic

Experience of the National Pneumatic Company in developing foreign business indicates a broadening opportunity for American car equipment manufacturers. In the various countries of the Far East, continental Europe and in England interest is growing in the improvement of electric railway cars and in the application of modern American devices.

T. W. Casey, vice-president, and P. R. Foreman, general manager and chief engineer of the National Pneumatic Company, have recently returned after an extended foreign trip. Mr. Foreman visited Japan and continued west from that point until he joined forces with Mr. Casey in Paris, after the latter had proceeded east to England and continental Europe.

Foreign railways were found very much interested in the improvement of car equipment and in the application of pneumatic door control.

In Japan Mr. Foreman completed arrangements under which National Pneumatic devices will be manufactured in that country by the Mitsubishi Denki K. K. under National Pneumatic patents. Negotiations are now under way with the Imperial Government Railways and other lines in Japan looking to the installation of pneumatic door control apparatus.

In France the Chemin de Paris-Orleans, which has begun the electrification of its lines, is putting into service a sample installation of pneumatic door equipment. The cars are equipped with folding doors and are arranged for the interchange of passengers at platforms of different levels. Consideration is being given to the matter of equipping 120 cars with pneumatic door control.

An order for 50 car sets of pneumatic engines and control has been received for Bucharest in Rumania. These are for street car service and the design arrangement closely follows American door control practice.

In Berlin the Nord Sud subway cars are initiating the installation of pneumatic doors by equipping eight cars. These doors will be of the sliding type. The decision was dictated by the desire to increase speed and safety while at the same time reducing train operating costs. The Hochbahngesellschaft is watching the Nord Sud installation carefully from the standpoint of its own operating conditions.

Installation of pneumatic door control has made considerable progress in Spain. On the surface lines in Barcelona 62 cars of the center-entrance type have been in service with pneumatic door equipment for a period of approximately two years. Experience with these cars has been so satisfactory that future equipment will probably be of this type. The question of remodeling some of the older cars is being considered in comparsion with the advantages of new equipment.

Preparations are being made to open the first section of the new Barcelona subway. Cars for this service are being completed. They closely follow modern American practice and incorporate full pneumatic door equipment for the operation of twelve sliding doors per car, six on each side.

Interest in rehabilitation and improved equipment is also reported in England and London. The London Underground has in service a large number of pneumatically equipped cars. The London United Tramways, Ltd., has three cars in service equipped with automatic rear exit treadles.

Ohio Brass Holds Annual Sales Meeting

Field forces of the Ohio Brass Company gathered at Mansfield, Ohio, on Jan. 11 for their annual sales conference, which extended through the week. A daily program of meetings was held at the Mansfield plant up to Thursday night. Friday and Saturday were spent at the insulator plant in Barberton.

A careful analysis of Ohio Brass products is one of the features of these meetings. In addition to the discussion of marketing problems, the field men are brought into contact with factory development and manufacturing plans. As the company has grown and its products have become more diversified these annual meetings have been the means of maintaining that close contact between factory and salesmen which is one of the features of Ohio Brass Service.

Charles Gordon, assistant vice-president of the McGraw-Hill Company, took part in the program by presenting a series of charts showing the application of modern industrial marketing principles to the sale of electric railway equipment.

American Bus and Truck Plans

R. D. Scott, vice-president of the Chemical National Bank, New York, has been named treasurer of the newly organized American Bus & Truck Company, which recently purchased the Kelly-Springfield Motor Truck Company, Springfield, Ohio. This announcement was made by H. W. Torney, New York engineer connected with the company, who was in Springfield with C. C. Jamieson, chairman of the company board, for an inspection of the plant. Philip Diehl, Springfield, has been named assistant treasurer. The other officers are yet to be chosen.

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The board of directors of the new company is composed of Mr. Jamieson, New York manufacturer; H. E. Freeman, president of the American Trust & Savings Bank, Springfield; Mr. Scott; Walter Kutzleb of the banking firm of Morgan, Livermore & Company, New York, and Mr. Torney.

The same sales branches of the former Kelly-Springfield company will be used by the new concern, which plans, in addition to other lines, to manufacture a complete line of buses on foreign patents.

New Cable for Detroit City Service

The Public Service Production Company, a subsidiary of the Public Service Corporation of New Jersey, is installing about 360,000 ft. of underground cable for the Detroit municipal light and street railway services. The contract was let by the Habirshaw Cable & Wire Company.

Appointments Made by International G. E.

A. S. Durant, formerly manager of the department of the Americas, has been made a vice-president of the International General Electric Company, in charge of commercial relations and with headquarters in New York City.

James C. Ryan, formerly sales manager of the department of the Far East, has been appointed general sales manager with responsibility for all sales of apparatus and supplies.

E. A. Baldwin, formerly manager of the department of Europe, has been appointed manager of the Schenectady office, with general supervision of the Schenectady office and responsibility for engineering and contract relations.

W. J. Edmonds, comptroller of the company, with headquarters in New York, in addition to his former duties, now has executive direction of the activities, with the exception of sales effort, of the International foreign sales companies.

Car Building and Motor Merger

New Company Planned to Control Brill and American Car & Foundry Motors Company—Merger Plan Expected to Be Declared Operative Soon

THE J. G. Brill Company, Philadelphia, Pa., is one of the principal figures in a combination of transportation equipment builders announced on Jan. 13 by Samuel M. Curwen, president. It involves companies having total assets of $150,000,000 and outstanding capital stock issues of nearly $75,000,000, with the American Car & Foundry Company of New Jersey the dominating factor through its acquisition of more than a majority of the voting stock of the new Brill corporation.

Mr. Curwen was active with William H. Woodin, president of the American Car & Foundry Company of New Jersey, in arranging the deal. In a letter to stockholders of the Brill company Mr. Curwen says:

> The object of the plan and reorganization, so far as the stockholders of the J. G. Brill Company are concerned therein, is to afford them opportunity to share in the advantages of a large and growing bus business conducted in conjunction with their present car business under co-operative management.
>
> Based upon appraisals of properties and audit of accounts, and if there shall be acquired by it the entire capital stock of the J. G. Brill Company, the Brill Corporation upon completion of its organization, will be possessed of assets representing a value of approximately $20,000,000, and the Brill Corporation will have a source of earnings for its stock equal to its share as a stockholder of both American Car & Foundry Motors Company and the J. G. Brill Company, in the combined earnings of the above described engine and bus companies and the J. G. Brill Company, which share in such combined earnings, based on past experience of said companies and continuance of present conditions, is estimated to amount to more than $2,150,000 per annum.

Under the name of the Brill Corporation, or some similar designation preserving the name Brill, a new corporation will be organized in Delaware to take over a majority of the outstanding stocks of the Brill company and the American Car & Foundry Motors Company, a Delaware corporation organized in December, 1925.

The latter corporation owns all the capital stock of the Hall-Scott Motor Car Company, California, and more than 90 per cent of the capital stock of the Fageol Motors Company, Ohio. The American Car & Foundry Company of New Jersey will own a majority of the voting stock of the new corporation.

More than 60 per cent of the common and preferred stocks of the Brill company have already been deposited under the plan. The plan provides that the new organization shall have 7 per cent cumulative preferred stock of about $4,000,000, par $100; 225,000 shares of no par Class A stock and 400,000 shares of Class B stock.

There are outstanding 48,102 shares of Brill common stock, a majority of which is held by Brill estates, and 45,800 shares of preferred stock. Holders of these shares can exchange them on the following basis:

Preferred stock: One and one-tenth shares of 7 per cent cumulative preferred stock of the new corporation, or $110 in cash, for each share held.

Common stock: One share of the 7 per cent cumulative preferred stock and one share of the Class B stock of the new corporation, or two shares of the Class A and one share of the Class B stock of the new corporation, or $125 in cash for each share held.

Last recorded sales of Brill common were at $136 a share and the preferred at $105.50.

Under the plan, the new company will acquire more than 50 per cent of the preferred and approximately 67 per cent of the common stock outstanding of the American Car & Foundry Motors Company, including all the stock owned or controlled by the American Car & Foundry Company of New Jersey. The latter concern, by the purchase or underwriting of such amount of the Class A shares of the new corporation as may be necessary, will provide the funds required for the purposes of the merger plan and additional working capital.

The American Car & Foundry Company will receive $1,500,000 in cash and all of the Class B shares of the new corporation not required for the purposes of exchange for stock of the Brill company. Class B shares alone have voting rights.

New Foreign Representative for American Foreign Sales Corporation

Charles R. Cullen, formerly manager for the west coast of South America for the Baldwin Locomotive Works, has joined the American Foreign Sales Corporation, 150 Broadway, New York City. Announcement of the formation of this organization appeared in the ELECTRIC RAILWAY JOURNAL for Oct. 24. Mr. Cullen will represent the company's interests in Peru, Bolivia, Chile and the Argentine, with offices in Lima, La Paz, Santiago and Buenos Aires.

In 1917 Mr. Cullen had charge of construction work in Brazil for E. J. Lavino Company, manganese shippers, later returning to this company and accepting a position with the Baldwin Locomotive Works. This resulted in his returning to South America in the latter part of 1919 to open offices for the Baldwin company in Peru and Chile.

Mr. Cullen was graduated from Cornell University, class of 1908, with the degree of mechanical engineer. After graduation, he joined the American Locomotive Company as a special apprentice, employed at both the Schenectady and Dunkirk plants until 1911, when he went with R. W. Hunt & Company, inspecting engineers, for a year. He then returned to the American Locomotive Company as a traveling engineer and commercial representative for the foreign sales department. While employed in this capacity, Mr. Cullen's field was very widespread, in Brazil, Colombia, Central America, Serbia, Bulgaria and Greece. He is a member of the American Society of Mechanical Engineers and is highly regarded in both foreign and domestic engineering circles.

Legislative Safeguards for Stability of Metal Prices Sought

Legislation will be sought during the present session of Congress to make it possible for American consumers of tin and other mineral commodities to pool their buying. It seems certain that the sub-committee of the interstate and foreign committee of the House of Representatives that will have charge of an investigation in this field will be urged to recommend such action on the part of the government.

In the case of tin, it is believed by some of the non-ferrous specialists in the government service, who expect to be called before the committee, that this step would constitute an important safeguard for the industry. Should the largest two American consumers—the United States Steel Corporation and the National Lead Company—have legal authority to join in their purchases of tin, they alone could do much

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to insure against price inflation, it is said.

While the production of Brazilian tin is under American control, Nigerian tin, under British control, is necessary to its efficaceous smelting. It will not be contended that there has been any flagrant manipulation of tin by the British, but it will doubtless be pointed out that they are in a position to bring about price advances if they should decide to do so. This is an ever-present possibility, with the success of rubber control dangling before British eyes.

$6,000,000 Proposed for Extensions in San Francisco

Mayor James Rolph of San Francisco, Cal., recommended to the new Board of Supervisors the expenditure of $6,000,000 for 25 miles of new street car lines and 8 miles of bus lines during the year. If this work is carried forward it will mean a considerable extension of present operations, for the municipal railway system as now constituted comprises 69 miles of track and 5.4 miles of bus routes.

More Business Booked by General Electric

Orders received by the General Electric Company for the year ended Dec. 31, 1925, amounted to $302,513,380. Compared with $282,107,697 for the year 1924, this was an increase of 7 per cent. For the three months ended Dec. 31, 1925, orders totaled $78,636,669, compared with $80,009,978 for the same quarter of 1924, a decrease of 2 per cent.

Tool Steel Company Is Optimistic

From the standpoint of orders received, 1925 was a record breaker for the Tool Steel Gear & Pinion Company, Cincinnati, Ohio. A considerable amount of heavy traction electrification business came to the company from abroad, practically all of these orders hailing from electrifications where the manufacturer supplied the gears in 1914-1916. Incidentally, the foreign shipments are pretty well spread about the face of the globe, as shown by the following orders:

	Equipments
New South Wales Government Railway	150
Netherlands State Railway, Utrecht, Holland	100
London, Midland & Scottish Railway	96
Havana Central Railroad Company, Havana, Cuba	32
São Paulo Tramway, Light & Power Company, São Paulo Brazil	80

In the first three cases the gears weighed from 500 to 700 lb. each.

During the year two steel gears were specified on a total of 588 new motors which were bought for the street railway lines at Altoona, Atlanta, Scranton, Gary, Denver, Rochester, and Toledo. Basing their predictions on the trend of conditions during the past few months, the Tool Steel officials are convinced that the current year holds excellent prospects for the industry.

Many Reports of Impending Car Purchases

Reports that persist in trade circles indicate that many important car purchases impend. The JOURNAL has not heard all of the reports by any means, but when in a single week rumors are on tap of the probable purchase of about 400 cars the matter deserves more attention than would be accorded to it if the purchases that are said to be impending were listed as separate items of news. Here are some of the rumors arranged on an ascending scale: Five cars for Chattanooga, ten for Nashville, ten for Evansville, 30 for Little Rock, 30 for Memphis, 75 for New Orleans, 100 for Philadelphia and 100 for Detroit. This is an imposing total, both in number of cars and in the amount of $3,600,000 estimated to be involved in their purchase.

The Chattanooga, Nashville and Evansville properties are controlled by the Hodenpyl-Hardy interests. So far as it was possible to learn, no direct appropriation has been authorized covering these expenditures. The other Southern properties reported about ready to consider the purchase of cars are all under Electric Bond & Share supervision. Confirmation of this report could not be obtained, but judging from the progress that is being made industrially and in a civic way in each of these places it would appear likely that additions to equipment would follow. A somewhat similar situation appears to exist with respect to Detroit. No cars to the extent of the impending indicated order have been purchased and no bids have been asked recently. There is an equipment purchase program under way, but H. U. Wallace, general manager of the Department of Street Railways, says the program has not been definitely decided. No order has been placed by the Philadelphia Rapid Transit Company for 100 new cars. That is definite. However, the company has before it the problem of caring for the crowds expected to attend the Sesqui-Centennial and it has already worked out its plans for track extensions into the grounds and details of similar traffic arrangements. It may be that these plans as finally concluded will embrace a program that will include among its items a provision for the addition of new rolling stock to the extent of the requirement previously indicated.

Prospects ahead in electric locomotive construction appear to be particularly good. Not only do inquiries for equipment indicate this, but it is confirmed by the electrification projects for 1926 actually outlined. One of the large manufacturing companies handling this type of equipment now has inquiries for 75 or 80 electric locomotives. This may or may not represent the total of such inquiries from all sources, but it does represent a probable expenditure of $50,000,000. If all this work materializes the total will be in striking contrast with 1925, when 47 locomotives were reported to have been ordered at a cost of about $20,000,000.

$900,000 to Be Spent in Akron

Nearly $2,500,000 will be spent during 1926 for improvements in territory served by the Northern Ohio Traction & Light Company, Akron, Ohio. The tentative 1926 budget provides for the expenditure of approximately $900,000 in the street railway and interurban department, including the purchase of twenty new buses, ten of which will be

ELECTRIC RAILWAY MATERIAL PRICES—Jan. 12, 1926

Metals—New York

Copper, electrolytic, cents per lb.	14.15
Lead, cents per lb.	9.25
Nickel, cents per lb.	35.00
Zinc, cents per lb.	8.85
Tin, Straits, cents per lb.	63.00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.875
Somerset mine run, Boston	2.075
Pittsburgh mine run, Pittsburgh	2.05
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.425
Kansas screenings, Kansas City	2.375

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.425
Angle bars, cents per lb	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.35
Sheet iron, galvanized (28 gage), cents per lb.	4.60
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.*	11.9
White lead in oil (100 lb. keg), cents per lb.	15.5
Turpentine (bbl. lots), per gal.	$1.115
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4-6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$7.00
Weatherproof wire base, cents per lb.	18.25

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.75
Light copper, cents per lb.	9.75
Heavy brass, cents per lb.	7.25
Zinc, old scrap, cents per lb.	5.125
Lead, cents per lb. (heavy)	8.00
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	18.25
Rails (short), Chicago, gross ton	18.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	9.50

*The method of selling linseed oil on a gallon basis has been changed and all sellers now quote on a pound basis.

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double-deck carriers. A new freight depot will be built in North Howard Street and cars purchased for the freight traffic. An addition will be built to the South Akron substation at a cost of $350,000.

What Is the Life of a Paving Brick?

An important investigation is being conducted by the United States Bureau of Public Roads to ascertain the durability of a vitrified paving brick wearing surface. On a circular track located at the bureau's experimental farm at Arlington, Va., ten sections of vitrified brick paving have been laid out, the only variable being found in the depth (or thickness) of the brick. This ranges from 2 in. to 4 in., being graded in increases of ½ in.

The object is to determine the intensity and weight of traffic that can be withstood by the various depths of the vitrified brick wearing surface. To this end artificial impact is being introduced and every attention given to subjecting the brick wearing surface by means of intensified traffic to the same sort of punishment and in the same or greater degree that it would get under normal use in a public street or highway. The need for this test became apparent through the increasingly greater use of thinner brick by highway engineers throughout the country. It was considered advisable to ascertain as definitely as possible through such a test just what traffic the various thicknesses of brick can be expected to withstand.

Electric Train for the Erie

A gasoline-electric train intended for the Erie Railroad is now under construction by the J. G. Brill Company, Philadelphia. It consists of a combination motor and baggage car and three day coaches. The new equipment will be placed in service around the middle of January on the Jefferson branch, near Carbondale, Pa. This will be the first gas-electric train to be commercialized in that section.

Rolling Stock

Montreal Tramways, Montreal, (Que.) Canada, has awarded a contract to the Canadian Car & Foundry Company, Ltd., for the construction of 50 new cars. The value of the contract is approximately $900,000. It is said that delivery will commence in the spring.

Tampa Electric Company, Tampa, Fla., received on Dec. 28, 1925, seven new cars which were referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 12, 1925, page 1060. The details follow:

Builder of car body	American Car Company
Type of car	Semi-convertible motor passenger
Seating capacity	52
Total weight	32,500
Bolster centers, length	23 ft. 9 in.
Length over all	45 ft. 4 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 in.
Body	Steel
Interior trim	Light mahogany
Roof	Arch
Air brakes	Westinghouse variable load
Armature bearings	Plain
Axles	A. E. R. E. A. standard
Bumpers	3-in. channel
Car signal system	Faraday high voltage
Car trimmings	Bronze
Center and side bearings	Brill
Compressors	Westinghouse DH-16
Control	K-35-KK
Couplers	None
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	Westinghouse
Exterior finish	Enamel
Fare boxes	Johnson
Fenders or wheelguards	H-B
Gears and pinions	Nuttall
Hand brakes	American Car Company
Headlights	Golden Glow SM-95
Journal bearings	Plain
Journal boxes	Brill
Lightning arresters	Westinghouse K-3
Motors	Westinghouse No. 510, inside hung
Registers	International R-10
Sanders	American Car Company
Sash fixtures	O. M. Edwards
Seats	Waylo
Seating material	Pantasote
Slack adjuster	American
Springs	Brill
Step treads	Feralun
Trolley catchers	Ideal
Trolley base	Ohio Brass
Trucks	Brill 77-E
Ventilators	Utility
Wheels	26-in. cast iron
Special devices, etc.	Nichols-Lintern traffic light

Indianapolis Street Railway, Indianapolis, Ind., overhauled and remodeled 75 cars in the company's shops during 1925. The program for the new year calls for remodeling 100 street cars so that they can be operated by one man when desired.

Track and Line

Sioux City Service Company, Sioux City, Ia., will spend about $150,000 on the construction of four major improvements during 1926. Financing for this work was made possible by the recent granting of a 25-year franchise to the company. The work planned is: A turnout will be constructed on upper Jackson Street between Thirty-fourth Street and Thirty-fifth Street. Elimination of the traffic menace at the Peters Park intersection will be accomplished by a curve and cross-over which will be constructed near the intersection of Transit Avenue and Morningside Avenue. The waiting room at this intersection will be abandoned, which will open Transit Avenue to vehicular traffic. A new line, probably double track, will be constructed on Sixth Street from Pierce Street to Jones Street, thus forming a new loop for the downtown district. New track will be laid on Eleventh Street from Court Street to Wall Street.

British Columbia Electric Railway, Vancouver, B. C., it is reported will spend $200,000 in double-tracking in 1926. Most of the money will be expended in Point Grey.

Portland Electric Power Company, Portland, Ore., in its budget for 1926 calls for an expenditure of approximately $3,200,070. In the railway department the city lines' estimate is $550,000 and the interurban lines' estimate $320,000.

Indianapolis Street Railway, Indianapolis, Ind., included in its track projects of 1925 an additional track of approximately 3,700 ft. and 4,500 ft. of track in East Tenth Street. In Central Avenue 4,030 ft. of single track was replaced and in Pennsylvania Street, 4,000 ft. of single track was replaced and an additional 1,000 ft. laid to provide double-track facilities. Renewals were made at practically every one of the downtown intersections. The company used 1,500 tons of steel, 38,000 ties, 670,000 paving bricks and 60,000 paving stones. In connection with this work, 5,600 rail joints were welded by the thermit process.

Trade Notes

E. C. Folsom has been appointed receiver for the Railway Materials Company, Toledo, Ohio, by an order of the United States District Court at Toledo. Notice has been mailed to creditors of the company requesting them to file claims promptly in order that the assets may be quickly and economically liquidated.

J. G. Brill Company, Philadelphia, Pa., announces the appointment of F. O. Paul as service manager of its automotive car division. For several years Mr. Paul was connected with the sales and service departments of the Timken Roller Bearing Company, Canton, Ohio. He was previously affiliated with the International Motor Company as chief inspector at its New Brunswick, N. J., plant. His experience in automotive affairs covers a period of more than fifteen years.

Morton Manufacturing Company, Chicago, Ill., has purchased property adjacent to its present Chicago plant, on which it is planning the construction of an addition which will provide 50,000 sq.ft. of extra shop space.

L. S. Belding has joined the Electric Service Supplies Company, Philadelphia. He is a graduate of Pratt Institute, Department of Science and Technology, later attending the H. L. Doherty School at Toledo. After leaving the army Mr. Belding was connected with the Albany Felt Company as factory engineer, and as factory and service engineer for the Consolidated Car Heating Company. Later he acted as sales engineer for the latter company. Mr. Belding will cover Ohio and part of Michigan for Electric Service Supplies Company.

New Advertising Literature

General Electric Company, Schenectady, N. Y., has issued Bulletin GEA-295, entitled "Automatic Switching Equipment." It is well illustrated and describes the application of this equipment to railway service, hydro-electric generators, mining and industrial service, central station service, etc.

Topping Brothers, New York, distributors for Bearium Bearings, Inc., Buffalo, N. Y., have issued a leaflet setting forth the outstanding advantages of these bearing metals for all types of industrial requirements. Five grades of metal are specified, each adapted for certain types of work. Among the merits claimed for Bearium products are the overcoming of porosity, ease of machining, non-scoring of shafts or journals under faulty lubrication conditions, longer service and greater strength.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Comprehensive Program for Co-ordination by New Haven

ELECTRIC railway, steam and bus operation are all to be tied in together by the New Haven Railroad with tickets good for interchangeable traffic. It is no mean program, this upon which the road has entered, but there is no desire here to do more than to indicate its extent. Certainly in Connecticut the passenger will be able to go almost anywhere on this combined system. This is true to a lesser degree in Rhode Island and Massachusetts, but it is true, nevertheless. In Massachusetts especially has a division of territory been arranged. With the past there is very little concern. But history does repeat itself. The New Haven opposed the trolley at its inception, only later to take it over and turn it to its own advantage. The New Haven opposed the bus at its inception, only now to take over many lines that fit into its revised scheme of things.

It is, of course, unfortunate in some ways that the New Haven did not earlier see the bus in its proper light. But why dwell upon that? We do not live in the past, except those of us who have nothing else left in which to live. Despite the old adage, opportunity often knocks at the door many times. This is what it did in the New Haven case. Even now Mr. Buckland, who announced the road's new policy, appears to be overcautious. He says branch line service costs the road $1.25 a mile, while the revenues are only 35 cents a mile. He does not look to the bus to increase the gross revenue, but he does expect greater net because the bus will cut expenses. Students of the bus who have followed it closely would be inclined to say that Mr. Buckland will probably be surprised. It certainly seems likely that he will be.

One thing is certain. The type of branch line to which Mr. Buckland has referred was doomed years ago. It had come to be an anachronism, with its stodgy, ill-painted, ill-ventilated cars of the vintage of 1875. The contrast between those vehicles and the modern bus was too great—too great for the branch line in communities that have grown, have model houses in their outlying and country districts, radios and electric lights and in which the Saturday night bath in the family washtub went out of fashion a quarter of a century ago.

This is, perhaps, homely phrasing, but it does not exaggerate the contrast between the two—modern bus and the branch line steam car. The steam railroad itself did this very thing. In the case of the New Haven it carried the passenger from New York or Boston to Bridgeport, Hartford, Willimantic or Putnam in regal style and then dumped out the one who had to go into the interior and expected him to complete his trip in a troop train. Naturally, the passenger rebelled. He wasn't interested in the rights or wrongs of the situation. He seldom is. His concern is in reaching his destination in the quickest possible way and in the most commodious fashion. There was a time when he wasn't a free agent, but the development of the automobile emancipated him. After all, the possibilities of co-ordination are great—much greater than Mr. Buckland's statement would seem to indicate. The only fault to be found with him is that he errs too much on the side of conservatism. Still his announcement is definite and conclusive. No other similar statement made in many months is more significant than is that of the New Haven Railroad.

Pinchot Again Assumes the Rôle of Umpire

HOW it can be expected that a public service commissioner can reconcile his oath of office to decide honestly upon the intricate matters coming before him with the Governor's wishes in the matter if they should not be in accord is not well understood. The courts have often held that such regulatory bodies function for the legislative and not the administrative branches of our government, and administrative interference if not successfully resisted can only produce chaos.

Elsewhere in this issue is a story outlining the final decree of the Pennsylvania commission on the Philadelphia Rapid Transit fare case, just concluded, which has been on the docket for a year and a half.

Not satisfied with the rebuff he received from the Supreme Court when it overruled his dismissal of Commissioners Benn and Shelby, Mr. Pinchot again appears to have vented his personal feelings by withdrawing the reappointment of John L. Stewart, one of the seven present commissioners. The nomination for reappointment had been made but a few days before. Mr. Stewart voted in favor of the order granting the 8-cent fare, and the nomination was withdrawn immediately. Such seems to be the price Mr. Stewart paid for performing his duty under oath.

Without reference to the justice or reasonableness of the commission's decision, there is no evidence apparent that this body or any of its members is guilty of misfeasance or malfeasance of office. If there should develop such evidence the law prescribes more appropriate ways to punish the members than by dismissal by the chief administrator. Even if the Governor had evidence that the P.R.T. should not have received the increase, the hearings covered a period of a year and a half and the place to present such evidence was from the floor of the hearing room.

The very creation of public utility regulation was to render honest decisions based on facts. An attempt to sway judicial opinion by threat or coercion strikes at the very heart of such regulation, if not of law and order as a whole. Such policies supposedly passed with feudalism. They were the cause of overthrowing despotic Russia. To be sure it is a far cry from Pinchot to Romanoff, but tendencies to revert to such times are disturbing, nevertheless.

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Progress Being Made in Control of Interstate Buses

IMMEDIATELY following the decisions by the United States Supreme Court in the case of Buck vs. Kuykendall (45 Sup. Ct., 324) and in that of George W. Bush & Sons Co. vs. Maloy et al. (45 Sup. Ct., 326, 327), it was quite generally assumed by many people that individual states, acting through their public utility commissions, could not exercise any jurisdiction over interstate bus lines or at least those which did not do any intrastate business.

Actually this conclusion was far from being warranted by the decisions mentioned. The Supreme Court, in the Buck case, distinctly said that state regulations adapted primarily to promote safety upon the highways and conservation in their use, where the indirect burden imposed on interstate commerce is not unreasonable, are valid under the federal Constitution. In both of these cases, however, questions of this kind were not involved. Both Buck and Bush were willing to comply with all the laws governing common carriers in the states concerned, Washington and Maryland. The trouble arose over the fact that the state commission in each case declined to permit operation without a certificate of convenience and necessity, which it refused to grant because the routes in question were being served by existing carriers. It was prohibition of operation for this reason that was stated to be within the power of Congress and not that of the individual states.

As yet, Congress has made no attempt to exercise the control which is beyond that possessed by the individual states. While Congress has empowered the Interstate Commerce Commission to supervise with great strictness the operation of interstate rail lines, it has neglected to authorize this commission or any other to exercise similar control over the interstate bus lines. Such a control over rates, routes and schedules is necessary in the interests of the public, as well as of the carriers themselves, and this is the reason that a bill is now pending in Congress to bring about such a control.

Existing Powers of States Being More Closely Defined

WHILE this discussion over a federal bill is taking place before Congress, the existing powers of states over interstate carriers are being more closely defined by the courts. These are the powers to which the Supreme Court referred in its Buck and Bush decisions already mentioned. It has been held by the Rhode Island Supreme Court, for instance, that the Public Service Commission of that state may apply regulations enforced upon similar intrastate users in regard to the number of passengers which such an interstate bus may carry at any time, or the routes it may take, as these regulations are in the interest of public safety and order and the conservation of the highways. The Massachusetts Supreme Court, in decisions rendered Jan. 5, 1926, has held that the fact that a bus line did some interstate business did not affect the extent of the regulation which the state could exercise over all of its intrastate business, and the argument that these regulations on its intrastate business might affect its profits as an interstate carrier did not make the regulations invalid.

Another particularly illuminating recent decision is one rendered by the Supreme Court of Ohio on Dec. 1, 1925, in the case of the Cannon Ball Transportation Company vs. Public Utilities Commission of Ohio (149 N. E. Rep., 713).

After reviewing the Buck and Bush decisions, Chief Justice Marshall of the Ohio Supreme Court points out that although the mode of transportation by motor bus is very recent, the question of the division of control by nation and state over interstate carriers is older than even the steam railroads and was thoroughly reviewed by the United States Supreme Court by Mr. Justice Hughes in the Minnesota rate cases. Thus, the state may not be able to tax interstate commerce, prescribe rates to be charged for it, or subject it to requirements beyond the bounds of suitable local protection. But it may require the right of pilotage in the case of interstate water carriers, regulate wharfage charges, exact tolls for the use of artificial facilities provided under its authority, take steps to prevent the introduction or spread of disease by interstate carriers, safeguard the inhabitants of the state from fraud and imposition, provide damages for wrongs or death by such carriers when the wrong occurs within the jurisdiction of the state, enact laws safeguarding property and life, and do many other similar acts, unless they are in conflict with valid laws of Congress.

It is obvious that the principles of commission regulation, which have proved so necessary for rail transportation lines, should be equally necessary for interstate bus lines. That these will come there is no doubt. That it is also closely in line with the approved policies of the past is also clear from what has just been said.

Competition with the Private Automobile Is Real Problem

CITY railways in the larger metropolitan districts seem to have attained some degree of success in competing with the privately owned automobile. In fact, the latter vehicle might be said to have been its own worst enemy, since its extensive use has caused congestion to the point of traffic stagnation. This condition is by no means so apparent in the smaller communities, however, and it behooves railway officials there to remain figuratively "on their toes" in meeting the problem more than half way. Private cars in use at the present time are estimated at 17,500,000, an increase of a little more than 13 per cent over the figure of a year ago. Much of this increase has taken place in the smaller cities and among farmers and suburbanites, so that the problem has become, if anything, more difficult than ever to meet satisfactorily in communities with less concentrated populations.

Authorities in many of these smaller towns are still meeting any indication of forthcoming traffic congestion by proceeding rapidly to the construction of new streets. In fact, there is probably more truth than fiction in the recent remark of an electric railway president that the only apparent excuse for some new streets was to provide additional free parking space for the convenience of automobile owners. Even though this may be somewhat of an exaggeration, it is certainly true that the conditions which have caused many individuals to give up in disgust any idea of driving through the business sections of the larger cities are still in a rudimentary stage of development in the town of 100,000 or less.

Even in communities of small or moderate size, however, there still is need for adequate public transportation. The railways must take care of the man who

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cannot or will not drive his own car to work, of the woman who wishes to do her shopping "downtown," and of the child whose school is beyond comfortable walking distance.

Many economic prophets believe that the present state of national prosperity cannot continue indefinitely at its present unbelievably high level. They say that the economic house of the American people is builded upon the sands, to a certain extent, and that a depression must inevitably follow. This may mean that in the general paring down of luxuries, the abandonment of many private automobiles will naturally follow a downward swing of the pendulum. Then perhaps the railway in the small town will come into its own once more.

But operators cannot afford to sit back in their chairs and wait for the inscrutable workings of Fate to win their battles for them. Much can be done, and is being done, today, through the adoption of light-weight one-man cars and buses, as well as modernization of existing equipment, to speed up service, increase its frequency and make the railways' transportation attractive to the riding public. When this is done Mr. Man or his wife may think twice before taking the family automobile out on a cold and slippery morning in January, or a muddy and equally unpleasant day in August. Sell them thoroughly on the idea of service on the days when they are riding the trolley to save the paint on the family "bus," and much will have been done to encourage their use of the public carriers on the pleasant days as well.

Baltimore Needs to Heed Its Traffic Experts

WITHIN reason Baltimore should heed the advice of the experts who have reported the results of their traffic survey of that city. In one particular especially is there need on the part of the city's civic and commercial interests to play the game and cooperate with the railway and the commission to the fullest extent. This is in the matter of rerouting street cars. Here is where toleration is needed. It is not an easy matter to readjust lines, reroute them and shift traffic arteries. Somebody is going to be hurt. That is inevitable. The damage is going to be temporary, however, and probably in no case will it be very serious. In all such cases the individual here and there is going to conjure up in his own mind calamities that will never occur. Even at this early date there are unmistakable signs of opposition to some of the suggestions. There is just one thing about it. Those responsible for the plans have approached the problem cautiously. Their only desire is to be of the greatest good to the greatest number.

In all matters of this kind the progress that is made depends on the willingness of those affected to put aside petty personal considerations and to work for the benefit of all. Baltimore will benefit only in so far as these purely personal considerations are put aside. In the last analysis anything that is decided along broad, general lines as being best for Baltimore as a whole will be best for Baltimoreans individually in the long run. This should be self-evident. Some good will have been accomplished even though none of the suggestions come to fruition at this time, but it is unbelievable that Baltimore will write itself down as being unwilling to accept the suggestions made.

Giving Young Men a Chance Builds Up Company Morale

BESIDE the question of whether the college man fits into the field of local transportation is the problem of developing a young man's administrative ability. It is a question of the type of man as well as of training, for some men will never be more than dull, weary plodders, regardless of how much information they may have absorbed. Others become so engrossed in the technical details of their particular work that they care little about aspiring to positions requiring administrative ability. But there is always a sufficient supply of men of ambition who need merely the opportunity to develop into first-class operators and department heads.

The old school of street railway transportation was founded before the day of scientific regulation and required a lot of politics. The new school demands more open relations and a greater understanding of the needs of the public. There are very few phases of the street railway industry that are not influenced to some extent by the rising need for closer public relationship. There was a time when we let our lawyers do everything that was needed in that line; as a result the heads of corporations were usually lawyers.

The demand of today is for a spread of the idea of closer public relationship to all phases of the industry from the president down to the platform men. For the work of spreading the idea of public service there are seldom enough old heads to go around. So we must turn to our youth, remembering that the young leaders of today are the old leaders of tomorrow. Frequently the college man is easier to adapt to the making of public contact because of his developed resourcefulness and greater fund of knowledge. But other men of fair education and more than the usual amount of initiative will often suit as well.

As a particular example of how this works out in practice there is a large public utility management corporation which makes a practice of training young men (in this case mostly college men) in its ranks with the idea of developing its own executives. Besides developing its own executives it has developed a number of men who are executives of other large companies. Its properties are managed by comparatively young men. There is exceptionally good co-operation among the various departments, and there are probably few railways as much in the public eye as these because of their startling advances in the industry, and because of their willingness to accept suggestions and to share their knowledge with others. These companies have prospered financially and their public relations are exceptionally good in spite of the fact that many of these companies are obliged to operate under local regulation which is usually unsatisfactory. Results have been brought about not by favorable legislation, but rather by capable and aggressive management.

Give the young man a chance. College man or not, if a young man shows administrative ability he should have the opportunity to develop it early by receiving a little authority. Mere years are not experience. One man with the right opportunity may acquire as much experience in two years as another will in ten. It is well to curb a spirit of ill-founded egotism in a man, but it is another matter to expect him to perform dull drudgery for ten or fifteen years and crush whatever spirit is in him and then to expect him to rise to the occasion when there is need of a minor executive and one is being sought from within the ranks.

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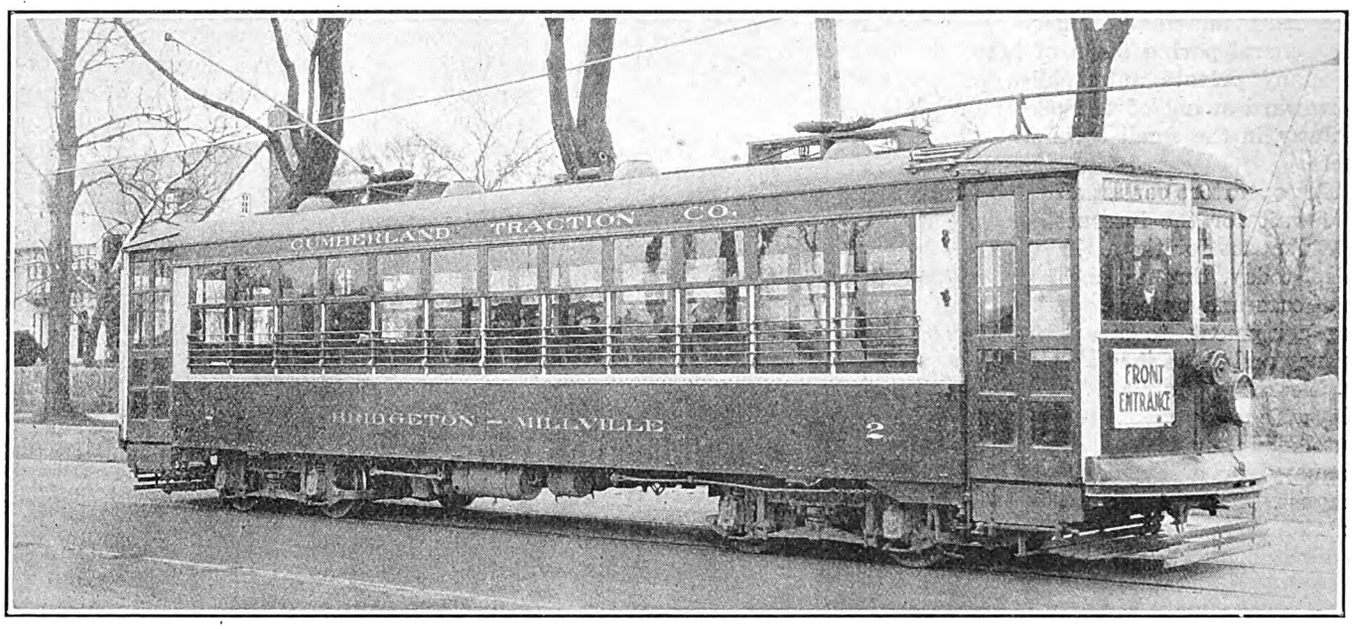
New Methods Save a Small-Town Railway

Purchase of Modern Rolling Stock, Improvement in Schedules and Skillful Publicity Resulted Last Year in a 10 per Cent Increase in Riding on the Lines of the Cumberland Traction Company — Operating Expenses Have Been Reduced from 28 Cents per Car-Mile to 21 Cents



Traffic Has Been Substantially Increased by the Operation of Cars of This Type Between Bridgeton and Millville in Southern New Jersey

RESCUED at the last moment from the hands of the junk dealer when operation ceased in the summer of 1922, the electric railway connecting the towns of Bridgeton and Millville in southern New Jersey has been built up during the past three years into a profitable business. This was done by making substantial improvements in the quality of service, by providing better cars and better headways, and by the use of aggressive publicity methods which have kept the railway constantly in the public eye.

Prior to June, 1922, this property, comprising about 40 miles of single track, was owned by the American Railways Company. Under the name of the Bridgeton & Millville Traction Company it operated interurban service between these two towns and local service in the former municipality.

Following a prolonged period of unprofitable operation a request was made to the State Board of Public Utility Commissioners for permission to abandon the entire railway system and sell it for junk. As it did not appear likely that the lines could ever be made to pay their way, this permission was granted. The company ceased operation on June 15, 1922, and began to tear up the rails.

At this time, however, Clayton W. McPherson, a business man of Bridgeton, conceived the idea that the railway could be rehabilitated and made profitable. Against the advice of all his friends he bought it. Since the old company had planned to dismantle the property the price paid was small. Operation of the Bridgeton-Millville line was resumed with the old cars after a suspension of service lasting only three days. Local service, however, was not resumed until some months later.

Public sentiment demanded that there should be no cessation of the interurban operation to Millville. Although the distance between these towns is only approximately 10 miles and a state highway connects them, the public did not feel that bus service would be an adequate substitute for electric railway service. For this reason Mr. McPherson arranged to resume car operation immediately after his purchase.

Concerning the necessity for operation of local electric railway service in Bridgeton the public was not so thoroughly convinced. At the time when service was suspended, there was a somewhat general feeling that independent buses could handle this situation better than street cars. No attempt, therefore, was made then by the new owner to establish any local service. During the course of several months, however, the

RECAPITULATION OF OPERATING EXPENSES, CUMBERLAND TRACTION COMPANY AND ITS PREDECESSOR, CENTS PER CAR-MILE

	1916	1917	1918	1919	1920	1921	1922	1923†	1924	1925*
Way and structures	3.50	2.52	3.95	4.75	6.11	4.84	4.92	2.14	2.87	2.70
Equipment	2.37	2.90	3.40	4.54	6.27	6.52	5.24	3.04	3.24	3.20
Power	3.43	4.86	5.68	5.96	6.37	6.36	5.84	4.95	4.83	4.60
Conducting transportation	4.90	5.64	7.22	8.29	8.74	8.75	8.53	7.12	7.03	7.00
Traffic	0.41	0.34	0.21	0.24	0.10	0.05	0.00	0.01	0.01	0.01
General and miscellaneous	2.80	2.41	2.71	3.47	3.37	3.35	3.47	5.60	3.97	3.50
Total operating expenses	17.41	18.67	23.17	27.25	30.96	29.87	28.00	22.86	21.95	21.10

† Operation of new cars commenced in January, 1923. * Estimated.

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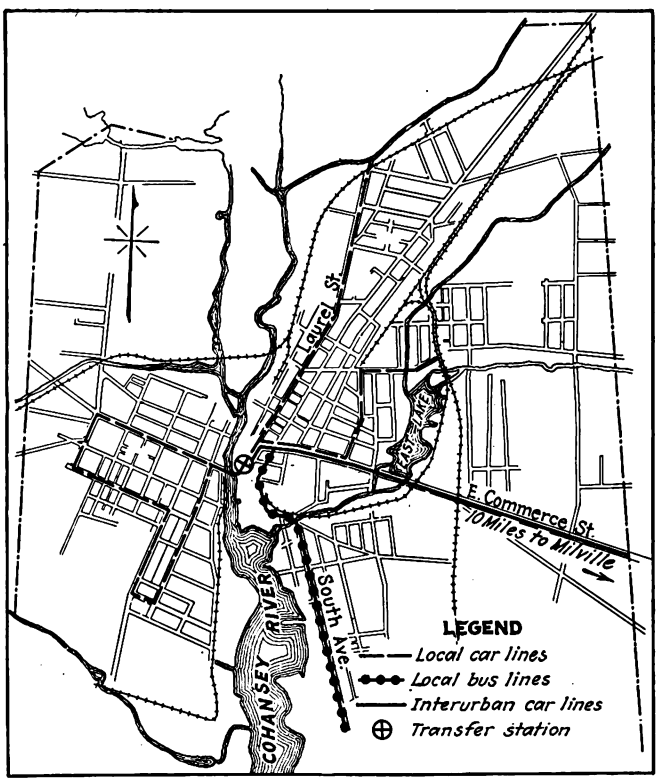
people of the town became disgusted with the character of the bus service provided by the independents and a large mass meeting was held to consider the problem of local transportation. The meeting was practically unanimous in favor of the restoration of railway service. Only three dissenting votes were cast and these came from three independent bus operators who attended the meeting.

As a result of this meeting and the sentiment expressed, Mr. McPherson agreed to undertake local service. To enable the railway to operate without loss the city agreed to release the company from paving charges. On its side the company agreed that if it should fail to make a success of the local service it would remove the rails, but would make no attempt to remove other material in a manner which might disturb the paving.

Rolling stock and track were found by the new owner to be in run-down condition. The track was not so bad, however, but that it was possible to put it in fair operating shape at a moderate cost. It was decided to scrap the old cars altogether and buy new ones. Three light-weight, double-truck, one-man cars were ordered from the J. G. Brill Company. Four Birney cars were also ordered. The double-truck cars were placed in service in January, 1923, on the Bridgeton-Millville line, and in the latter part of May the Birney cars began local operation in Bridgeton.

At present the system consists of two local lines operating three cars in Bridgeton and one local bus line. These all meet at a transfer station in the center of the town, which is also the terminus of an interurban car line to Millville. The present bus route is part of a former car line to Bivalve, 20 miles away. As the new management believed that only a short section of this line was in territory that would support transportation service, bus operation was undertaken within the city and all service suspended outside. Altogether some 15.8 miles of road are now operated. In Millville local service is provided by the Millville Traction Company.

Patronage on all of the car lines has been good ever since service was resumed in 1923. The total passengers carried for that year numbered 608,551, or



Two Local Car Lines and One Bus Line Are Operated by the Cumberland Traction Company in Bridgeton. An Interurban Car Line Connects that Town and Millville

slightly less than the number carried in 1922. This was because local service was not resumed until the middle of the summer. For the year 1924 the number of passengers carried was 895,922. This figure was exceeded during the year just ended by some 87,000, making the total number of passengers 983,000. Last year thus shows an increase of about 10 per cent over 1924, which was the first full year of operation under the present plan.

For the last three months of the year the rate of increase is even greater, being about 16 per cent. It

Nine Catchy Posters Executed in Bright and Attractive Colors. They Have Been Useful in Bringing the Railway to the Attention of the Public

Several Distinct Types of Publicity Matter Are Used—Safety Slogans, Advertisements of Fraternal Organization Activities, Railway Messages, Etc.

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Prospective Passengers Need Not Stand While Waiting for Cars of the Cumberland Traction Company

is expected by the management that 1926 will show still more favorable results. Financial conditions are more satisfactory than ever before on account of the increased traffic, the relief from paving obligations and the decreased operating expenses with the new cars.

Total operating expenses have decreased from 28 cents per car-mile in 1922, the last year when the old cars were running, to about 21 cents in 1925. The year immediately following the inauguration of service with the new cars, the cost dropped to 22.86 cents per car-mile, and this was further reduced in the succeeding two years. Equipment costs have been reduced from 5.24 cents per car-mile to 3.20 cents; power from 4.95 cents to 4.60 cents; way and structures from 4.92 cents to 2.70 cents.

Various methods have been adopted to promote good public relations. More attractive cars operated on more regular headways have been of primary importance in this respect. For the convenience of prospective passengers who arrive at the car stop before the time of arrival of the car, the railway has provided benches. These carry the message that "it will soon be car time."

When the company built a new concrete carhouse to accommodate its passenger cars, the service cars were placed on a storage track outside the building. It so happened that the carhouse was located directly across a canal from a pleasure park. Users of the park thought that the presence of the work cars on the storage track was a discordant note in the sylvan surroundings. The company, therefore, built an arbor between the tracks and the canal and planted roses which now have grown up high enough to conceal entirely the outside tracks and the cars in storage.

Another instance of the methods used to improve public relations is the privilege which the company grants on hot summer nights of riding all evening for a single fare. Many people spend the evening riding this way to keep cool and those who avail themselves of the privilege remain friends of the company.

PASSENGERS CARRIED DURING LAST QUARTER OF 1925

	1924	1925	Increase
Local passengers—October	44,229	55,530	11,301
November	43,892	52,595	8,703
December	53,814	61,375	7,561
Average monthly increase			9,188
Interurban passengers—October	27,121	29,860	2,739
November	26,591	29,942	3,351
December	29,138	30,949	1,811
Average monthly increase			2,633
Average monthly increase all lines			11,821

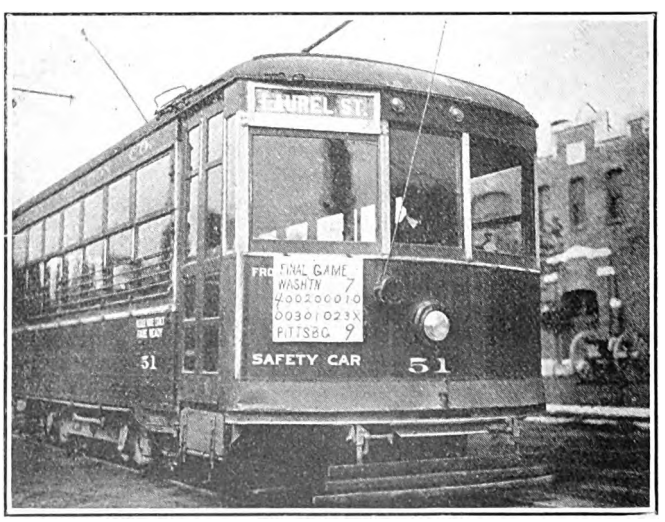
An aggressive publicity policy has marked the management of the reorganized company. Every week Mr. McPherson has had a message to tell the public. This has been done by means of posters carried on the front dashers of the cars. The posters are home-made and look it, but this is thought to add to rather than detract from their effectiveness.

The process of making these posters is a simple one. The design is first drawn on a sheet of paper of the same size as the finished poster. Using a manual training knife with a blade about 3 in. long the designer then cuts out the pattern in stencil form. The stencil sheet is next set up on an easel in front of the paper to be used in the poster. Colors are spread on by means of an air brush attached to a tank under one of the cars. Colors are used for all of the posters. Ordinarily these are artist's water colors, but oil paints are sometimes thinned out and used for special purposes.

Subject matter of the posters varies widely, as will be seen from the accompanying illustrations. Many of the posters are intended to convey some message which the railway wishes to impress upon the public. On the other hand, many have no connection with the railway. Some are safety slogans, while others simply call attention to coming events, meetings, activities of fraternal organizations, etc. Comparatively few of the illustrations are original but are copied in whole or in part from ELECTRIC RAILWAY JOURNAL, *Aera*, and other publications.

An unusual feature of the publicity work was posting of the World's Series baseball scores by innings on the front of the cars during that week. Scoreboard posters were made up in advance and placed on cars. Returns were received by radio in the center of the city. The railway had a man with a paint brush ready and when a car passed he would post the score.

Artistic Dash Poster Welcoming Members of American Legion When Their Convention Was Held in Bridgeton



Scores of the World's Series Baseball Games Were Received by Radio and Posted Inning by Inning on the Front Dashers of the Cars

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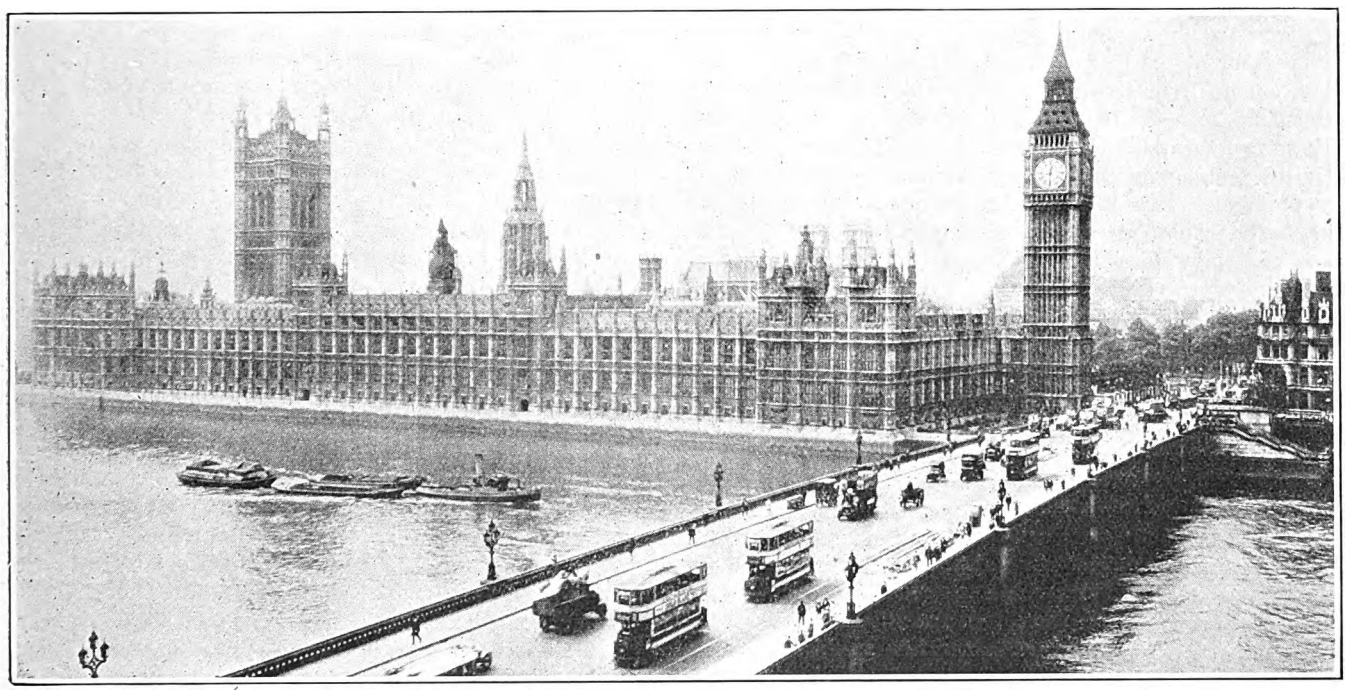
Casual Observations on the Operation of European Tramway Systems

Heavy Platform Loads Create Problem in Body Design — Present Practice Favors a Longer Wheelbase than Formerly Used — Many Cars Are Excessively Heavy—One-Man Operation Has Not Been Widely Accepted

By Spectator



Double-Deck Tram Cars Are Widely Used in England as Indicated by This View of Westminster Bridge, London

WHEN one has commenced his career in the street railway industry and has made it his life work it is difficult to abandon all interest in this subject when one goes away for a vacation. On a recent journey in England and on the Continent I saw many tramway systems, both modern and out of date, with clean cars and dirty cars, and numerous surprising differences between the practices in some countries and in others. As I did not make a trip of technical investigation, such as the editor of ELECTRIC RAILWAY JOURNAL took in September, 1924, I shall confine myself to indicating several peculiarities that especially struck me.

What most surprises a stranger in England is the widespread use of double-deck cars. One wonders why this type of car is not generally used on the Continent. With approximately the same dead weight and motive power this type of vehicle could transport 25 to 30 per cent more riders than a car without the upper deck, and the platform cost would remain about the same. I say "could transport" 25 to 30 per cent more because in England passengers are not allowed on the platforms, while all over the Continent it is the platform that carries the majority of the passengers. For that reason the English double-deck cars actually carry fewer riders than the single-deck cars on the Continent, although they could easily accommodate a greater number. On the Continent from 24 to 40 passengers are allowed on the platform, while inside the car in double the space there are only some 20 to 24 passengers. Thus it is the platform that earns the dividend.

These conditions regarding the distribution of passengers on the cars have a curious and interesting reaction on the construction of the car body. In England all the load is concentrated in 10 to 13 ft. in the middle of the car, while on the Continent the load is distributed from end to end.

Frequently it appears that little or no account of this distribution of weight has been taken. In many places where the platforms are heavily loaded, it may be noted that the bodies are bowed at the two ends. Perhaps that is one reason why the rigid single truck, so well thought of in America, has been able to find users in only a few countries on the Continent. The English car is supported on a rigid single truck with a base of support of about 10 ft., but on the Continent this support must be much longer. Preferably it should be extended under the platforms, as has actually been done on many cars, especially in Denmark and Germany. In France single trucks are used on a number of systems. A large number of cars, however, have a very pronounced teetering and nosing movement, to

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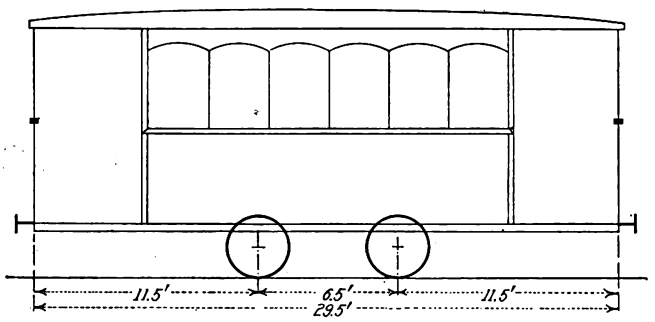
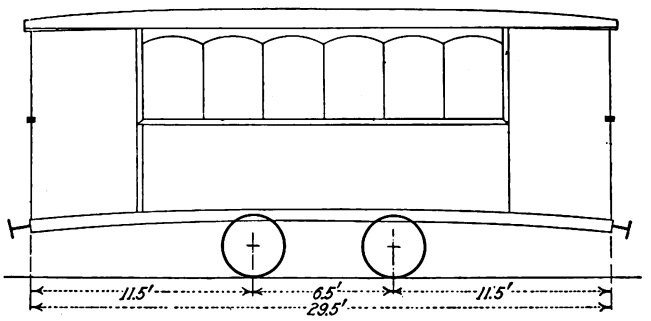


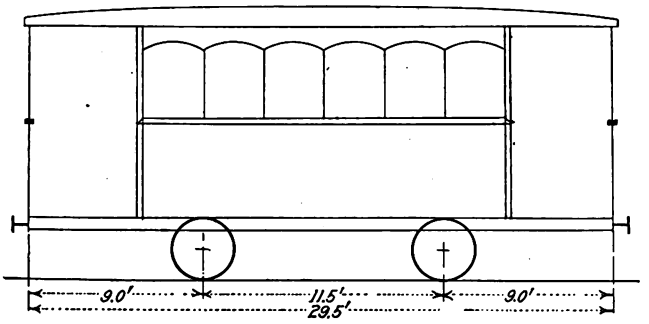
On the English Car, Accommodating 30 Passengers Inside and None on Platforms, the Weight Is Concentrated in the Center Section. Usually This Car Would Carry a Double Deck



The Continental Car, with Twenty Passengers Inside and Twenty to Twenty-five on the Platforms, Sags at the Ends Unless Very Solidly Built

say nothing of those that sag at both ends. Various types of truck are shown in the accompanying illustrations.

Everywhere in Europe the short wheel base is being abandoned little by little. Cars in England have a wheelbase of 8 to 10 ft. This is made possible by the use of an oscillating stirrup. From the arms of the stirrup resting on top of the journal box is suspended by means of two hinges a short piece which carries the two springs on which the body rests. The axles thus can move laterally while remaining parallel. The body plays freely in the yoke in a lateral direction only.

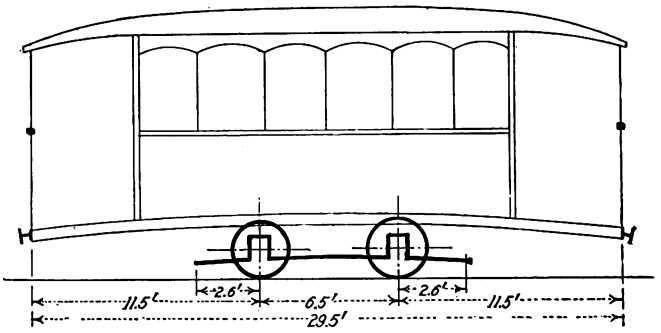


Type of Car with 11.5-Ft. Wheelbase Used in Europe

It appears that the freedom of lateral displacement of the axles facilitates the passing of curves to such an extent that wear and tear on the tires and the gage side of the rails is considerably reduced. So far as I know there are only one or two applications of this system on the Continent.

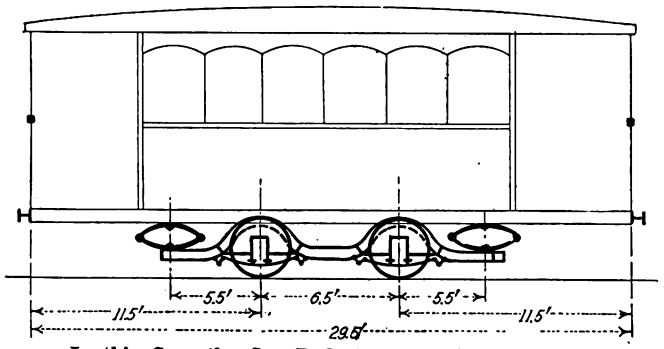
Long wheelbases are met with in Switzerland, but they usually are attained by the use of slightly radial axles. Although this is complicated and expensive with regard to maintenance, the heavy loads on the platforms make it imperative that the overhang be reduced to a minimum, and any system that permits the lengthening of the wheelbase is likely to be resorted to. Lateral displacement of the axles to permit the easy passage of short radius curves has been adopted by the management of the Paris tramways for its type L (light) cars. The wheelbase of these cars is about 12 ft.

At Barcelona I saw striking examples of the discomfort of a car with large platforms and a short wheelbase. These cars, which seemed to me to be very heavy, are more than 9 m. in length and are mounted on rigid trucks of about 2 m. wheelbase. The platforms are overloaded all day long with from 20 to 30 passengers and the cars have a pronounced teetering movement. The weight on the overhang must be at least 11,000 lb. Destruction of the roadbed is rapid and the sum which has to be put aside annually for its upkeep must absorb a large portion of the receipts.

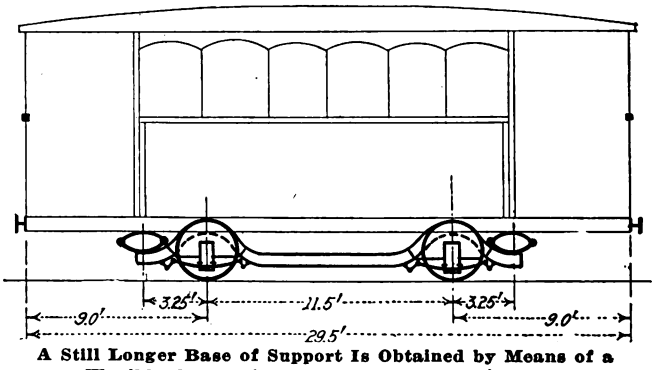


Same Car on a Truck with Short Base of Support

In several cities I saw applications of the radial truck with two axles, but only on a few cars. One would say that here and there a timid trial has been made which was not followed up. The attractive theory of such construction is well known, but in practice it sometimes is quite another thing. Experiments along this line have been made at Ostend in Belgium, at Liége and at Dortmund. A car 30 to 33 ft. in length, mounted on three axles, is used at Ghent. Technical information on the subject of this car unfortunately was not obtainable. Maintenance of three pairs of tires and the wear on the rails by three sets of wheels must surely be more expensive than the swinging system



In this Case the Car Body Rests on Springs at the End of the Truck Frame



A Still Longer Base of Support Is Obtained by Means of a Flexible Suspension and Lengthened Wheelbase

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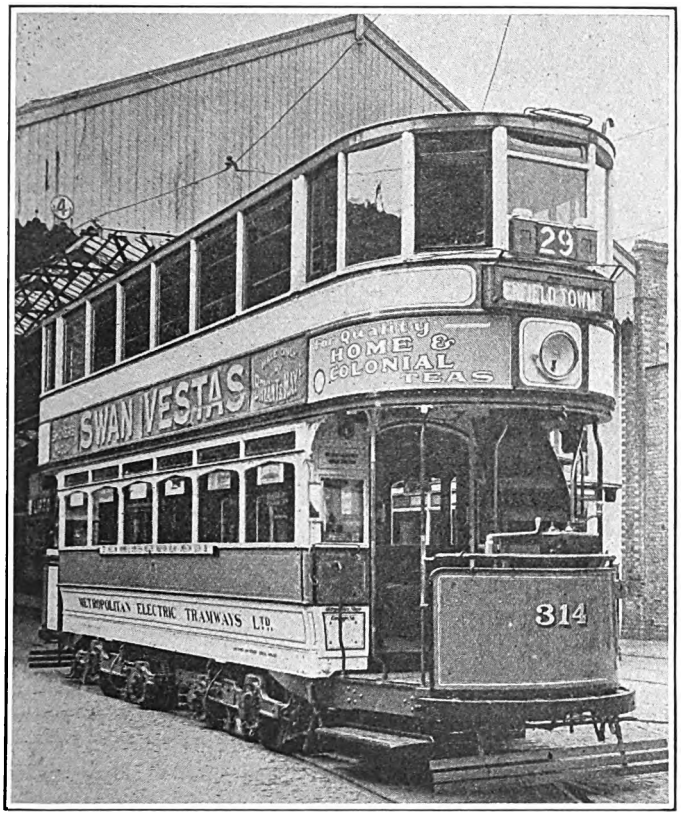


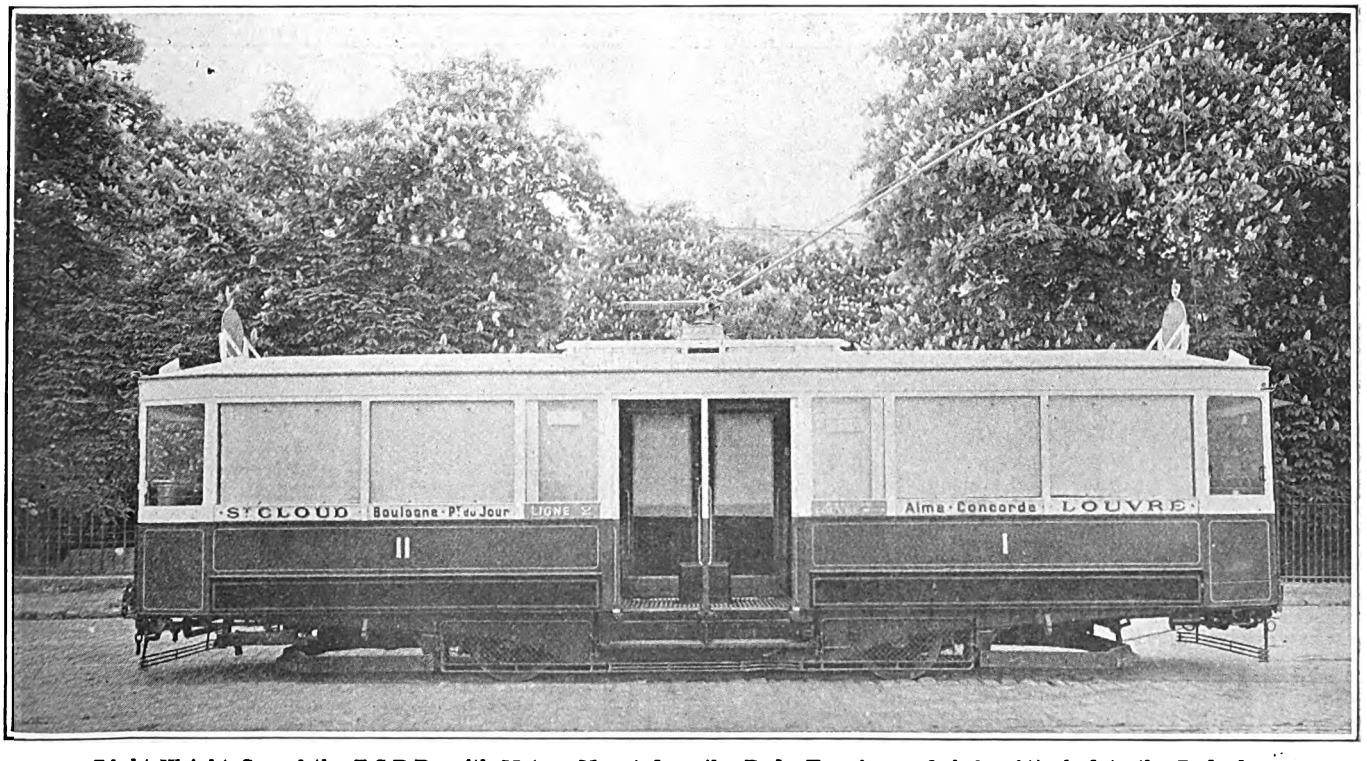
Double-Deck Double-Truck Car of the Metropolitan Electric Tramways Is Typical of Many English Cars

Another Type of Car Used in England. A Removable Top Protects the Upper Deck in Winter

used in England. It would be interesting to know the reasons that influenced the management at Ghent to resort to a system of suspension from three axles.

Efforts toward the use of a long wheelbase have been carried much farther in Europe than in America, a fact which may be explained by the difference in loading on the cars.

Excessive weight of the cars is an odd feature on most of the European systems. Particularly is this true in Holland. Perhaps that is due to the character of the people, who prefer that which is solid and durable and who seek for good quality rather than cheapness. The equipment is excellent, perhaps too good, as the weight exceeds bounds of economy. The cars of Leyden, carrying 63 persons, weigh 35 tons or 1,100 lb. per passenger. Nothing makes it necessary



Light-Weight Car of the T.C.R.P., with Motors Mounted on the Body Framing and Axles Attached to the Body by Springs and Shackles. This Arrangement Gives About 15-In. Play for the Axles

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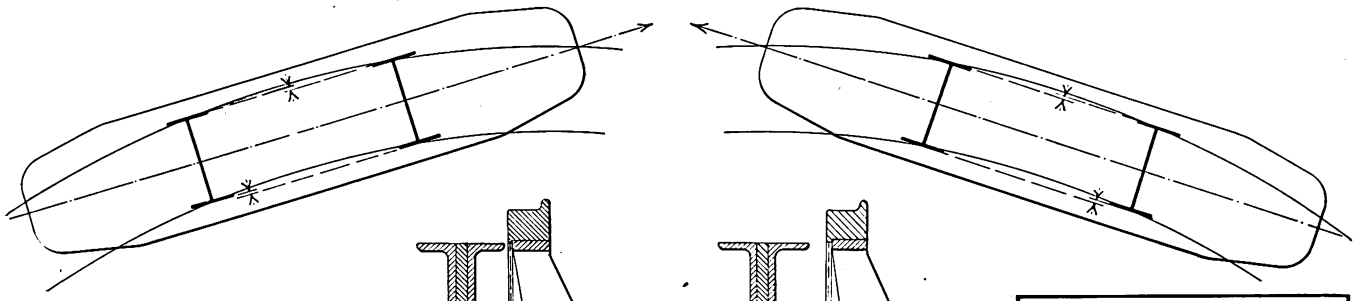
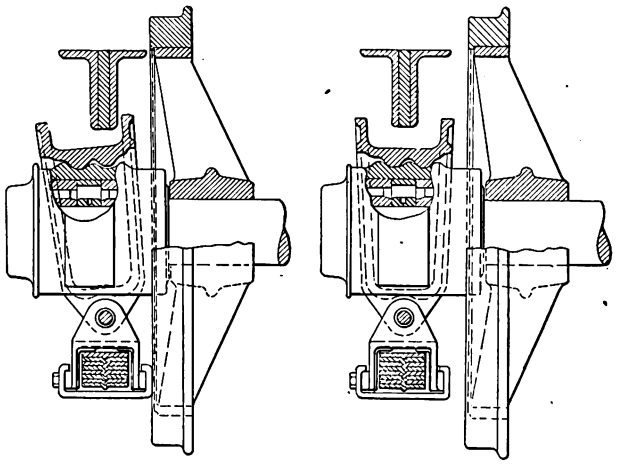
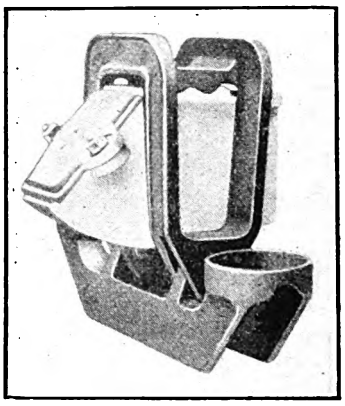




Normal (at Right) and Distorted Positions of Journal Box When Car with Flexible Suspension Negotiates a Short Radius Curve



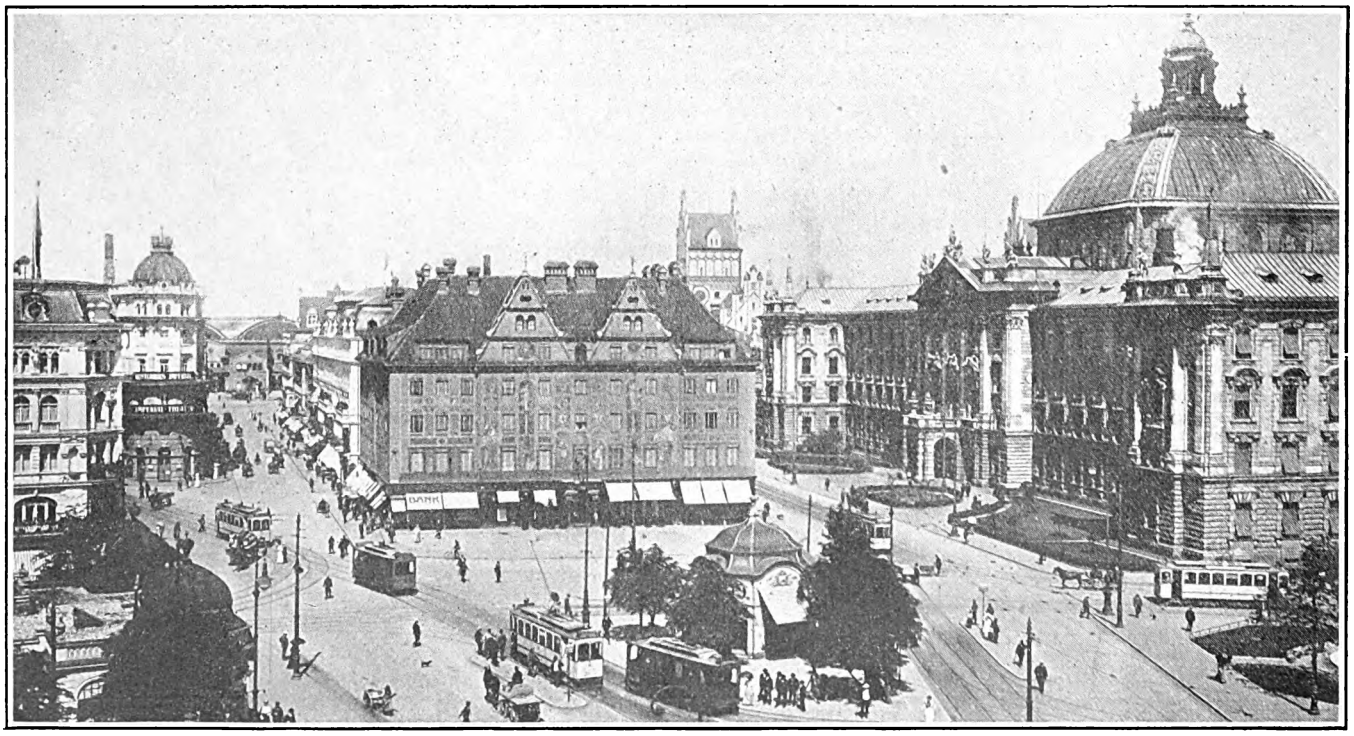
The Saddle Swings from the Top of the Journal Box to Permit Lateral Movement of the Axle

to resort to such a weight, neither speed nor traction. The handsome cars of the tramways from The Hague to Delft, double-truck vehicles that can carry about 60 passengers, weigh about 27 tons. On the other hand, in France the Transports en Commune de la Région Parisienne has reduced the weight of its cars to 517 lb. per passenger. The management of tramways at Berlin has gone farther still. There the weight has been reduced to about 365 lb. per passenger.

An American electric railway engineer inspecting the European systems often would be amazed at the absolute lack of effort at economy. This is true despite the difficult conditions under which operation must be carried on, conditions which indicate the real need for strict economy. Heavy cars and two-man operation are examples.

Tramways that own heavy equipment and have not sufficient funds for replacement are evidently excusable, but others which have ordered new equipment since the war certainly deserve blame for squandering money without the least reason. It has been stated as an excuse that a single-truck motor car carrying 50 passengers and weighing 13 tons will have a longer life than a car of 10 tons because the latter is less solidly built. This extra weight, however, costs 30 per cent more for power and 30 per cent more for wear. Is five years gain in the amortization of a car really worth the loss of all the economies realized during a period of perhaps twenty years?

Another thing to arouse the astonishment of the American railway engineer is the extravagant disbursements that the small systems allow themselves. For the past eight years it has been well understood in America that it is impossible to operate a system having light traffic in the same manner and with the same costs as a system having dense traffic.



Car Lines in Munich Converge at the Square in the Center of the City

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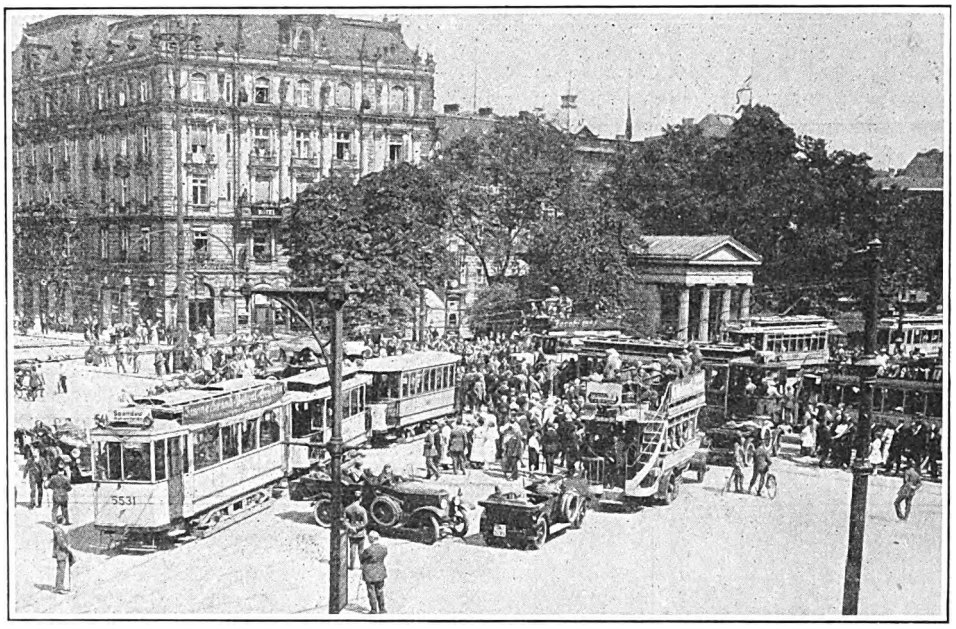
In the larger cities, where the cars are almost always full, the conductor has scarcely any leisure, particularly when a system of transfers or zone fare collection requires him to distribute tickets at five or six different prices. But on the smaller systems, where the cars carry on the average not more than ten to fifteen passengers and where there is only a uniform rate of fare, the employment of a conductor is really a luxury and so is an unwarranted outlay.

Why should the small systems thus continue to lose money when the introduction of the safety car or one-man car would certainly be their salvation? For example, there exist in France some twoscore struggling systems in provincial towns that might be changed into successful operation. What can possibly be the reason for this lack of progressiveness? It may be attributed above all, I believe, to the habit of routine, the conservative spirit which in Europe holds back the development of so many businesses. The ability of the managements often leaves much to be desired. Also, the fact that tramway operations are often conducted by financiers, rather than by business men, may have something to do with the matter.



Tramway Traffic in Potsdam Square, Berlin

Fault cannot be found with the systems in all the countries of Europe. One country that follows closely the advances made in the last few years is Holland. The equipment is modern, although somewhat heavy, as has been remarked, and very well kept up. For cleanliness it has not an equal either in Europe or in America. One-man cars are operated on all the small systems and even on several lines in Amsterdam.

In Germany, also, the majority of the systems maintain a high degree of progressiveness, except, however, in the matter of one-man cars. These one sees only in three or four small towns.

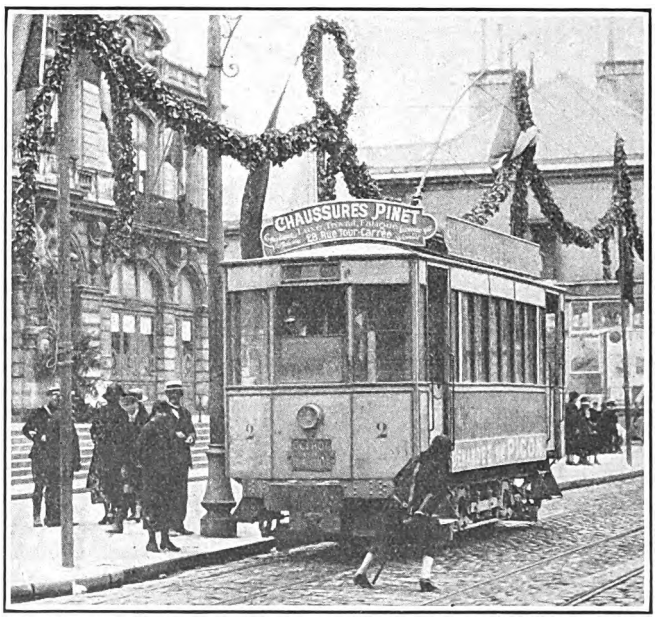
Tramways in the south of Europe reflect the character of the population. In Italy and Spain the equipment is generally in a deplorable state. Economies resulting from progress realized during the last ten years are absolutely unknown.

Greater Aggressiveness Is the Present Need

During the month of July an international convention of tramway men was held at Brussels. For the question of one-man car operation was reserved the honor of the first discussion on the program. The report on this subject pointed out the danger of the introduction of the one-man car not only to the public but also to the operators. Admitting that not all one-man cars may be considered safety cars, the report is perhaps not incorrect. In it no distinction is made, however, between a car which has not been equipped with a single safety device and a car equipped with all the apparatus necessary to place the operator as well as the passengers out of all risk of danger.

In any case, the fact that the one-man car was made the object of discussion at the convention promises that it may be more widely used. When one realizes how slowly and with what hesitation important measures have been adopted in the past, however, the employees of the tramways need not feel great anxiety.

For some enterprising Americans there is a great field of opportunity in the present European tramway situation. A financial group might well merge the small struggling systems for which European managements have not found the cure, and which in their incompetent hands go quietly but surely to death. The American financier, provided he be an electric railway man, could quickly instill life into the ailing systems by introducing technical improvements and numerous economies, such as the one-man car, which in a short time would put the business on its feet. A company whose stock is now quoted at 50 on the Bourse could attain in a year or two a quotation of 100 or more. In the tramway industry of Europe itself, however, the vigor and energy needed to accomplish such a change is lacking.



Many Provincial Tramways in France Have Antiquated Rolling Stock Similar to This Cherbourg Car

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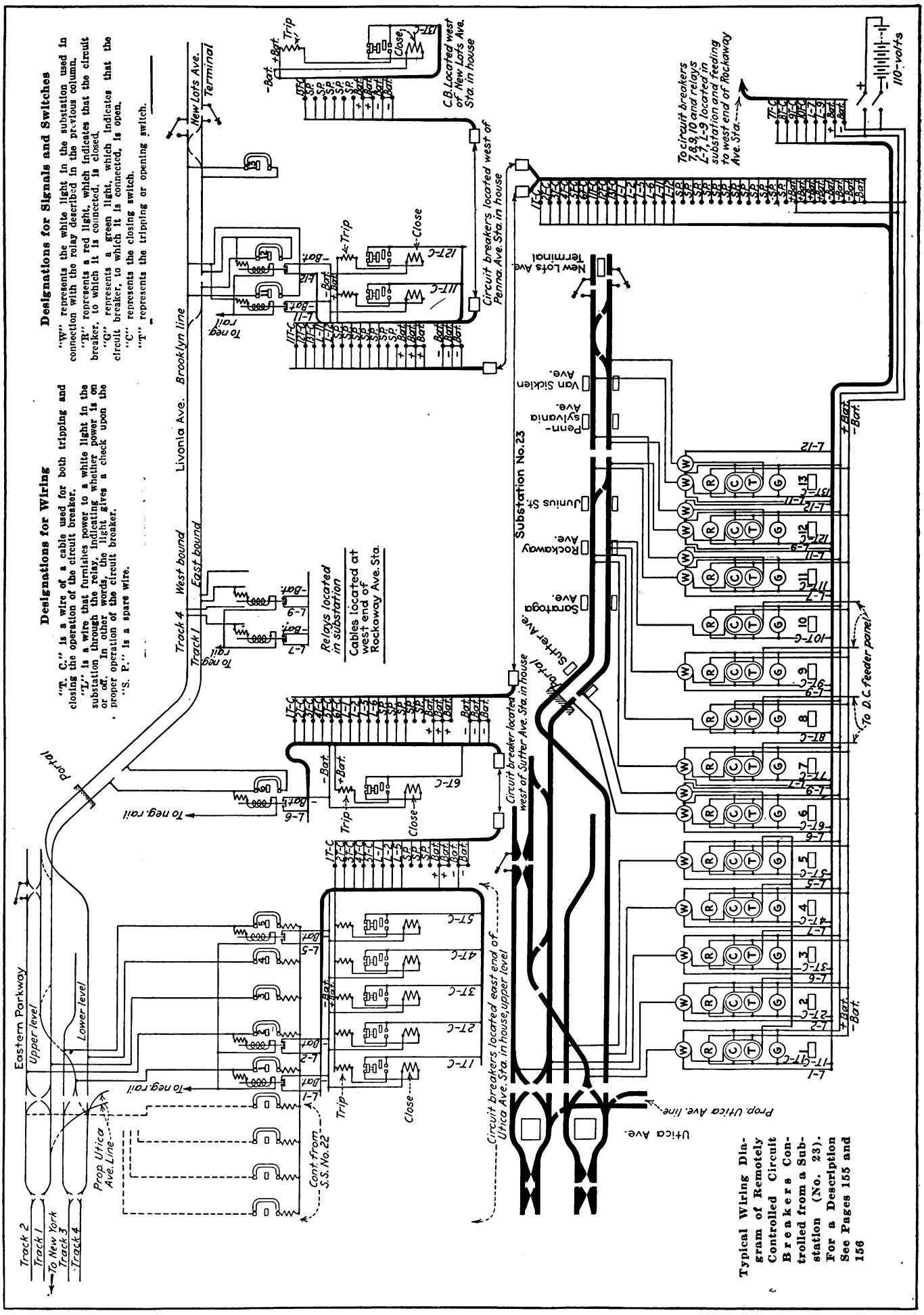

Typical Wiring Diagram of Remotely Controlled Circuit Breakers Controlled from a Substation (No. 23). For a Description See Pages 155 and 156

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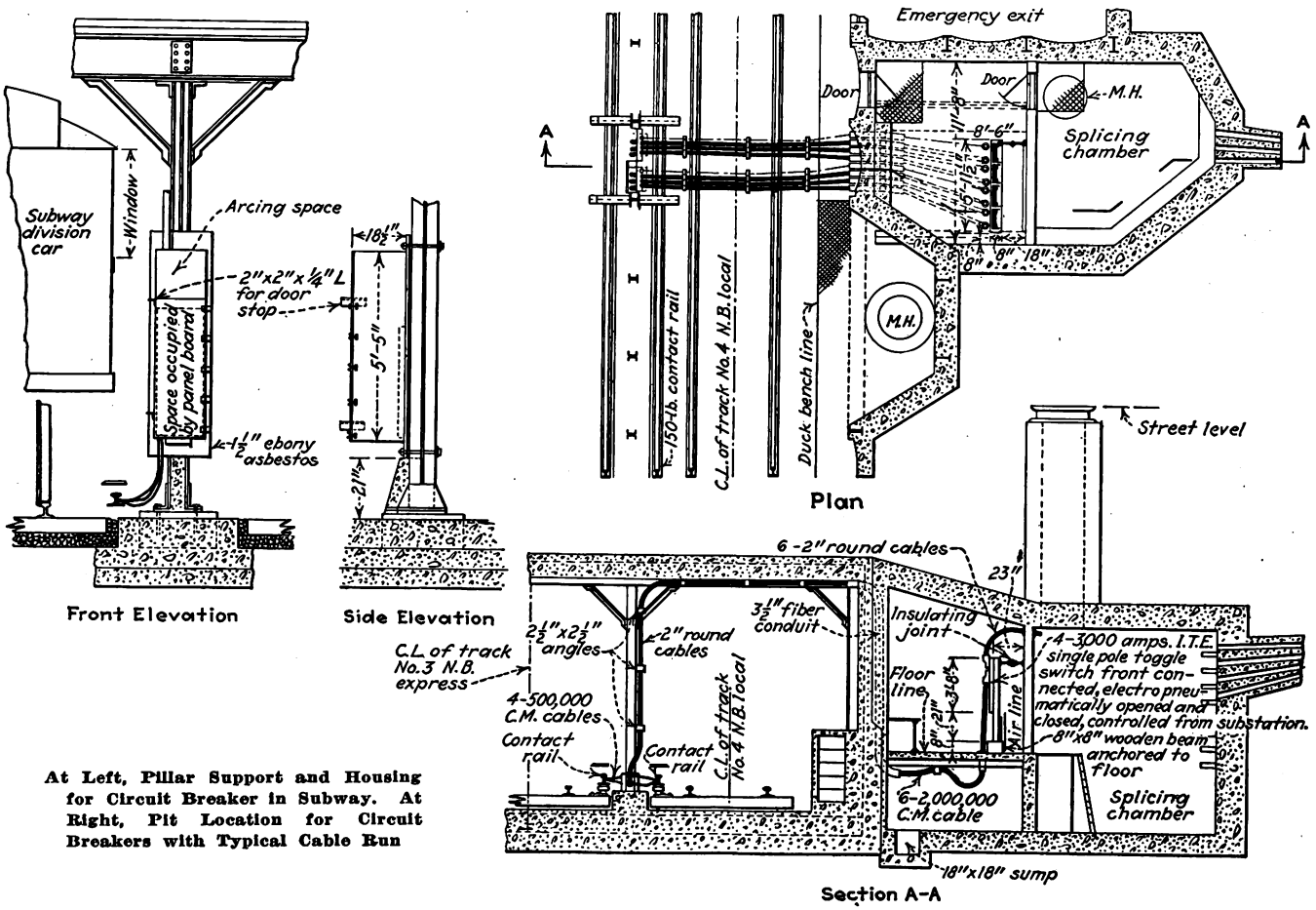
Power Distribution in the Interborough

The Contact Rail Sections Are Interlocked and Connected by Electro-Pneumatic Circuit Breakers and All Are Under Control from a Centralized Station—In Consequence, the Circuit Breakers Controlling an Entire Substation Section Can Be Opened Through an Emergency Alarm Whose Boxes Are Distributed Along the Walls of the Subway

ARTICLES in this paper last year discussed the numerous safety features and other improvements applied to the rolling stock of the Interborough Rapid Transit Company and other phases of its New York subway rapid transit service. Equal care has been used in the installation of the electrical distribution system to protect against accidents and electrical disturbances, as well as to safeguard passengers against possible delay through interruption.



At Left, Pillar Support and Housing for Circuit Breaker in Subway. At Right, Pit Location for Circuit Breakers with Typical Cable Run

Primarily the safety features of the system depend upon the sectionalizing of the third rail, the sections being electrically connected by electro-pneumatic circuit breakers, which are under remote control from a centralized control station. In consequence, the circuit breaker controlling a section, besides automatically opening in case of a super-current flow, will open if an emergency alarm is sent from one of the alarm boxes mounted on the subway wall in that section. Reference to this emergency alarm system in connection with the sectionalized distribution system has been made in previous articles in this series, particularly in that in the issue of July 25. In this article an account will be given of the method by which the contact rails are sectionalized and connected up and supplied with energy from the substations, as well as how the emergency alarm works.

Cable Connection to Contact Rail

The contact rail in the tunnels is protected from the adjacent structures, and particularly from the steel columns, by means of a specially prepared board carried over the top of the rail and supported by properly insulated posts. The cables which furnish power from the substations to the contact rails are of the concentric type—that is to say, there is an inner core that is positive, then a layer of insulation, then a layer of wires forming the negative conductor, then more insulation, and then an outer covering of lead. The purpose of this type of cable construction is to localize any trouble caused by short circuits.

At its outer end this cable terminates at a manhole in the side wall of the tunnel where the positive and negative portions of the cable are separated, the negative lead being connected to a bus and the positive

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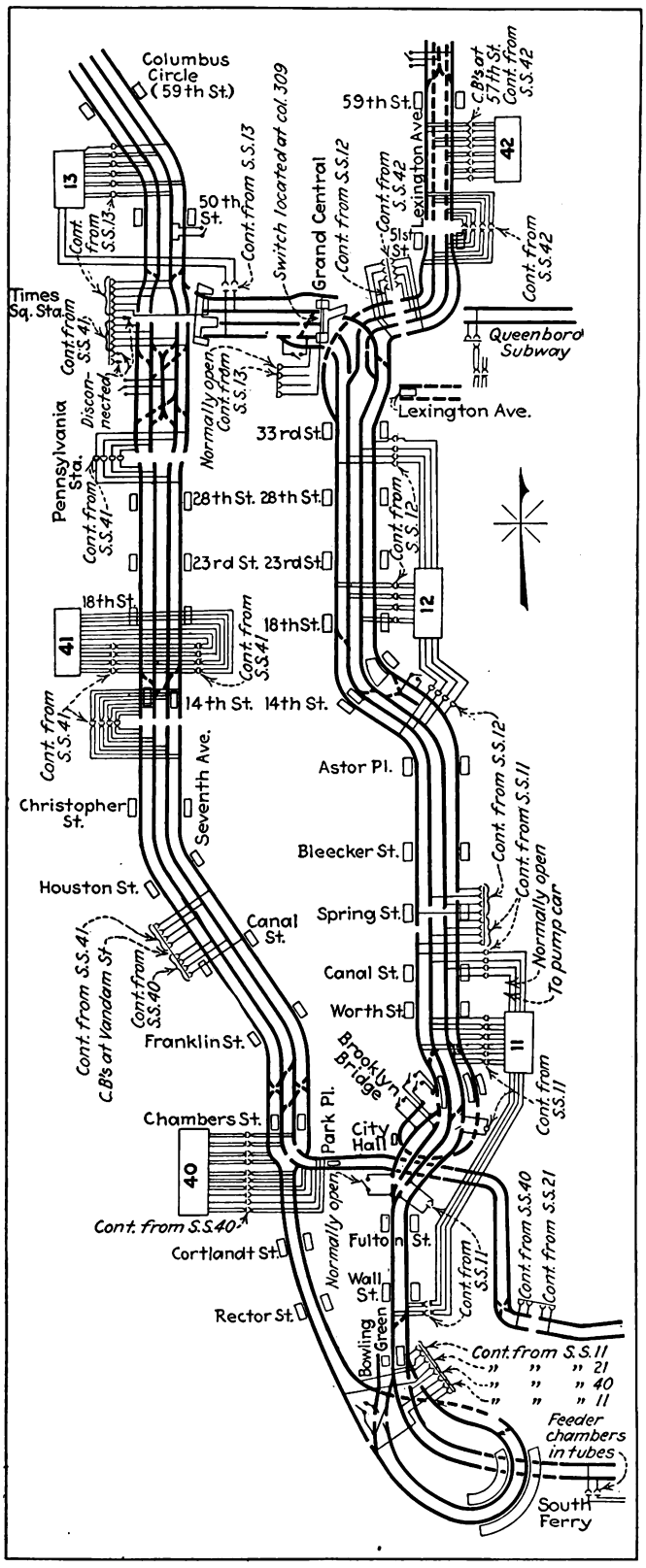
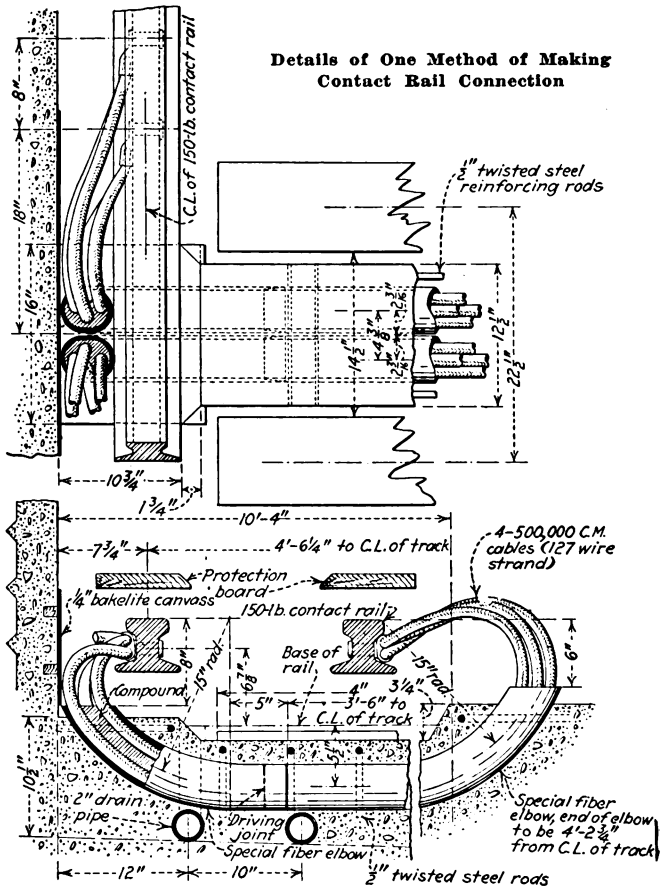


Portion of Positive D.C. Feeder Layout Showing Location of Substations, etc.

lead carried to a circuit breaker. The circuit breaker is of 3,000-amp. capacity and is equipped with an electro-pneumatic valve for the closing operation and a trip coil for the tripping operation. The circuit breaker is mounted on an extra heavy panel. In some cases, these circuit breakers are housed in fireproof boxes and mounted on the columns, as shown in the left hand drawing on page 153, but wherever possible, a separate concrete and steel chamber is constructed as



part of the subway structure, as shown in the right hand drawing on page 153.

The negative bus is mounted in a separate chamber immediately adjacent to the circuit breakers. The negative cables are then run from this negative bus to the track rails in fiber conduit, with a sufficient thickness of concrete around the conduit to prevent water from entering it and to protect it from damage that might be caused by its coming in contact with any heavy object, as well as to afford protection against fire.

The positive connection from the circuit breaker to the contact rail is made by means of 2,000,000-circ.mil cable, insulated by an extra heavy thickness of Kerite insulation, and where it is necessary to install this cable on the steel beams it is further insulated by porcelain insulators. This 2,000,000-circ.mil cable is terminated in a specially devised pothead, constructed of concrete where it is changed to four smaller cables more easily to permit of its being bonded into the contact rails to its full capacity. This change in the size of cables is made by a mechanical connector that permits of ready disconnection whenever necessary.

At all locations where it is possible the positive cables are run underneath the track bed in the way already described for the negative cables, except that as a further insurance against the collection of moisture in the conduits under the track the conduit is filled solidly with a cable compound. Some idea of this detail may be gained from a study of the drawing above, which shows one of the several methods of making the connection, the one used depending upon conditions.

Control of Energy Supply

Power is furnished to the contact rails from substations located approximately 2 miles apart. The contact rails within the section supplied by power from

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8-Cent Fare Granted to P. R. T. by Pennsylvania Commission

By John A. Dewhurst
Associate Editor ELECTRIC RAILWAY JOURNAL

Report of the Commission Is Briefed and an Outline of Interesting Events Leading Up to This Last Decision Is Presented—History of Case Just Concluded Extended Over Nearly Two Years and Was Fraught with Interference by the Governor That Strikes at the Very Heart of Good Public Utility Regulation

BY ORDER of the Public Service Commission of Pennsylvania the Philadelphia Rapid Transit is permitted to charge an 8-cent cash fare with a 7½-cent token, two being sold for 15 cents. The order of the commission, dated Jan. 12, makes permanent the temporary grant made on Sept. 8, 1924, that increased the fare from 7 cents cash and 6½-cent tickets (four for 25 cents).

There has been perhaps no more interesting series of cases in the annals of public utility regulation than those recently held in Philadelphia. The last case, started July 21, 1924, has been a climax to a series of proceedings which has kept the company before the Public Service Commission and the courts of the commonwealth without important interruption since June, 1920.

During this last case Gov. Gifford Pinchot caused considerable trouble by dismissing Commissioners Benn and Shelby. The Governor assigned no reason for his action, but it was inferred that he was displeased with the progress of the P. R. T. case and the attitude that the commission was assuming. The Superior Court of the state finally overruled the Governor and allowed the commissioners to resume their seats on the commission.

The report and order of the commission under date of Jan. 12 was approved by four of the seven commissioners, a bare majority. Richard W. Martin dissented, and in a memorandum states that he will file a minority report as soon as he can prepare it, and Commissioners Scattergood and Evans refrained from voting on the report for the reason that the Bureau of Cost and Statistics will not be able to complete its analysis of certain specific testimony for several weeks.

Following the decision granting the fare increase based on the commission's report, abstracted below, Governor Pinchot again indicated his displeasure by withdrawing from the Legislature the reappointment of Commissioner John L. Stewart of Bethlehem, Pa., apparently because Mr. Stewart was one of the four commissioners voting in favor of the commission's order.

Since the announcement of the commission's decision, many claims and counter-claims, some quite bitter in their content, continue to fly back and forth.

Prior to June 1, 1920, the company charged a 5-cent cash fare and at many important transfer points, largely in the downtown district, charged an additional 3 cents for an exchange transfer, although it had many more in number of so-called free transfer points. The company's first proposal and also its second proposal, submitted in October of the same year, called for a basic 5-cent fare and the elimination of practically all of the 3-cent exchange tickets and a charge at certain other transfer points. Both were condemned by the commission.

About the same time there was a serious break in the board of directors of the company over the type of fare structure, whether it should be an increase along the lines of retaining the 5-cent basic fare desired by T. E. Mitten, then president of the P. R. T., or a horizontal increase keeping the fare structure essentially the same. The break in the board of directors finally resulted in the resignation of E. T. Stotesbury of Drexel & Company, and several other banking members of the directorate, who were in sympathy with Mr. Stotesbury's views. Prior to the disagreement of the board of directors, the question of the type of fare increase was submitted to three nationally known engineering concerns. The majority opinion of these engineers was in favor of the horizontal increase and they recommended the fare that was finally ordered by the Public Service Commission on Oct. 18, 1920, of 7 cents and four tickets for 25 cents. The commission directed that this fare be charged for a period of six months; and at the end of the six-month period the company on its own motion continued in effect the fare prescribed by the commission.

The city of Philadelphia and certain local associations protested any increase and asked that a valuation of the company's properties be determined and be used as an aid in fixing the reasonable rates. On Sept. 23, 1920, the commission began to hold hearings and receive evidence bearing upon the fair value of the company's propery, which proceeding soon became known as the valuation case.

The commission states in its report that the record produced in this case was the most extensive ever made in any of its proceedings, and contained evidence upon nearly every subject pertinent to the pending issue. The hearings were not concluded until May 15, 1923, and on June 21 of the same year the commission handed down its findings of the then present fair value of the company's property of "substantially upward of $200,000,000." The fair return allowed by the commission was 7 per cent, equaling $14,000,000 annually.

The city of Philadelphia and other individuals, not including the company, immediately appealed the case to the Superior Court of the Commonwealth. This court affirmed the findings of the commission and established two important things: First, that the fares then in effect were lower than those on he average elsewhere and, second, that the fares were not yielding the

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minimum fair return which the company might demand under its constitutional rights.

During the intervening years it appears that Mr. Mitten has temporarily abandoned the 5-cent fare theory, although he has often since then publicly stated that he believes this fare would produce the best results to the company and the public served. On July 21, 1924, the company filed its application in the present case, asking permission to increase its cash fare from 7 to 8 cents and its token fare from 6¼ to 7½ cents. Again the city of Philadelphia and others protested, and hearings before the commission were started on Sept. 2, 1924.

Assuming the burden which rested upon it, P. R. T. went forward with evidence in support of its application, which the commission has stated established, *prima facie*, three things: First, that the 6¼-7-cent fares had not earned the allowable gross revenue or net revenue, indicated in the valuation decision; second, that commencing in the spring of 1924 and continuing through the summer, the extent of riding had decreased and was decreasing; third, that some increase in expenses had to be met apart from the increased labor costs, which it was claimed in 1925 would be $1,700,000 higher than in 1923. After hearing and cross-examination, the city moved for adjournment on Sept. 6, in order to prepare its case. Two days later the adjournment asked for was allowed, and at the same time the commission granted the P. R. T. permission temporarily to collect the fares asked for. The commission realized that the case would be drawn out over many months and desired to provide an actual test of the proposed fares in place of estimates.

Once again the city and other protestants appealed from this decision. On Sept. 19, 1924, the Superior Court denied the request that the appeal act as a *supersedeas*, filing an opinion wherein it held in part: "The hearing before the commission made out a *prima facie* case justifying the proposed increase in fare. This, *prima facie*, may be rebutted or overcome by evidence produced by appellants when they have completed their investigation; but, when the hearing adjourned, the burden resting upon the company had been met."

So much for the appeal as a *supersedeas*. Upon the appeal itself the Superior Court at the hearings and final arguments handed down its opinion on Dec. 5, 1924, affirming the report and order of the commission. It is worthy of note that the commission's action was thus affirmed despite the court's holding that the wage dividend as then paid by P. R. T., amounting to $1,900,000 yearly, was not a proper charge against operating expenses.

The proceedings during this case and in the months that followed, were fraught with much bitter feeling and caustic comment by many individuals and groups. The commission, unswerving in its performance of duty, commenced subsequent hearings in April, 1925, and concluded them in September of the same year. It had before it at the close of the hearing a full twelve-month record of gross earnings under the new fare, so that the briefs and arguments developed no important disputes on this item. While the commission supported the company's view as to the question of increases, it frequently had to rule upon arguments presented by the company, one of which is of general interest and is cited in the commission's report.

In its brief the company advanced the following conclusion and contention: "The simple fact is that the Philadelphia rider pays the average price for a service vastly superior to the average. It conclusively refutes any claim that the fares charged are more than the service is reasonably worth."

The commission states that it cannot accept this argument. In the words of the report:

> While the record does demonstrate that the company's service is notably a good service as compared with other cities, and while it also appears that the present fares are not higher than the approximate average prevailing elsewhere, these facts alone cannot establish the conclusion upon which the company insists. . . . It is also true that proper comparisons furnish some tests of the value of the service, but no final conclusion on that subject is possible without considering the cost of the service to the company. Throughout all business life cost has a direct and important bearing on value, and to determine value without an investigation of cost is well-nigh impossible.
>
> We should not be understood as holding that cost is the sole or absolute measure of a reasonable rate, for our courts have decided that: "Rate making contemplates fair dealing between the company and the public. . . . The mere assurance that the investment will not be confiscated will not suffice."

The commission's report altogether is contained in a 34-page typewritten statement. It goes on to analyze in detail the revenue and the operating expenses, paying particular attention to such points as were attacked in the arguments of the protesting parties to the case.

During these long discussions, lasting through many months, the company argued with great earnestness that the system of public utility regulation in Pennsylvania does not take from the managers of utilities the rights, duties and discretion of management; that the regulating body is not vested with the powers of management, and cannot substitute its discretion for that of the managers, and that the commission's only function in passing on the reasonableness of operating expenses is to correct any gross abuses of managerial discretion, if such appear. To this argument the commission replies in its report:

> This proposition is too broadly stated. Conceding that the commission may not itself assume the discretion of management, it is nevertheless clear that it is the commission's duty to see that discretion is reasonably exercised and to check and correct any unreasonable exercise of it.

Wages presented an interesting argument in these hearings, since at the beginning of the hearing the company paid a maximum of 70 cents per hour and a 10 per cent wage dividend, making in effect the total wage to trainmen 77 cents per hour, which the company admitted to be the highest wage paid to street railway trainmen throughout the country in 1925.

It may be explained here that the so-called wage dividend was established by P. R. T. several years ago and applied to all employees. This dividend was to be paid only if earned and after the common stock dividend. By the consent of the employees' association this dividend was paid into a pool, from which the common stock of the company was purchased in the open market.

Following the acceptance of this wage as not unreasonable or excessive, the report passes to the legal question, and the following extract from the commission's report is of interest:

> Prior to 1925 the company's wage arrangement included a contingent payment limited to 10 per cent of the base wage and designated a wage dividend. The bargain with the men provided that they should receive a certain base wage on each pay day and at the end of the year an additional payment up to 10 per cent, but payable only after payment of the current dividend to stockholders. All pay-

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ments of this wage dividend were made to trustees for the men, who invested the money in the stock of the company almost exclusively.

The company in the past treated this wage dividend precisely like all other wage payments; that is, as an operating expense. The lawfulness of this course was first questioned upon the appeal from our temporary order in the present case. In brief and argument upon that appeal, the city urged that the contingent feature of this payment placed it subordinate to dividends upon the company's stock and therefore made it in law a payment out of profits, and not an operating expense. The Superior Court sustained this contention. . . .

This commission does not interpret the foregoing as containing any expression of opinion by the court as to the amount of a proper wage. It is clear that the wage dividend was removed by the court from operating expenses solely because of its contingent feature.

Subsequent to this decision, the company in April, 1925, abolished the wage dividend and raised the base wage to 77 cents, which it undertook unqualifiedly to pay to its men.

Unquestionably this action removed the contingent feature above discussed from any portion of the 77-cent wage and no argument to the contrary has been advanced. Concededly this action was taken in view of the Superior Court's decision and in our view it fully met the requirements of that decision.

The fact that a part of the resulting total wage is, by the men's direction, paid to trustees designated by them and invested in the stock of the company does not render such payment any the less a wage. Such arrangements are not uncommon in our industrial life. In the present case the records show that the men have unanimously authorized the arrangement and further that upon retirement from the service or upon death every man or his personal representative as the case might be received from the trustees the proportionate share of the funds in their hands. In the meantime they and they alone receive the income. . . .

After a long and detailed discussion on the question of maintenance, the commission states:

Upon a careful consideration of all the evidence bearing upon this question, the commission concludes that the company's maintenance and renewal appropriation does not appear unreasonable and it would not be justified in disallowing any part of it as proper operating expenses.

In the same way the commission supports the company's contention as to the operating expenses under Power and Conducting Transportation. Referring to the general and miscellaneous accounts, the company urged that these expenses had been high because they included several large items for litigation expenses that may not recur. The commission contends that while they may not, it cannot say that they will not, for the company, like any other citizen, has an inalienable right to defend or assert its rights in all appropriate courts and tribunals.

The commission again stated that it cannot undertake to become the manager of this or any other utility and substitute its discretion for that of the manager, and concludes that for the reason given it is not warranted in disallowing any part of the company's 1925 general and miscellaneous appropriation of $4,750,880 as proper operating expenses.

In examining the tax items under consideration, the commission held that each item would be allowable or disallowable judged on the basis that the company owned outright the entire system and held that leases (several of which the P. R. T. holds) that only passed on a tax, but did not create a new tax, should be allowed in the company's budget, just as if the company owned the physical property outright. The company cited many decisions of state and federal courts substantiating their opinions on this subject.

The report states that the applicant owns all the stock of the Philadelphia Rural Transit Company, operating the bus lines in the city of Philadelphia and adjoining counties, as well as of the Pennsylvania Rapid Transit Company, which operates a line of trackless trolleys in South Philadelphia. While no investigation was made as to the operating expenses and revenue of these companies, nor were their respective properties included in the valuation, the report states that "it appears, however, that during 1925 the Philadelphia Rural Transit Company incurred a deficit of about $200,000." The commission states that it is of the opinion that it is not called upon to determine at this time whether the operation of motor buses should be considered as merged in and consolidated with the street car operation in a rate proceeding.

The results of the determination of the commission with respect to revenues and expenses are summarized as follows:

OPERATING REVENUES		
Estimated passenger revenue	$49,018,357	
Other operating revenue	707,000	
Total		$49,725,357
OPERATING EXPENSES		
Maintenance and renewals	$8,560,400	
Power operation	3,885,000	
Conducting transportation	15,942,000	
General and miscellaneous	4,750,880	
Taxes	2,951,491	
Frankford Elevated rental	468,120	
Total deductions from operating revenue		$36,557,891
Operating income		$13,167,466
Non-operating income		235,000
Available for fair return		$13,402,466

This amount of $13,402,466 is below the return contemplated as fair in the valuation case, even when the deduction of $444,000 on account of federal income tax is included in the equation. When it is considered that the Frankford rental alone increased during 1926 in the sum of $156,000 and that increases will also occur in substantial amounts in gross receipts and taxes and other items in the operating budget, the margin will be accordingly increased.

German Street Car Accidents Analyzed

CAUSES of accidents and the means of their reduction are dealt with at some length by Herr A. Wolf in a recent issue of *Verkehrstechnik*. Taking as a basis the traffic accidents in Germany from 1899 to 1919, the figures relating to street railways show that 43.77 per cent of the accidents were sustained by passengers and 56.23 per cent by pedestrians. Of the total only 8.38 per cent were due to street railway operation. The majority of passenger accidents were caused by boarding or alighting while the cars are running, sudden application of the brakes, and collisions. Folding steps and gates on the rear platforms would, he believes, reduce accidents due to the first cause.

Although less than 10 per cent of the accidents are due to rolling stock and the work of the operating staff, the writer considers that steps should be taken to secure a reduction. More attention should be given to improvement of brakes. Stops should be selected with great care and when they are located in the middle of the roadway safety zones should be provided. The author believes that running the street cars along a route off the public highway would not only reduce the number of accidents but enable a higher speed to be safely maintained. In conclusion, greater attention to trolley lines and more careful selection and training of the railway staff are recommended.

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The Readers' Forum

Committee on Management and Operation Planning Big Program

NEW YORK CITY, Jan. 16, 1926.

To the Editor:

It has been at times apparent that there has been some confusion about the purpose and work of the committee on management and operation. This is perhaps natural, partly because of the comparatively short time this committee has been in existence and partly due to the broad scope of its activities.

In attempting to clear away any misunderstanding that may exist, it might be advisable to set forth briefly the history that led to its organization. This work was first conceived by Britton I. Budd when he was president of the American Electric Railway Association. Originally there were two committees, known as the committee on city operation and the committee on interurban operation. Their function was to make an actual survey of conditions in the industry and preach the gospel of modernization. Although these two committees have been combined into one and the name changed to the committee on management and operation, Mr. Budd's original thought of modernization has been consistently carried on through two years.

The committees by visits to properties in every section of the country have discussed with electric railway operators the solution (through the adoption of modern methods and practices) of the most important problems with which the industry has been faced in recent years. These discussions have covered such matters as the automobile and the motor bus; public relations; employee relationships; popularizing service; operating economies; accident prevention; traffic congestion; development of freight business, and the reduction or elimination of unfair tax burdens. At the outset one of the important functions of the committee was the exchange of ideas and the dissemination of information regarding modern methods, made possible by visits of key men or field men of these committees to the various properties.

As a result of its survey the committee is now publishing a handbook in which will be found brief descriptions of modern methods of management and operation of electric railways in use here and there in the industry, but which may be applied on almost any property in the country and should eventually become standard practice when this influence is felt.

The regional directors outlined at their meeting held during last November the procedure for this year's activities. This program will be reviewed and plans made for field work at the meeting in Indianapolis.

In following the procedure outlined by the regional directors who constitute the advisory committee, it will be the duty of the members not only to disseminate the information collected in past years through the use of the Handbook on Modern Methods but also to collect additional information of a similar nature. Acting for Lucius S. Storrs and President Coates, members will seek suggestions as to the outstanding things that should be done by the association for the improvement of conditions in the industry. When deemed advisable the managers of properties visited may arrange for interviews between members of the committee and representatives of the public press. Executives will be urged to make greater use of their state committees for the dissemination of public utility information. Members will attempt while visiting executive and department heads to acquaint them more intimately with the activities of the association headquarters.

At the request of the executive committee this year the committee on management and operation is planning to co-operate with the committee on education by carrying to the properties visited its message pertaining to industrial education. This message is designed to set forth the value of employee educational work, as distinguished from employee training, and to outline the preliminary and practical steps necessary to start educational work on an electric railway property.

The committee on management and operation has been enlarged this year to 63 members, with a view to having a sufficiently large personnel to enable its representatives to visit again each of the 137 companies reached last year and in addition as many more as possible, either members or non-members, of the association.

R. F. CARBUTT,
Chairman Committee on Management and Operation.

Ministry of Transport Authorizes 1½d. per Passenger-Mile

NOTTINGHAM CORPORATION TRAMWAYS
NOTTINGHAM, ENGLAND, Jan. 11, 1926.

To the Editor:

In the abstract of my recent paper on fares, published in your issue of Dec. 26, there is a typographical error on page 1118 in the reference to the fare authorized in the model clause for tramway undertakings of the Ministry of Transport. The figure should have been 1½d. and not ½d. per passenger-mile. As corrected the sentence will read:

> In certain special acts promoted recently in relation to tramway undertakings, a Ministry of Transport model clause has been inserted, authorizing charges at the rate of 1½d. per passenger per mile.

A. A. JACKSON,
Technical Assistant.

Footing the Bill for Car Improvements

Jan. 20, 1926.

To the Editor:

I note in the Jan. 16 issue of the JOURNAL that a new committee has been appointed to study comfort and appearance of cars. It strikes me that the committee will not get much further than the noise committee did last year. That committee submitted a lengthy report at the last convention, but no one at the meeting took enough interest in it to discuss it either pro or con. So it looks to me like "love's labor lost." It is all very well for a lot of engineers to theorize and say that we should do thus and so to bring our cars up to a certain standard. But how are we going to get the money to do it? When we have to run everything to the limit and then some, to keep our expenses down, how can we afford to add the frills? Down our way we have run out of our supply of Aladdin's lamps, and unless the committee can scare up some new ones it cannot sell its wares.

Personally, I feel that our cars should be kept more quiet and should be improved as to comfort and convenience, but until our road earns more money and is in a position to spend some of it on equipment it looks like a hopeless task.

MASTER MECHANIC.

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Association News & Discussions

International Tramway Convention in Barcelona

Program Just Issued for Convention of International Association to Be Held in Spain in October

BARCELONA, SPAIN, has been selected for the twentieth international convention of the Union Internationale de Tramways, de Chemins de fer d'Intérêt local et de Transports Publics Automobiles, with headquarters in Brussels, to be held this year. An invitation was received to go to Barcelona from the Mayor of that city. The convention will be held there during the first half of October. The program for the technical sessions of the association follows:

1. *City Planning:* A study of the three conclusions reached by Mr. Delavenne in his paper at the Paris convention of 1924 on the place of the public carrier in city planning. (a) Local city transportation systems assist in distributing the population of a city, in encouraging the movement out from the center, and in increasing to some extent the ability of the city to gain inhabitants. (b) Transportation lines are also most helpful in building up undeveloped territory, but their routes in such districts should be laid out under the direction of an impartial and disinterested commission. (c) Transportation lines should seek to supply a service providing a maximum of speed, consistent with the physical and other limitations present, and capacity at all times, so far as it can be done with economy in operation and first cost.

The speakers on subject No. 1 are Mr. Jayot, inspector-general of local transportation in the Prefecture of the Seine, Paris, and Mr. Delacroix, engineer of the Barcelona Tramways.

2. *Publicity and Other Methods to Reduce Accidents.*

Speaker—Mr. Junyent, chief of service, Barcelona Tramways.

3. *The Economic Situation.* Percentages of the total operating expenses caused by the principal items of expense (wages, power, maintenance, etc.) and percentages of the principal items making up operating revenue in the different countries from 1914 to 1925. Effect on the local transportation industry of the general economic situation. Possibility of the determination of an economic index applicable to variations in fares.

Speakers—Messrs. L. Boulle, manager Compagnie Générale Française de Tramways of Paris; Bouteau, manager of the Compagnie Générale des Chemins de fer Vicinaux of Paris, and Haerens, manager of the Consolidated Railway of Belgium.

4. *Merchandising of Transportation.* Facilities supplied in the way of (a) scheduled speeds; (b) distances between stopping points and method of marking stopping points; (c) special methods to speed up service economically during the rush hours.

Speaker—P. Mariage, manager of transportation of the Paris Tramway System.

5. *Standardization of Electric Railway Motors.*

Speakers—Mr. Peridier, director of research Paris Tramway System, and Roman Podoski, professor at the technical school at Warsaw.

6. *Track Switches.* Switches of the automatic type and other switches operated from a distance on electric railway lines, particularly those with high traffic density.

Speakers—Mr. Battaille, manager of the engineering department Liége Tramways, and Mr. Stoffels, chief engineer of the Amsterdam Municipal Tramways.

7. *Power Distribution.* Results from automatic substations, substations controlled at a distance, and mercury-arc rectifiers.

Speakers—Mr. Lombard-Gerin, general manager Omnibus & Tramway Company of Lyons, and Mr. Odermatt, engineer of Brown-Boveri & Company, Inc., Baden.

8. *Rail Motor Cars.*

Speakers—J. De Croes, manager Société Nationale des Chemins de fer Vicinaux of Brussels; F. Level, manager Compagnie Générale de Voies Ferrées d'Intérêt local of Paris, and Commander Mellini, chief inspector for the government of railways, tramways and automobiles in Italy.

9. *Ties.* The results obtained during and after the war with substitute ties, notably those of steel and concrete.

Speaker—Mr. Burton, chief engineer on track to the management of the Société Nationale des Chemins de fer Vicinaux of Belgium.

10. *Buses and Bus Operation.* Design of bus bodies, including dimensions, arrangement of seats, steps, facilities for handling baggage; chassis, springs, tires, and other equipment.

Speakers—M. Chauchat, manager of the Société Industrielle de Transports Automobiles of Paris, and J. De Croes, manager Société Nationale des Chemins de fer Vicinaux of Belgium.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Jan. 26-29—Society of Automotive Engineers, Annual Meeting, Detroit, Mich.

Jan. 27—New York Electric Railway Association, Hotel Commodore, New York, N. Y.

Jan. 28-29—Central Electric Railway Association, Lincoln Hotel, Indianapolis, Ind.

Feb. 5—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8 p.m.

Feb. 11—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.

Feb. 18—A.S.C.E., A.S.M.E., A.I.E.E. and A.I.M.M.E., joint meeting, Engineering Societies Building, New York, N. Y., 8:15 p.m.

Feb. 24-26—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

Unification of Wire and Sheet Metal Gages Proposed

THE American Engineering Standards Committee has been requested by the Society of Automotive Engineers to take up the unification of wire and sheet metal gage systems in order to arrive at a national standard system of designating the diameters of metal wires and the thicknesses of metal sheets. The systems of gage numbers by which these products are generally designated at present have been developed and adopted in the course of time in different trades and for different products, as steel and copper wire, aluminum, brass and zinc sheets, etc. Thirteen gage systems are now in use in this country. This wide diversity necessarily leads to confusion. Some organizations, in order to avoid such confusion, have done away with gage numbers entirely and designate wire and sheet metal sizes exclusively in decimal fractions of an inch.

A conference of all industrial groups interested in this problem will be called in the near future, to discuss the desirability and possibility of unifying the various existing gage systems into a consistent national system or systems. A question closely connected with that of the designation of wires and metal sheets is whether or not it is feasible to thin out the series of diameters or thicknesses actually listed in the catalogs of the different trades. Inasmuch as a procedure of this nature involves the element of "simplification," the A.E.S.C. and the Division of Simplified

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Practice of the Department of Commerce have made arrangements to co-operate actively in this matter. The latter body will undertake to bring about production surveys in the trades concerned, in order to find out the relative importance of wires and sheets made to the several gage numbers.

Oklahoma Utilities Choose Tulsa for 1926 Meeting

TULSA has been selected for the eighth annual convention of the Oklahoma Utilities Association. It will be held at the Mayo Hotel, March 9, 10 and 11 next. This announcement was made by E. F. McKay, manager of the association, at the conclusion of the quarterly meeting of the executive board held recently. Extensive exhibits by manufacturers of public utility equipment will be an important feature of this convention.

Illinois Utilities' Joint Convention

ON WEDNESDAY and Thursday, March 17 and 18, 1926, the sixth annual joint convention of the Illinois Electric Railways Association, the Illinois State Electric Association and the Illinois Gas Association will be held in Springfield, Ill.

A program of interest to every branch of the utility industry is being prepared. As in the past, there will be joint morning sessions and separate afternoon sessions for each association. The joint sessions and all railway association sessions will be held in Hotel Abraham Lincoln.

Applications have been made for reduced railroad fares. If these are granted identification certificates, acceptable over the Illinois Traction System as well as over the steam roads, will be sent out with the programs, which will be available about March 1.

Diesel Electric Locomotive vs. Electrification

POSSIBLE effects of the Diesel electric locomotive on heavy electrification will be the subject of an important meeting to be held on Feb. 18 at the Engineering Societies Building, 33 West 39th Street, New York.

The meeting is to be held jointly by the Metropolitan sections of the A. I. E. E., A. S. C. E., A. S. M. E. and A. I. M. E. The principal speakers of the evening will be C. B. Stein, general manager Central Railroad of New Jersey; Hart Cook of the MacIntosh & Seymour Corporation and N. W. Storer of the Westinghouse Electric & Manufacturing Company.

American Association News

Traffic Congestion

WAYS by which the electric railways can help in the solution of the serious problems of traffic congestion were discussed at a meeting of the committee on traffic congestion, held at the Statler Hotel, St. Louis, Mo., on Jan. 8. Communications on traffic congestion from R. W. Emerson, C. H. Evenson, H. J. Lockwood, W. E. Thompson, G. B. Anderson, J. A. Miller, Jr., J. A. Greig, E. S. Rider, R. B. Hill (supplementing Mr. Anderson's communication), A. W. Brohman and W. H. Maltbie were read.

Mr. Fink of the Pittsburgh Railways told the committee of conditions in Pittsburgh and of the success of efforts to secure co-operation from the city traffic committee, which worked with the company to eliminate traffic congestion, accepting in a great many cases the recommendation of the traffic engineer of the Pittsburgh Railways.

D. L. Fennell briefly outlined the conditions in Kansas City, and recommended that efforts be made by the committee to get outside influences, such as the Hoover committee, to co-operate with the committee. G. B. Anderson, in discussing Mr. Fennell's remarks, stated that national organizations interested in traffic congestion would co-operate with this committee, and spoke very interestingly of the conditions in Los Angeles and the success that Los Angeles has had with the Property Owners' Association.

C. H. Evenson briefly outlined parking conditions in the Loop district in Chicago, and stated that his company had not pushed the "No Parking" idea and would not do so until the public had been educated to the benefits to be derived from "No Parking" rules. He also stated that by rerouting cars and eliminating left-hand turns a wonderful improvement had been made in traffic congestion, and cars had been speeded up a great deal in the congested area. He told of the success of the efforts of his company in working with the Chamber of Commerce, and recommended that the committee work out a standard traffic code.

S. W. Greenland, representing the United Railways of St. Louis, outlined the plans that the company has worked out, and also spoke of a further plan of one-way streets that will soon be submitted to the city traffic authorities, which, he stated, would be of great benefit in eliminating traffic congestion on the streets of St. Louis. He stated that the city of St. Louis has a central traffic committee composed of three officials. Mr. Greenland also told of the efforts of the railway to educate property owners as to their loss by the decentralization of business. Talks along this line were also made by Messrs. Anderson and Evenson in discussing Mr. Greenland's remarks.

It was decided that the committee should get in communication with the Hoover committee, calling its attention to the activities of the A.E.R.A. committee.

Mr. Anderson outlined the success they had in Los Angeles in regulating pedestrian traffic. He also stated that automatic traffic signals were working very satisfactorily in Los Angeles and speeding up all traffic. Mr. Evenson recommended that a number of talking points along the line of traffic elimination be taken up and if possible "sold" to the public, such as the number of passengers carried on the cars as compared with automobiles, etc.

Chairman Meyers appointed Mr. Greig a committee of one to get a report of all cities that have had traffic surveys made.

Mr. Fennell stated that in securing a motor coach franchise for three years from the city for the Kansas City Railways the number of stops per mile and designated loading zones had been incorporated in the franchise. He suggested that all companies figuring on securing franchises in the future incorporate this idea, as it does away with all unnecessary stops and thus speeds up the schedules.

Mr. Anderson suggested working along the lines of getting a law compelling drivers of all commercial vehicles to pass a test before being allowed to drive. He stated that if a test of this kind would be required better men would be on commercial vehicles, and this would go a long way toward relieving traffic congestion.

Mr. Greig recommended the adoption of a standard traffic code. Mr. Evenson suggested that the committee come back to the next meeting with some concrete ideas on a standard traffic code. Mr. Fink suggested that some thought in the making of this code be given to cruising taxicabs.

Chairman Meyers suggested that each member of the committee draw up a set of traffic rules, and use as far as possible the recommendations of the Hoover committee; that he thought it would be of benefit for each company to try to organize in its city a committee to work with the company in the adoption of rules for the purpose of regulating traffic.

The next meeting will be in Cleveland on April 2.

Members present were: A. R. Meyers, chairman; G. B. Anderson, J. A. Greig, C. H. Evenson, R. W. Emerson, J. P. Pope, D. L. Fennell, A. J. Fink and J. P. Tretton.

Steel Industry in Movies at Next Metropolitan Meeting

STEEL, the giant industry, will be the subject for the next meeting of the Metropolitan Section, A.E.R.A., to be held at the Engineering Societies Building, New York City, at 8 p.m. on Feb. 5. G. A. Richardson, manager technical publicity department Bethlehem Steel Company, will give the address on this subject, which will be illustrated by several reels of motion pictures.

Entertainment features that will follow will be provided by employees of the Third Avenue Railway system.

The usual Dutch-treat dinner, which has become a feature in connection with the monthly meetings of the Metropolitan Section, will be held at Keene's Chop House, 36th Street east of Sixth Avenue, beginning promptly at 6:15.

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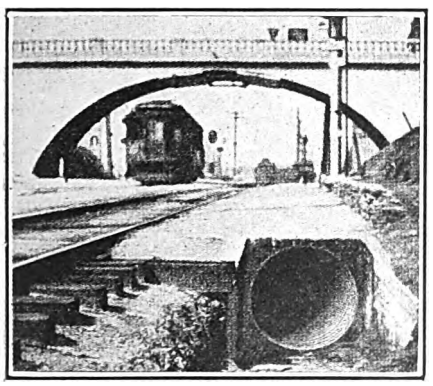
Maintenance of Equipment

Good Drainage Necessary at Interurban Car Stops

SOILS of all kinds with a variety of drainage problems are encountered by the Pacific Electric Railway on its interurban system. This company operates more than 1,100 miles of electric interurban lines and has approximately 1,500 car stops. As explained by Clifford A. Elliott, cost engineer for the company, the landings at stops are placed on each side of the track and are



Corrugated Iron Culvert Installed Under Passenger Landing at Vineyard Station of the Pacific Electric Railway

located over drainage ditches adjacent to the roadway. It is thus frequently essential to provide longitudinal culverts under them to care for proper removal of water.

Years ago, when some of these landings were first built, many redwood box culverts were installed. The life of these culverts averaged about five years, and the company tried other methods of construction in order to secure longer life. For the past fifteen years the company has used Armco corrugated iron culverts, particularly where a large amount of water had to be carried away, and where the damage that might result from inadequate drainage would be great. The corrugated iron culverts used average from 12 in. to 18 in. diameter and extend the full length of the landings, which are from 75 ft. to 350 ft. long. To carry out the effect of a standard landing construction, cobble-stone end retainers are provided. The quarry waste material in the landing, being white in appearance, can be readily observed by trainmen when approaching the landing at night. The end retainers are also whitewashed to carry out the light effect. This construction is proving satisfactory and economical.

COMPARISON OF COMPANY RECORDS

Company	Car-Miles	Total Pull-Ins	Chargeable Pull-Ins	Car-Miles per Chargeable Pull-In
New Orleans	15,060,906	232	79	190,644
Nashville	5,499,214	145	44	124,982
Knoxville	2,678,720	128	68	39,246
Memphis	7,482,110	571	391	19,136
Birmingham	11,271,437	869	726	15,525
Atlanta	13,093,604	1,071	760	17,228
Mobile	2,113,361	211	152	13,904
Texas Electric	5,654,158	574	407	13,892
Little Rock	2,787,415	289	216	12,905
Covington	3,899,801	538	270	14,444
Dallas	8,916,818	1,365	914	9,756
Chattanooga	2,393,433	839	628	3,811
All companies	80,850,977	6,832	4,655	17,350

Pull-Ins Compared for Southern Properties

COMPARATIVE statements of car pull-ins for the twelve months ended December 31, 1925, have just been compiled by the Electric Railway Association of Equipment Men, Southern Properties. These show a total of 6,832 pull-ins for all causes, of which 4,655 were chargeable to equipment. Car-miles operated by the twelve companies comprising this association total 80,850,977. Average car-miles per chargeable pull-in for all companies were 17,350. The highest mileage per chargeable pull-in was recorded by the New Orleans Public Service, Inc., as was also the case for the year 1924. Second place went to the Nashville Railway & Light Company. A comparison of the pull-in records of the electric railways in the twelve cities is given in an accompanying table.

Reports compiled by the association show also the causes of pull-ins. For the year just ended the largest number, 1,258, resulted from failure of car wiring and control apparatus. Under this head are included circuit breakers, line breakers, controllers, contactors, relays, headlights, lighting fixtures, lightning arresters, electric bells, trolley wheels, rheostats, motor leads, cables and field jumpers. Next in point of number were the failures of armatures, armature shafts and armature bearings, totaling 1,036. Brakes and brake riggings were responsible for 769 failures. Miscellaneous troubles with car bodies, seats, heaters, etc., caused 501 pull-ins. Wheel, gear, truck, axle and journal failures numbered 402. Failures of motor fields numbered 394. Commutators, brushes and brush-holders were responsible for 295 failures.

Cars pulled in on account of derailments, broken doors, broken glass or accidents are classified as being chargeable to transportation rather than to equipment and are not listed as chargeable pull-ins. A summary of the causes of chargeable pull-ins on these Southern properties is given in an accompanying table.

SUMMARY OF CAUSES OF PULL-INS

	New Orleans	Nashville	Knoxville	Memphis	Birmingham	Atlanta	Mobile	Texas Elec.	Little Rock	Covington	Dallas	Chattanooga	Total
Armatures and armature bearings	20	12	11	105	234	186	31	63	16	64	184	110	1,036
Commutators and brushes	1	5	0	54	33	63	3	37	5	3	53	38	295
Fields	9	2	0	21	141	83	18	11	16	15	48	30	394
Car wiring	17	12	32	82	109	231	40	145	69	75	291	155	1,258
Wheels, gears and trucks	9	3	3	24	102	80	11	35	25	14	37	59	402
Brakes and brake rigging	23	8	18	30	59	95	30	70	67	39	199	131	769
Car bodies	0	2	4	75	48	22	19	46	18	60	102	105	501
Total	79	44	68	391	726	760	152	407	216	270	914	628	4,655

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Improvements in Old Type Motors*

DECREASED maintenance has been effected through a number of changes made in construction details of old type motors operated by the Denver Tramway, Denver, Col. Some motors had the ventilation intake at the bottom of the motor shell and trouble was experienced from dirt, leaves and snow being drawn inside it. A new duct has been welded on the outside of the shell so that air is taken in at a higher point. This has decreased short circuits and increased the life of carbon brushes practically 300 per cent.

Armature bearings of the old style had end cover plates fastened on with three screws. These were a source of considerable trouble due to their working out and permitting water and dirt to enter to bearings. Bearings were destroyed and armatures rubbed on the pole faces so as to require rewinding. This condition has been remedied by casting these bearings with a hole tapped for ¾-in. brass pipe plugs. With this arrangement the loosening is prevented.

Some old-style General Electric type 58 motors had field coils wound with round wire. The insulation had become baked and the fields short circuited so as to require scrapping. Field coils are now wound with a flat copper ribbon insulated between turns with asbestos tape, in the most approved manner. When a field wound in this manner becomes short circuited it may be rewound and the same copper ribbon can be used indefinitely.

On many of the old-style motors the field terminals were attached to the winding through a piece of flat copper soldered to both terminal and the field winding. This strip gave considerable trouble due to breakage, and to remedy this a strip of flexible copper braid is now used to attach the terminal to the field winding.

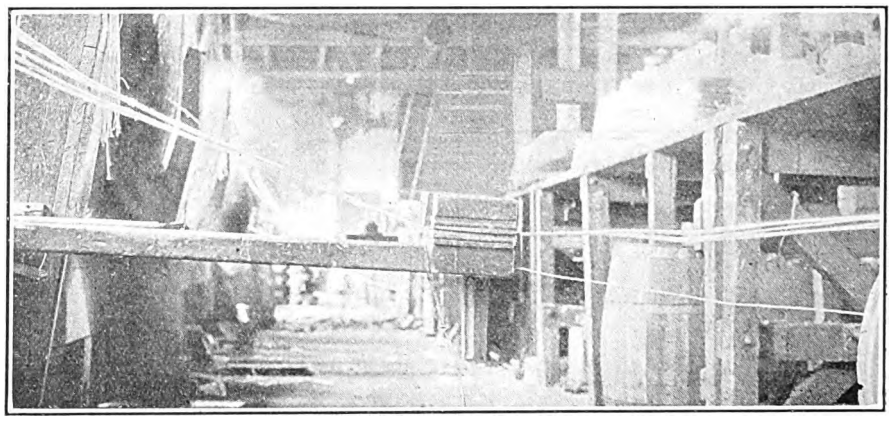
Brush-holders on some of the old-style motors were fitted with non-adjustable tension springs so that when the spring weakened a new one was required. A new brush-holder casting has been designed so that a modern adjustable coil spring with hammer can be used and proper tension is maintained at all times.

On some armatures the connections for the bottom leads from the coil are brought out straight to the commutator. Vibration caused considerable breakage in these leads. This trouble has been almost entirely eliminated by placing a bend in the bottom lead before attaching it to the commutator. This allows for expansion and contraction and relieves the strain on the wire.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

Fiber Plates Keep Tension on Armature Wire

SIMPLICITY is the outstanding feature of a device arranged in the Albany Street shops of the Boston Elevated Railway to keep tension on the wires used in winding armature coils. Two flat fiber plates are attached to the outer end of a wooden arm extending from the winding bench toward the wire reels. The wires pass between the plates. The latter are held in position by a pair of bolts which pass through the wooden arm, the plates, and a wood block which rests on them. By tightening the nuts on these bolts the fiber plates are brought close together and greater tension is secured in the wires.

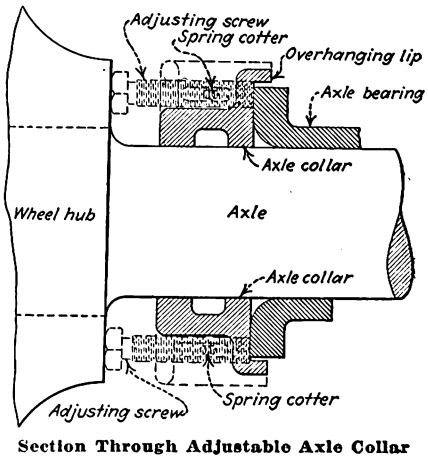


Armature Winding Wires Pass Between Fiber Plates Bolted to the End of a Wooden Arm

Keeping Motor End Play to a Minimum

MAXIMUM allowable end play of railway motors should be from ¼ in. to ⅜ in. These limits are desirable since, if they are exceeded, the gear may rub and cut the inside of the gear case, and these figures for end play correspond to the average clearance between the gear and inside of the gear case on standard types of railway motors. Since the axle collar limits the end movement of the motor, it is naturally subjected to wear. Checking of the amount of motor end play is therefore a necessary part of motor inspection. If axle collars are neglected and adjustments are not made at regular inspection periods the end play becomes excessive and the motor is subjected to excessive side movement and pounding. This is particularly noticeable when the car is rounding a curve or running on rough tangent track.

Axle collars are made of several different types, and as a result several different methods for taking up the wear are used. Probably the most general method is to take up the end wear on axle bearings by means of split rings, either of iron or of hard fiber. These rings are made of different thicknesses, and when opened up are forced over and around the axle, between the collar and the wheel hub. Babbitt metal has been used by some railways instead of using the metal or fiber rings. This has proved very satisfactory, but of course requires the removal of the axle collar for babbitting.



Section Through Adjustable Axle Collar

In order to provide a positive and permanent means of taking up the end play on axle collars due to wear an adjustable type has been de-

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veloped by the Westinghouse Electric & Manufacturing Company. The accompanying drawing shows this type of axle collar in its location on the car axle. This type of axle collar is provided with two adjusting bolts, the heads of which are backed up against the wheel hub. These bolts can be backed off the distance necessary to make the collar long enough to take up the maximum allowable axle bearing flange wear, after which the worn bearings should be replaced by new ones.

On some types a dust-protecting, overhanging lip is used. This affords a protection against the entrance of dust and dirt on to the rubbing surface of the axle collar and the axle bearing flange. This protection reduces the wear at this point and consequently lengthens the life of the bearing. Some operators have objected to this lip as it interferes with the removal of the motor from the car axle. Removal, however, can be carried out satisfactorily if the work is done in the following order: (1) Remove the pinion and axle; (2) remove the lower half of the pinion end axle bearing; (3) remove the top half of the pinion end axle bearing; (4) shift the motor on the axle against the gear, and (5) remove the commutator end axle cap and bearing without disturbing the axle collar.

Circuit Breaker Testing

A NEAT circuit breaker testing outfit is a part of the equipment of the Beaverton, Ore., shops of the Southern Pacific Company. It includes the necessary switches and panels mounted on a platform with wheels. Two Edison A-12 storage-battery cells furnish 600 amp. at 3 volts and can provide a 500-amp. discharge for two minutes. The usual type of resistance proved unsatisfactory so a carbon resistance pile is now used, and this gives extremely small graduation of the current.

New Equipment Available

Tapered Body, High Angle Dump Truck

GREATER speed and safety in dumping sticky loads, combined with an auxiliary five-speed transmission, gives extra power and flexibility to a new heavy-duty dump truck built by the White Company, Cleveland, Ohio. The new model 52-D has an auxiliary transmission affording the equivalent of five speeds and gives extra low-gear pulling power for high hill climbing and getting out of holes or mire. A new dumping mechanism and tapered dump body are other improvements which are combined with a big sturdy tubular type radiator; spring cradles on the frame; a wide, heavy pressed-steel bumper; heavy easy-working steering gear; an air temperature regulator that saves fuel and adds to engine efficiency in all seasons; heavy springs; reinforced frame of chrome nickel steel, and brakes with drums of a special metal that insure quick, certain stopping and long brake life.

The auxiliary transmission gives maximum flexibility of power. It enables the driver to gear down to the hardest pull when it is needed, and it allows the main transmission to work at a higher top speed on the level. Power is transmitted in a straight line from the starting crank to the rear axle when operating under load.

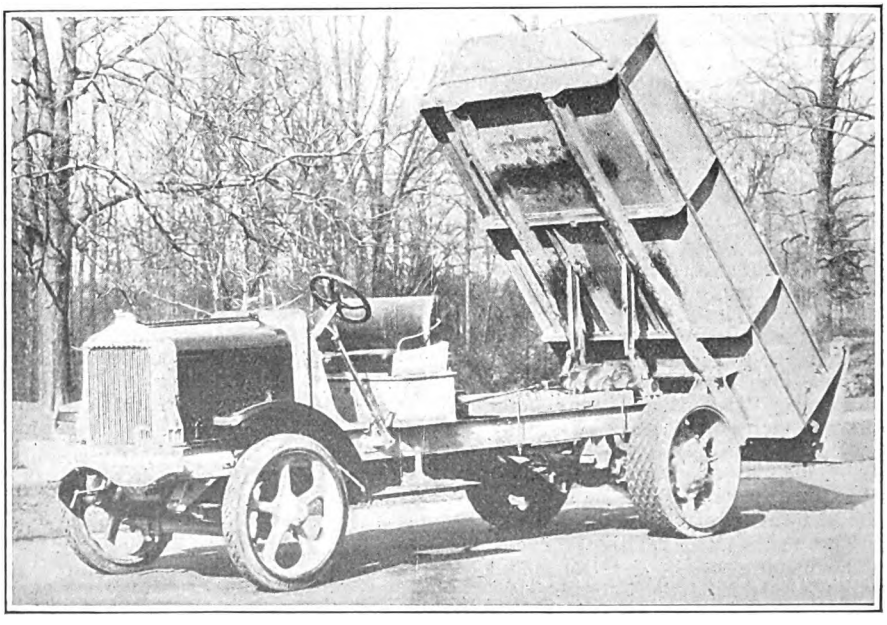
Incorporated in the same case with the auxiliary transmission is the mechanism which operates the dumping hoist. The tapered dump body is raised on sturdy arms and links by means of a gear drive. It lifts to an angle greater than 50 deg. The body is under positive control in all positions and may be held at any angle. It is lowered by the same mechanism that hoists it, but can be lowered while the truck is in motion.

The body is mounted so that load weight is properly distributed and the dumping point is far back. A double-acting tail gate facilitates dumping and the low-body sides make loading from the ground exceptionally easy. The dumping mechanism is set solidly down in the frame in a dirtproof and weatherproof housing. The gears run in oil.

The wheelbase of the model 52-D is 156 in. It has solid tires, 36x6 front and 40x12 rear.

Aluminum Graphite Paint

RECOMMENDED particularly for use wherever a light colored paint is required, the Joseph Dixon Crucible Company, Jersey City, N. J., has just brought out an aluminum graphite paint. It is composed of aluminum and flake silica-graphite as a pigment and boiled linseed oil as a vehicle. The aluminum is of flake formation and thus combines easily with the flake graphite. These flakes lapping over like fish scales provide a covering of unusual elasticity and durability. The combination of aluminum and graphite results in a paint that, it is said, is not affected by gases and fumes. It resists sunlight, air and moisture and its reflecting qualities keep temperatures of cars considerably lower than is possible with darker paint.



A High Dumping Angle with Improved Hoist Mechanism Are Features of the New Heavy-Duty Dump Truck

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The News of the Industry

Rochester Road to Operate Line in Abandoned Canal Bed

That the New York State Railways eventually will operate the subway rapid transit and industrial railroad in the bed of the abandoned Erie Canal in Rochester, N. Y., is indicated.

At a conference held recently of the Citizens Committee, named by Mayor Van Zandt to study the operation of the new line, with James F. Hamilton, president of the railways, Mr. Hamilton was asked to submit to the committee figures on the sum the company would pay the city for its use.

Payment was to be figured, it was said, on a car-mile basis for each car, both interurban and city, as well as freight cars.

This step was taken to mean that the committee on receipt of the railway's figures would recommend lease of the subway railroad to the traction company.

The 8-mile line from the west end of Rochester to the eastern limits, constructed by the city, is virtually completed and much speculation was aroused as to its operators.

The report of the committee is expected to be submitted to the Mayor in the near future.

Terminal and Transportation Plan Outlined for Newark

The Pennsylvania Railroad, the city of Newark and the Public Service Corporation of New Jersey have recently reiterated their willingness to enter upon a program for the expenditure of $25,000,000 for the erection in Newark of a new union terminal and the laying of a vast network of high-speed surface lines, linking northern and western New Jersey with Newark as the natural gateway to New York.

The plans in detail contemplate the abandonment of Manhattan Transfer, the extension of the Hudson Tube system to southern sections of Newark, three double-track steel bridges over the Passaic River to accommodate increased traffic brought about by the transfer from electric to steam locomotives at Newark, and the erection of a Pennsylvania passenger station and steam terminal at Wright Street, in the down-town section of Newark.

Thomas W. Hulme, vice-president of the Pennsylvania Railroad in charge of real estate, has sent a letter to Mayor Raymond of Newark, asking that official to name a committee to go into conference with the railroad committee.

The railroad, Mr. Hulme said, has $12,000,000 ready for expenditure, while it is estimated that Newark and the three arms of the Public Service system will each share in the expenditure of an additional $13,000,000. Transportation systems involved in the plan include steam and electric railway lines, electric surface and subway lines and buses.

The Public Service Railway and railroad branches have the most definite transportation plan outlined for them. This includes, first, a high-speed surface line into north Jersey and the west of Essex County for the feeding of passengers into the Newark Terminal. Considerable rerouting of surface car lines will also result when the terminal is built.

Rerouting Plans for Detroit

Car rerouting plans affecting three major street car lines in the downtown district of Detroit have been presented to the City Plan Commission by the Department of Street Railways. Under the proposed plan, Grand River and Hamilton cars would be turned south at West Park instead of Griswold Street and Woodward Avenue, the Grand River-Jefferson cars going over West Park, State and Griswold Streets south to Jefferson Avenue, and Grand River-Capitol Park cars turning north on the east side of Capitol Square Park. The Hamilton cars would also follow this latter route, thus taking them off Woodward Avenue. The new routings are planned to relieve congestion around Capitol Square Park and facilitate traffic movements.

Two lines of tracks are proposed in place of the one now on the east side of Capitol Square Park between State Street and Grand River Avenue, with loading platforms on the east side of the park. Subway walks from the loading platform to the east side of Griswold Street are proposed to provide easy ingress and egress. This will give a wider thoroughfare for vehicular traffic, minimize interruptions to traffic and provide safety for the car riders who board cars or disembark at this point.

New Grant for St. Louis Discussed

Mayor Outlines Fundamentals He Believes Should Be Incorporated in New Operating Grant—Company Favorable to Mayor's Service-at-Cost Suggestions

VICTOR J. MILLER, Mayor of St. Louis, Mo., has outlined the requirements he believes should be incorporated in any new franchise granted by the city to the St. Louis Public Service Company, as the United Railways will be known when the reorganization is finally consummated. The Mayor stated he would insist that the franchise be submitted to the citizens under the initiative or referendum provisions of the city charter.

In his brief the Mayor favors co-ordination of service (presumably of buses and street cars); the right of the city to determine the kind and character of service to be rendered at cost; the right of the city to acquire the property if it should desire to operate the transportation system or have some agency other than the company operate it; and the adoption of a service-at-cost plan that will insure a fair return to the investors in the company. After reviewing the place which adequate transit plays in city development the Mayor says in part:

> The citizens of St. Louis do not expect to receive something for nothing, but they do expect their money's worth. The city will require that any company operating its transportation service shall invest large sums of money in extending and improving that service. If such money is to be secured through private investment, it can only be secured if the investor is given a fair assurance of interest on his investment and its ultimate return to him. Any ordinance which the city may promulgate and which in our opinion will assure the best service at the minimum cost to the users should originate from or be submitted to the people.
>
> Operation must be carried on pursuant to the terms of a new modern and up-to-date franchise. I intend to cause an ordinance to be drafted that will protect the city and its citizens. This ordinance should be submitted to the people of St. Louis for their approval. Any company which wishes to operate in St. Louis must comply with all its terms.
>
> I favor a franchise which would give the city the right to determine the kind and amount of service to be rendered at cost. I favor a co-ordinated service to eliminate waste. The city must have the right to acquire the property, in case it should desire itself to operate the system or to cause it to be operated through some other agency. The investor should be given reasonable assurance of a fair return on his investment. Not only must the city be entitled to prescribe the kind and amount of service which is to be furnished, but it must give careful thought to the means of permitting such service to be efficiently operated. Mass transportation is essential.
>
> This administration is making a careful study of the traffic situation. To some extent we can profit by the experience in other cities. Any transportation company operating in St. Louis must be willing not only to conform to such traffic regulations as may be promulgated, but must also spend such sums as will be necessary to rearrange and reroute its cars.
>
> Transit by subways or elevated must come in the future, and the work of planning and laying out the transportation system so that it will facilitate such development must be started now. In the meantime, however, we can accomplish much, both as to speed and amount of transportation service, by properly regulating traffic.
>
> As soon as possible there will be submitted to the St. Louis Public Service Company certain fundamental propositions which the city will insist must be a part of any ordinance submitted.

J. K. Newman of Newman, Saunders & Company, in charge of the United Railways reorganization, was in St. Louis on Jan. 18. In commenting on Mayor Miller's statement he said that he was satisfied with the Mayor's declaration. He agreed that any fran-

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chise should be submitted to the people for a final vote.

A statement about the matter, approved by the reorganization committee of the United Railways, follows in part:

In general, the views of Mayor Miller are acceptable because they represent a modern policy which has prevailed in many of the largest cities in the settlement of the difficult problem of establishing transportation on a sound basis.

Perhaps the most important feature of Mayor Miller's program is the adoption of the service-at-cost system. In short, this means that the value of the property established by the State Public Service Commission must be accepted by the company as the agreed value of the railway system. On such valuation the company will be allowed to earn only a fair rate of return and no more. No private business enterprise in St. Louis could accept such limited and restricted right to earn, but the company recognizes the trend of the times and will accept what has been adopted as a fair policy in other cities.

The interest of the public requires that the new franchise should become effective at the earliest possible moment so that the receivership may be terminated. Publicity should be given to each and every point involved. If the public desires that the franchise should be approved by the people at the polls, then the city authorities should so provide, even though such procedure would involve added delay and expense.

The fare to be charged under a service-at-cost franchise will depend entirely upon the kind and character of service. A railroad traveler cannot ride in a Pullman car at the price paid in a day coach. The company again indorses Mayor Miller's policy that the character of service should be controlled by the city and the car riders. Such service should not be inferior to the best service in other large cities merely to keep the fare at too low a level, nor should it be so extravagant that it will necessitate a fare beyond the wishes of a majority of the patrons.

The city can do much to keep the rate of fare down by not imposing on car riders unnecessary burdens of taxation, street paving, franchise assessments, licenses and other charges entirely controlled by the city. These charges now imposed by the city and collected from car riders constitute a part of the fare charged. If these burdens are not placed upon the car riders, they and only they get the benefit thereof, as under the service-at-cost system the company, for the life of the new franchise, will be confined to a limited return on the valuation of the property fixed by the Public Service Commission.

The company must have the fair return on investment, since it cannot procure from investors the large sums necessary to provide for better service unless such investors are given a fair assurance of interest on their investment and ultimate return of capital. No transportation company can succeed without the confidence and support of the city, the public and the press.

Service Survey Suggested in Milwaukee

Latest developments growing out of the Milwaukee Electric Railway & Light Company's commission-approved plan to install one-man cars on its Walnut Street line in Milwaukee, Wis., starting March 1 centers around a statement issued by S. B. Way, president of the company, in defense of the one-man car. Cars of this type are already in use on four lines in Milwaukee to keep down operating costs, but further economies in operation are necessary, according to Mr. Way, if the railway division is to earn the return on its investment allowed by law. According to Mr. Way earnings for the single-fare area reached only $7,825,045 in 1925 in contrast with $7,933,763 in 1924, a difference of $108,718. In 1925 cars operated a total of 17,651,161 miles against 17,538.831 miles in 1924. As a move intended finally to put at rest any question about the adequacy of the service rendered the Railroad Commission has decided to survey the railway service situation.

Santa Claus in Safety Hall

Wives of Louisville Officials, Headed by Mrs. Barnes, Put Human Touch Into Railway

Of all places for old Santa to show up, isn't Safety Hall, Louisville, one of the most appropriate? Anyway, that is just what he did. More about that later. Safety Hall is one section of a building which for many years served as the shop of the Louisville Railway. In April, 1921, when the company was in need of a place of its own to celebrate the victory of safety over carelessness, this particular section of the old shop building was fitted out with a dining room, kitchen and lounge room, appropriately dedicated to the interest of safety. Each month since that time the victors in the railway's accident elimination contest have put their feet under the well-filled tables of Safety Hall.

Early in the fall of 1925 Mrs. James P. Barnes, wife of President Barnes, communicated with Santa Claus and exacted a promise from him that he would appear in person with a present for each child of every employee at a special Christmas party. With this important part of the program disposed of, Mrs. Barnes called to her assistance Mrs. F. H. Miller and Mrs. Samuel Riddle, the wives of the two vice-presidents of the company, and began the task of finding out how many children there were, their names, ages and sex, so that old Santa would not suffer the embarrassment of presenting a doll to some sturdy boy or an air rifle to a curly-headed little girl. Through the foremen of departments, the names, ages and sex of all children between the ages of one and twelve years were obtained and an appropriate toy was wrapped separately and the child's name placed on a package for each of the 1,200 children. Even if one's experience has been limited to purchasing, wrapping and marking only presents for the members of his own immediate family he can easily imagine the labor necessary to perfect the plans for the crowd which gathered at this tree.

Information from Santa to the effect that the Christmas rush would make it necessary for him to appear at Safety Hall on Dec. 21 and 22, the first day for white children, the second for colored children, started a large corps of willing workers making the necessary preparations to welcome him. The hall was beautifully decorated with evergreens and draped with icicles and snow. A Christmas tree reached to the ceiling. It was decorated with hundreds of sparkling ornaments and colored lights stood just inside the hall to bring forth exclamations of wonder from the happy kiddies as they entered.

In order to expedite distribution, the presents were placed in alphabetical order in bins along the wall, and when the crowds of happy youngsters arrived they found old Santa himself at the door to greet them and personally conduct them to one of his many assistants, who promptly placed their own present in their hands and invited them to eat all the ice cream cones they desired while looking at the tree or enjoying the warmth of the big log fire in the old-fashioned fireplace in the lounge room before leaving for home.

Care was taken by the ladies in charge to see that any children who by reason of sickness or other disability were unable to attend the party received their presents at home. A surplus of toys was on hand in case any one had been overlooked. The left-over toys, of which there were quite a number, were divided equally between the children at the City Hospital and the Family Service Organization.

Awards Made for Station Names on North Shore Line

The nine stations on the new Skokie Valley route of the Chicago, North Shore & Milwaukee Railroad—the North Shore Line — were officially designated on the map recently when the committee of judges announced its decision in the $1,000 award station-naming contest. The names of the stations with the winners of the nine $100 awards follow:

Station No. 1—Harmswoods. Winner, Mrs. J. A. Barber.

Station No. 2—Glenayre. Winner, Ogden A. Clemens.

Station No. 3—Wau-Bun. Winner, Bertha F. Gordon.

Station No. 4—Northbrook. Winner, Northbrook Civic Association, Northbrook, Ill.

Station No. 5—Woodridge. Winner, Mrs. Marjorie M. Weese.

Station No. 6—Briergate. Winner, Bessie R. Alexander.

Station No. 7—Highmoor. Winner, Mrs. Gertrude C. Crane.

Station No. 8—Sheridan Elms. Winner, Mrs. Belle Falwell.

Station No. 9—Skokie Manor. Winner, Dorothy Shanderg.

Sheridan Elms was chosen by the judges as the most appropriate name among all those suggested. Mrs. Belle Falwell, who won with this suggestion for Station No. 8, was also given the special award of $100 for this name. Checks for $100 have been mailed to each of the persons suggesting names chosen for the new stations.

Each suggested name was judged on its practicability and simplicity, historical value and originality.

The judges complimented the North Shore Line on its progressive attitude in permitting the people of Chicago and the North Shore to have a voice in naming these new stations in the beautiful Skokie Valley, where, without doubt, within a very short time there will be a large population.

New Colors for Detroit Cars

A. L. Drum, engineer for the receivers of the Detroit United Railway, Detroit, Mich., has authorized a decided innovation in car coloring. The new Detroit United design is of stream-line effect and in the five principal colors. The body of the car is painted in desert sand color with mahogany sashes, old ivory posts, vermillion red roof and light gray trucks. Parts suspended under the car are in black and all trimming and striping are in black. In addition there is a 2-in. red band just below the window sashes. The Detroit United Lines' monogram appears on the sides of the car in azure blue with black border.

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Skip Stops Suggested for Baltimore

The Baltimore Traffic Commission has received a recommendation from Kelker, De Leuw & Company, Chicago, experts making a traffic survey of Baltimore, that a skip-stop plan of operating the street cars be put into effect during the busy hours of the morning and afternoon. The report to the commission states that the stopping places average 10.22 in every mile of track as compared with slightly more than eight in Washington and Chicago.

The report said that widening of streets, though expensive, will be necessary in many cases if the time spent between home and office, store or factory is not to be greatly increased in the future. It is pointed out that meanwhile the time consumed in traveling can be reduced for the majority of the workers if some of the stops are eliminated during the morning and evening rush hours.

The question of rerouting the street cars, four plans for which have been prepared by the experts and submitted to the commission and upon which public hearings will be held, is being discussed by civic bodies.

Bacharach Bill Up Again in Washington

It is said that strong efforts will be made to persuade the House judiciary committee to order public hearings on the bill of Representative Isaac Bacharach of the Second New Jersey District to prevent appeals to federal district courts from rulings of state utilities commissions.

This bill, in substantially the same form, has been before two previous Congresses, but hitherto all efforts to get it reported out of committee have failed. Despite this fact, Representative Bacharach has hopes of getting a public hearing similar to the four that were held by a sub-committee in the 67th Congress in 1922.

Members of the federal judiciary have complained of the practice of public utilities, without appealing, as is their right, to the highest courts of their own states, of seeking injunction in federal courts to restrain utilities commissions from enforcing their own orders. As the law now stands injunctions may be sought in federal courts, without going to the highest state courts.

Riggs Report for Toledo Approved

The City Council at Toledo, Ohio, has unanimously indorsed the report of Prof. H. E. Riggs as the basis for negotiations with Henry L. Doherty for changes in the Milner franchise and new operating plans at Toledo. A copy has been sent to Mr. Doherty.

Since the report has been published an effort is being made to arouse public sentiment to back any settlement that may be made through the negotiations.

Through the invitation of the Chamber of Commerce a mass meeting was addressed by Prof. Riggs in which he emphasized the need for co-operation among the business leaders to help city and company officials work out "a serious problem." He indicated that there were 5,250,000 riders a month on street cars and buses who must be served. He also pointed out that there was a franchise contract between the city and the traction company which should be carried out in order to keep the credit of the city good. He recommended that the grant be made flexible enough to serve the city and continue the contract through a co-ordinated street railway and bus system.

No Advance in Wages in Milwaukee Now

The request of employees of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for a new and higher wage scale has been disallowed following a series of conferences between officials of the company and the Employees' Mutual Benefit Association, which conducted the negotiations for the employees. Settlement of the issue was influenced to a large extent when it was agreed that wage and cost of living conditions in Milwaukee were more than on a par with similar conditions in other cities that correspond in population to Milwaukee. Under the terms of the agreement reached, employees will continue to work until June, 1926, at the scale in force during the latter part of 1925. Conductors and motormen numbering upward of 1,000 of all grades in Milwaukee, Racine and Kenosha requested an advance of 5 cents an hour over the present rate of 50 to 61 cents an hour.

Mayor and Commissioner Discuss New York Transit

Mayor Walker of New York talked on the subject of transit before members of the Rotary, Lions, Kiwanis, Optimists, Exchange and Civitan clubs, assembled at a joint dinner at the Pennsylvania Hotel on Jan. 18. Among other things he said:

> It is conferences of this kind that lead us out of the fog on this great question, a question that requires solution and requires it now. I have no fear of the political effect of taking counsel with you and I promise to take full advantage of any suggestions you may make.

Major-Gen. John F. O'Ryan, representing the State Transit Commissioner, said the question of transit was divided into two parts, one providing additional facilities and the other making better use of the facilities that now exist. Even should the Legislature grant a further exemption from the city's debt limit, this would take several years to become effective, so that the immediate problem was to make the best of present facilities.

To accomplish this he said the Transit Commission offered the plan for unified control, through a quasi-public corporation to be organized, of the more than forty existing transportation companies within the city. This plan, said General O'Ryan, received no consideration by the preceding city administration, but was the one plan that would eliminate waste and bring efficiency of operation. General O'Ryan suggested redistribution of the city's population, so that it would live nearer the places of employment.

Railway Cars Again Operate in London, Ont.

Service was resumed recently by the London Street Railway, London, Ont., the tie-up ending after seven days. The relief came as the result of intervention by a group of business men. The Council insisted that the railway resume service before negotiations went further.

Steps will be taken to arrange a 60 days operation period at a 5-cent fare in the hope that during this period a definite permanent agreement can be made with the company. It is understood that the buses which have been operated are to be withdrawn soon for service elsewhere and that licenses will not be issued by the Police Commission for any more buses during the period of renewed agreement with the street railway. Elimination of the independent bus companies was demanded by the railway as the condition on which it would continue operation.

Engineers to Discuss Tube—P. R. T. Stock Increase Approved

Engineers of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will discuss with Director Ehlers and his engineers the preliminaries which would lead to an agreement for the operation of the Broad Street subway. This was the substance of a statement issued by Mayor Kendrick of Philadelphia following a conference in the Mayor's office on Jan. 18. Thomas E. Mitten, chairman of the executive committee of the P. R. T.; Ralph T. Senter, vice-president in charge of engineering; City Transit Director Ehlers, Charles B. Hall, president of the Council, and City Solicitor Gaffney attended the conference. This was the first step taken by the city toward the negotiation of a contract with the Philadelphia Rapid Transit. Mr. Mitten said that "many decisions must be made by the city primarily, and the company secondarily, before the actual basis of a P. R. T. operating contract can be intelligently considered."

No Fare Advance in Pasadena

The California Railroad Commission has denied the application of the Pacific Electric Railway for an increase of its street railway and bus fares in the city of Pasadena. The commission finds that the permits for the bus line are held by the Pacific Electric Land Company and are entirely within the city. The commission held that the railway lines are making an adequate return under the conditions in that city.

Celebrates Car and Bus Service

Officials of the Portland Electric Power Company were guests at a jubilee dinner held at Pier 4 in the Peninsula district of Portland, Ore., celebrating the completion and opening on Jan. 1 of the new street car line and supplementary bus service to the St. John's region. This line was long pleaded for by residents of this region. About 400 prominent men in railway circles, city commissions, port representatives and community club boosters attended.

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Increases for Detroit Municipal Railway Officials

Increases in salary totaling $9,800 annually have been granted officials of the Department of Street Railways at Detroit, Mich., by the Street Railway Commission. The advances are retroactive to Dec. 15, 1925. Col. H. U. Wallace, general manager of the municipal railway, heads the list with an increase of $3,000, from $15,000 to $18,000 a year.

William M. Hauser, auditor, who joined the forces of the D. S. R. last April, received an annual increase of $2,500, making his present salary $8,500 a year. D. A. Smith, general superintendent, was increased from $6,000 to $7,000 a year. F. J. Denny, now assistant general manager, was advanced from $4,000 to $5,000 a year and W. R. Dunham, executive engineer, received a $1,000 increase, raising his salary from $7,500 to $8,500 a year. Other increases were: A. C. Colby, superintendent of equipment, $500, from $7,500 to $8,000; P. A. Kerwin from $7,500 to $7,800.

Mayor Smith announced that the record that the D. S. R. officials have made fully justifies the increases. He cited that the present management has put the lines on a basis so substantial that the city will not have to borrow a cent or sell a bond to meet all its railway obligations. More buses are to be added. They will be paid for out of earnings, the Mayor stated.

Pennsylvania Company Inserts New Ad

The Beaver Valley Traction Company, New Brighton, Pa., recently inserted the following advertisement in a daily paper. It ran in part:

Sunday morning seems to be the worst morning that our trainmen have for making change. Patrons seem to depend upon the street car conductors to "break" the bills so there will be "change" for the church collections. Why not give us the correct amount and put the bills in the collection?

Purchase Referendum May Be Deferred

Despite 8,300 valid signatures on the petitions requiring a referendum on the proposed purchase by the Seattle, Wash., City Council of the Seattle & Rainier Valley Railway for $1,200,000, the measure may not go on the ballot on March 9, but may have to be submitted to the people at a special election later. City Comptroller Harry W. Carroll has pointed out that the filing of the petitions closed Jan. 9, and that he cannot certify them to the Council until Jan. 29. Forty-five days must elapse after that before they can be decided at an election. However, proponents of the referendum are going to try to get it on the March 9 ballot.

Atlanta Interurban Increases Rates

Increases in passenger fares and express rates effective Feb. 1 on the Stone Mountain interurban line were granted to the Georgia Railway & Power Company by the Georgia Public Service Commission on Jan. 12. The new passenger rates are exactly as requested by the company in a petition filed some months ago and on which a public hearing was held Dec. 3. The increase in passenger fares ranges from 25 per cent to 40 per cent above the present rates for single-trip fares and averages 10 per cent on monthly commutation ticket books. Express rates granted are less than those asked by the company, but the minimum express charge of 35 cents is the same as requested by the company.

For a number of years the Stone Mountain interurban line has failed to make a reasonable return to the Georgia Railway & Power Company on the money invested in it. Granting of the new rates also makes it possible for the company to establish its proposed bus line from the terminus of the Stone Mountain line to the location at which the actual carving is being done on Stone Mountain. This will be a real advantage to sightseers wishing to view the memorial but unwilling to pay the high jitney prices now demanded.

Fare Rates in Joplin Explained

Following receipt of an order from the Missouri Public Service Commission officials of the Southwest Missouri Railroad and the Joplin & Pittsburg Railway have increased fares on street car and bus lines in Joplin, Mo. The order provides that the increased rates shall remain in effect for six months. At the end of that time the rates shall be lowered to their former standard unless the commission may grant continuance of the higher fares. The commission further specifies that the rates may be modified or reduced to their former figure by that body before the six months have elapsed. The present fare of 5 cents on the urban lines is increased to 8 cents for one fare or two for 15 cents. The commission's order further authorized interchangeable transfers between street cars and buses of the two lines for a continuous passage in one direction. Free transportation will be given children under five years old. Those between five and twelve years will be charged 5 cents and will be given a 2½-cent coupon good for another passage. The fare advance has been mentioned briefly in these pages.

News Notes

One-Man Car Complaint Withdrawn.—Hearing on the petition of E. C. Smith and others against the use of one-man cars in Atlanta, Ga., by the Georgia Railway & Power Company before the Georgia Public Service Commission was indefinitely postponed on Jan. 11 when the petitioners withdrew their complaint. It was stated, however, that the complaint was withdrawn to permit the petitioners to observe the cars in operation.

Seven-Cent Fare Continued.—The Public Service Commission on Jan. 15 authorized the Binghamton Railway, Binghamton, N. Y., to continue in effect the present 7-cent rate charged in Binghamton, the villages of Port Dickinson, Johnson City and Endicott and in the town of Union, Broome County. It is provided that the fare for a single ride between Johnson City and Endicott shall be 10 cents, with a fare of 15 cents for a round trip made on the same day.

Franchise in Little Rock Amended.—The City Council of Little Rock, Ark., recently passed an ordinance amending the franchise of the Arkansas Central Power Company which gives the company permission to construct and maintain "loops" at the terminals of several of its lines. The lines to be benefited by the improvement are the Rock Island, East Sixth Street, East Fourteenth, West Ninth, South Highland and Fifteenth Street lines in Little Rock. The "loops" are to be built on private property with shelters to protect waiting passengers. The franchise is to end Sept. 27, 1951, the date upon which the company's present franchise expires.

Transfer Charge Increased.—The Indianapolis Street Railway, Indianapolis, Ind., was authorized by the Public Service Commission to increase its transfer charge from 1 to 2 cents, effective Jan. 1. It is expected the boost will increase street car revenues $100,000 annually. The previous fare increase granted the company was offset by a decrease in customers.

Ten Cents in Belleville.—The East St. Louis & Suburban Railway, which operates the city railway and bus lines in Belleville, Ill., has announced that it will increase its fare in that city from 7 to 10 cents, effective on Jan. 24. The increase, according to the company's announcement, is made because returns under the 7-cent fare have not taken care of the operating expenses. The new rate is established under authority of a decree of the United States District Court. The 10-cent rate will apply to all trips on city lines and so far west on Main Street at Voellinger Station. The proposed increased fare was attacked recently by members of the Belleville City Council.

New Wage Scale in Effect.—Two hundred employees of the Illinois Traction System operating the line that connects Joliet, Princeton, Ottawa and Streator have accepted a new wage scale providing for an hourly pay ranging from 52 to 63½ cents, effective until Nov. 30, 1926. The former scale ranged from 49 to 60 cents. A wage settlement applying to the main line of the Illinois Traction was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 2, 1926, page 45.

Certificate for Line Between St. Louis and Kansas City Refused.—Refused a certificate of convenience and necessity for the construction of an electric railroad between St. Louis and Kansas City, Mo., the St. Louis & Kansas City Short Line Railroad has appealed to the Cole County Circuit Court from the ruling of the Public Service Commission. The commission denied the certificate largely on the grounds that the company had not made a showing sufficiently conclusive of financial ability to carry out the construction plans.

Files Higher Fare Application.—The New York State Railways has applied to the State Public Service Commission for permission to increase fares on its bus and trolley lines in Utica and Syracuse from 7 to 10 cents. Ten tickets

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would be sold for 75 cents under the proposed fare provision. The likelihood of the company's filing such an application was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 16, 1926, page 126. In its petition the company maintains that the valuation placed by the commission in previous rate cases on the Syracuse and Utica lines is too low. It also states that upon the commission's valuations, plus net additions, the railway lines have failed by a considerable amount to yield a fair return.

Foreign News

Norwegian City to Have Underground Railway.—Oslo, the capital of Norway, is going to construct an underground railway to extend from Majorstuen, a station on the Holmenkollen Railway in the suburbs of Oslo, to the center of the city. The tunnel, which it is expected will be completed within 2½ years, will carry the trains of the four lines handling the heaviest traffic from the surrounding districts to Oslo. Besides resulting in a great saving of time, the proposed tunnel will be of considerable relief in solving the traffic problems of Oslo.

Weekly Tickets on London Railway.—Weekly season tickets have been introduced by the London Electric Railway, London, England, on the Baker Street and Waterloo line. If this scheme proves popular, it will be extended further. Monthly and quarterly season tickets are already in effect.

Railless Development in England.—Trackless trolleys are being adopted in England in place of worn-out tramways on certain routes where traffic is not very heavy. The Nottingham Tramways Committee has decided to substitute the railless system for tramways on a route 2½ miles long. The Town Council is authorized to run trackless cars up to a weight of 10 tons. This will allow the use of double-deck vehicles seating 56 passengers. Ipswich Town Council, which recently decided to convert all the tramways in the borough to the trackless system, has ordered 30 trolley buses at a cost of more than £41,000.

English Railway Extensions.—Liverpool City Council has confirmed a proposal to borrow £87,000 for the construction of additional tramways. Manchester City Council is about to proceed with an extension of tramway routes which will cost approximately £75,000.

Railway in Uruguay Plans to Electrify. — Partial electrification of the Northern Railway from Montevideo to Santiago Vazquez, Uruguay, a distance of 19.5 km., is now under consideration by the management of the state railways and street cars in Uruguay. La Transatlantica, a German street car system of Montevideo, and the railway management are negotiating an arrangement whereby the street car company will operate over the tracks of the Northern Railway instead of building a new and competitive line.

Recent Bus Developments

Co-ordination Plans of the New Haven

Edward G. Buckland, vice-president of the New York, New Haven & Hartford Railroad, which controls the Connecticut Company, operating electric railways and buses in Connecticut, has announced that the corporation will soon issue interchangeable tickets, good for transportation on its steam railroad, its bus lines or, if passengers desire it, on the electric railway system, and that a change in the railroad's schedule is being worked out so that train and bus service might be co-ordinated.

A statement made also announced fourteen bus line routes to be operated as auxiliaries of the steam line in Connecticut, Rhode Island and Massachusetts. Mr. Buckland said that the prices of bus line tickets would be the same as for trains. Mr. Buckland said:

> If a traveler should purchase a ticket in New York for New Haven or any other town on the main line he is entitled to be transported to his destination as rapidly as he wishes to go either by rail or by omnibus, and at the same rate of fare. The books of the New Haven system show that, in some cases, our branch line rail service costs us $1.25 per mile, while our revenue on the same line is only 35 cents a mile.
>
> The institution of buses may not increase our gross revenue because our rates of fare will be the same as before, but it will cut down our expenses and will greatly increase our net income. The adoption of the bus system by the New Haven Railroad will provide better service than has been recently possible by train without increase of cost.

The fourteen lines on which buses will be operated were announced as follows:

Danbury and South Norwalk, Hartford and Suffield, Willimantic and Woonsocket, Willimantic and North Grosvenordale, New Haven to Hartford, Hartford to Broadbrook, Willimantic to Norwich, New London to Norwich, Fall River to Taunton, Fitchburg to Worcester, Providence to Plainville, Providence to Bristol, R. I., Providence to Worcester and Canton Junction to Stoughton, Mass.

On the date that the bus service goes into effect, it was said, extensive revisions of the New Haven's train schedule will be announced.

Bus Lines to Carry Passengers Into Center of Baltimore

Acting in the case of William E. Conway, who operates a passenger bus line from Emmittsburg, Md., to Baltimore, the Maryland Public Service Commission has granted permission for the transportation of passengers to the center of the city. The order was passed upon the application of Mr. Conway. Heretofore the line has been required to discharge passengers at Reisterstown, where they boarded cars of the United Railways & Electric Company for the trip to Baltimore.

It is explained that each case in which the right is sought to run into Baltimore will be decided upon its merits and that the action on the Conway application does not mean that any line now discharging passengers outside the city where they connect with the street cars will be permitted to continue into the center of the city without the permission of the commission. So far the Conway case is the only one in which action of this kind has been taken. The lines operating to Washington and some other larger places have been permitted to carry their passengers into the center of the city ever since they were started.

The order handed down in the Conway case contains a clause which prohibits the line from transporting passengers between Baltimore and Reisterstown or intermediate points, as this territory is served by the railway. Passengers originating beyond Reisterstown, however, will be conveyed into the center of Baltimore.

Bus Service a Boon to Philadelphia Waterfront

Another important step has been taken by the Philadelphia Rapid Transit Company, Philadelphia, Pa., in its program of co-operation with the various interests of the community which it serves by establishing the Delaware Avenue bus route Q. Transportation has been made available to the workers along the waterfront district of Philadelphia. The route begins at Delaware and Oregon Avenues and operates along Delaware Avenue to Dyott Street, to Norris Street, to Richmond Street, to Delaware Avenue and thus returns to its point of origin.

Route Q will furnish service to maritime establishments as far south as Oregon Avenue, where the Philadelphia tidewater terminal docks are located, and as far north as Cramp's shipyards. The rapid growth of the dock district in Philadelphia, bringing this city to the fore as one of the principal ports of the United States, created a demand for speedier transportation between piers. Within the past two years two groups of piers have been constructed by the city—one the Southwark group, costing $3,000,000, and the other the Moyamensing group at McKean Street, costing $9,000,000.

Prior to the operation of this new bus route, there was no direct passenger transportation between piers. It was not desirable, nor was it practicable, to establish trolley service on Delaware Avenue. Traffic congestion made bus operation the only practical solution to the problem. Standard 33-passenger single-deck gas-electric motor buses are being used. The fare is 10 cents with 3-cent exchanges to all connecting car lines. In addition, the exchange privilege is extended to and from the elevated line at South Street station to the Oregon Avenue trackless trolley line.

The new service is appreciated by shipping officials. This is indicated by favorable comment received by the rail-

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way from many representative men, among them B. Hoff Knight of the Philadelphia Ocean Traffic Bureau and George F. Sproule, director of wharves and shipping. Mr. Sproule said:

The establishment by the P.R.T. of a bus service along Delaware Avenue will be a great boon to the port of Philadelphia. When the city undertook its program of building up the lowest section of the waterfront by the construction of huge water terminals there was much opposition, as it was generally felt that the inaccessibility of this locality and the difficulties to be encountered in getting labor would render such improvement useless. The bus service on Delaware Avenue has solved this problem.

Competition Brings Lower Fares in St. Louis

Commuters between St. Charles and Wellston, Mo., are enjoying the benefits of reduced fares which are the result of keen competition between the United Railways and the Creve Cœur Drayage & Motor Bus Company operating between the towns into St. Louis.

Last May the bus company started several buses on the St. Charles Rock Road between Wellston and St. Charles, charging 60 cents for the round trip. The United Railways shortly after this cut the street car fare to 50 cents for the round trip to persons who did not buy commutation books. In August the railway installed a fleet of buses to be run on express service between Wellston and St. Charles for a round-trip fare of 70 cents. This service saved time over that of the competing buses. On Dec. 10 the railway put into effect a holiday fare of 42 cents for the round trip. The bus company promptly met this cut rate by reducing its own charges to 40 cents for the round trip and those rates are now in effect. The United Railways has since announced that the holiday rate will be continued indefinitely.

New Service Started.—The Seattle Municipal Railway, Seattle, Wash., started on Christmas Day, 1925, a municipal bus service on Empire Way on a 30-minute schedule.

Buses to Expedite Service.—The Connecticut Company has petitioned the Public Utilities Commission for authority to abandon its Oak Street line in Bridgeport from North Avenue to James Street. A bus line will be operated to supply the needed service and in rush hours a trolley will be used for part of the trip as well as the regular buses.

Would Enlarge Bus Service.—The Lordship Railway, which holds a franchise to operate a trolley line from Hard's Corner, Stratford, Conn., to Lordship Park in Bridgeport, has petitioned the Public Utilities Commission for authority to operate buses over Garfield Avenue to South Main Street at Birdseye Street. This line would provide transportation for the people between the Avon section of Stratford and Bridgeport. If the authority is granted the company will start buses on a schedule allowing a one-hour headway. Some time ago the Lordship company abandoned the trolley line between Hollister Street at Stratford Avenue and Lordship and substituted buses. The new territory over which the company would operate another bus line is included in the franchise given the company years ago.

Would Operate Bus With Railway.—The Key System Transit Company has applied to the Railroad Commission for permission to operate a bus service in connection with its Leona Heights car line between the end of that car line at the intersection of Calaveras and Woodland Avenues in the city of Oakland, Cal., to Anderson Street. It is proposed to charge a fare of 7 cents per passenger with transfer privileges.

Buses in Walla Walla.—Operation of railway cars in Walla Walla, Wash., by the Walla Walla Valley Railway has been eliminated entirely. On Jan. 1, three buses owned by the Walla Walla Transit Company started on schedules covering the larger portion of the city, heretofore served by the railway. All street car tracks, except the interurban line, which runs to Milton, Ore., will be removed in the immediate future.

Bus Service in New Jersey Increased.—Application was made recently by the Public Service Railway to operate a crosstown bus line on High Street, Newark, N. J. The proposed route would connect radial trolley lines serving the northwestern and southwestern sections of the city. No public transportation facilities have ever existed on High Street, which is four blocks west of the principal railway lines and two blocks west of another railway route. It is proposed to operate four buses.

Wants to Operate Between East St. Louis and Alton.—The Alton, Granite & St. Louis Traction Company on Jan. 4 applied to the Illinois Commerce Commission for a certificate of convenience and necessity to operate a bus line from East St. Louis to Alton, Ill., via National City, Brooklyn, Venice, Madison, Granite City, Nameoki, Mitchell, Hartford, Woodriver and East Alton.

Garage Service in Akron Popular.—Success is attending the operation by the Northern Ohio Traction & Light Company of a garage in connection with its terminal station at Akron, Ohio. Here automobiles are checked for 25 cents by persons who wish to continue their journey by interurban to Cleveland, Canton or other cities in which the company operates. A uniformed attendant checks the car, removes the baggage and brings the car to the patron upon his return to the terminal. During last year the company added 59 buses to its equipment and now operates a total of 164 buses.

Service Extended in Springfield.—A. D. Mackie, general manager of the Illinois Power Company, Springfield, Ill., has announced extension of the Springfield bus lines to include another route. This service will be designated as the North Third Street and Sangamon Avenue line. It will be the fifth bus route since the city granted the traction company the privilege of utilizing buses in city transportation.

Buses Will Supplant Part of Line.—The franchise covering part of its feeder lines expires March 1, but this will not be renewed by the Colorado Springs & Interurban Railway, Colorado Springs, Col. Buses will supplant that part of the street car system which is to be abolished. The rights for the main tramway line through the downtown part of the city has many years to run. That part of the system will undergo no changes. The part to be abandoned takes in Nob Hill, a residential, educational and hospital section. The situation in Colorado Springs was the subject of a three-page article in the ELECTRIC RAILWAY JOURNAL for June 6, 1925, page 885.

Buses in Hourly Service.—Operation of a bus line between Olean, N. Y., and Bradford, Pa., by the Olean, Bradford & Salamanca Bus Lines, Inc., a subsidiary of the Olean, Bradford & Salamanca Railway, opened on Jan. 7. Two 22-passenger Fageol coaches have been purchased. Hourly service between the two cities is maintained from 8 a.m. to 5 p.m. This company operates buses between Kane and Smethport, Pa. It contemplates supplanting its trolley service between Olean and the village of Bolivar with a bus route.

Additional Service in Aurora.—The Chicago & Joliet Transportation Company, subsidiary of the Chicago & Joliet Electric Railway, has been granted permission to operate two new bus lines in Aurora, Ill. The routes will be arranged to provide for peak service.

New Route Started.—The Blue Goose Bus Line, subsidiary of the East St. Louis & Suburban Railway, running between St. Louis, Mo., and Belleville, Ill., began using on Jan. 1 the Eads Bridge instead of the Municipal Bridge to enter St. Louis. The bus fare between the two cities at the same time was increased to 45 cents for the first zone, 40 cents for the second zone and 35 cents for the third, a raise of 10 cents, but transfers to all the Belleville Street cars will be furnished at the new rates.

Would Run Bus Instead of Trolley.—The Ontario Motor Lines, subsidiary of the New York State Railways, has applied to the Council of Canandaigua, N. Y., for the right to operate a bus line in the city in place of the present street car service. The company proposes to serve a wider territory by the buses than is now taken in by the single trolley line.

Bus Growth in 1925.—The St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., during 1925 carried 2,607,115 passengers on buses which traveled 814,807 bus-miles. At the beginning of the year the company was operating only four buses on a single line, the Natural Bridge Avenue route feeding into the Union Boulevard and Natural Bridge divisions of the United Railways. On Dec. 31, 1925, the company had six lines and was using 35 buses of the 29-passenger single-deck pay-as-you-enter street car type. During December, the largest month for the company, its buses carried 316,269 passengers and traveled 96,633 bus-miles.

New Routes Authorized.—The Boston Elevated Railway, Boston, Mass., has been authorized by the Public Utilities Commission to operate three auto bus routes as follows: A route from Copley Square to South Station, which was planned to avoid congestion, a second route from Andrew Square to Old Colony Avenue and a third from the Boylston and Ipswich Street loop extension to connect with the present Fenway-Bowdoin Square bus line.

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Financial and Corporate

$5,000,000 Increase in Capital in Philadelphia Approved

The City Council of Philadelphia, Pa., on Jan. 14 approved by a vote of 16 to 4 an increase of $5,000,000 in the capital stock of the Philadelphia Rapid Transit Company. Of this amount $3,000,000 will be expended in the purchase of the Yellow Cab Company, and the remaining $2,000,000 will be spent for garages and other additions to the service.

A supplementary ordinance also was passed on Jan. 14 providing for the merging of taxicab income with the earnings from other units of the P. R. T. system in order that the city may share in the surplus, as provided in the city-company agreement of 1907, and to allow a common basis for rate fixing.

The option of the P. R. T. on the taxicabs has been extended and it is not known just when the purchase will be consummated.

Earnings at Rochester Slightly Behind

The report of Charles R. Barnes, commissioner of railways at Rochester, N. Y., for the quarter ended Oct. 31 shows that the New York State Railways, Rochester lines, failed by $41,544 to meet the return guaranteed under the service-at-cost contract. The deficit from railway operations was $34,265 and from buses $7,279. The total revenue from all railway operations for the three months was $1,189,883, with total operating expenses of $841,290. Trolleys carried a total of 22,962,024, including transfers, during the period; trackless trolleys transported 376,631 and buses 57,922, a grand total of 23,387,577 passengers. The results are tabulated in the accompanying summary.

Small Loss in Oklahoma City—Buses Do Well

Financial statement of the Oklahoma Railway, Oklahoma City, Okla., now in the hands of the receivers, is expected to show a deficit of $20,000 for the year 1925. The year started off well, but there was a marked decrease in receipts during the summer months. September showed an increase, which continued through the months of October and November. Stockholders of the company have hopes for a brighter year in 1926. Bus operation, utilized to supplement railway service in Oklahoma City, has proved profitable. The company now has three bus lines in Oklahoma City, all of them doing a good business. Three new Reo buses were delivered to the company last week and immediately put in service on arrival, though without the customary several coats of paint. There was an immediate demand for these buses and the company could not wait for them to be painted at the factory. They will be painted in the shops of the company here. There will be further expansion in the bus lines of the company in the near future, but no definite plans have yet been announced by the receivers. The annual meeting is set for Jan. 26.

Decision Setting Aside Rates Regarded Important

In a federal court decision handed down at Madison, Wis., by Judge Claude S. Luce the Oconto City Water Company won its fight to set aside rates fixed by the Railroad Commission, which were considered so low as to be confiscatory. The decision is the outgrowth of an appeal. It grants the water company a rate higher than the one fixed by the commission. A point in the decision regarded of far-reaching significance is the fact that the views expressed would seem to cast doubt on the validity of the theory on which the Wisconsin commission has valued public utility property in the state. The federal ruling has been interpreted to indicate the need for rates based on present reproduction costs rather than average prices taken over a period of years, which basis the commission follows.

Aurora, Elgin & Fox River Included in Western United

A syndicate headed by E. H. Rollins & Sons, with Blair & Company, Inc., Harris, Forbes & Company, Halsey, Stuart & Company, Inc., Marshall Field, Glore, Ward & Company, Spencer Trask & Company, the Illinois Merchants Trust Company and the First Trust & Savings Bank, Chicago, offers a new issue of $22,500,000 Western United Gas & Electric Company first mortgage 5½ per cent bonds, due Dec. 1, 1955, at 99 and interest, to yield about 5.55 per cent. The bonds are issued as a result of the consolidation of numerous properties, the securities of which are to be retired, and the new issue will be a first mortgage on all the properties.

The bonds will be secured by direct

OPERATING RESULTS IN ROCHESTER FROM AUG. 1, 1925, TO OCT. 31, 1925, INCLUSIVE

		Cents per Car-Mile	Dollars per Car-Hour
Railways: Miles of road operated	78.81		
Car-miles	2,402,298		
Car-hours	275,332		
Revenues from railway transportation:			
Passenger revenues	$1,164,325		
Chartered car revenues	707		
Mail revenues	17		
Miscellaneous transportation revenues	467		
Total revenue from railway transportation	$1,165,518	48.51	4.23
Revenues from railway transportation:			
Station and car privileges	$13,160		
Rent from tracks and facilities	7,471		
Rent from buildings and other property	3,734		
Total revenue from other railway operations	$24,365	1.02	.09
Total revenue from all railway operations	$1,189,883	49.53	4.32
Railway operating expenses:			
Maintenance of way and structures	$120,089	5.00	.44
Maintenance of equipment	85,742	3.57	.31
Power	62,835	2.62	.23
Conducting transportation	412,776	17.18	1.50
Traffic expenses	3,096	.13	.01
General and miscellaneous expenses	111,749	4.65	.40
Renewals and depreciation	45,000	1.87	.16
Total railway operating expenses	$841,290	35.02	3.05
Net revenue from railway operations	$348,593	14.51	1.27
Auxiliary operations:			
Revenues	$907	.04	.00
Expenses	1,188	.05	.00
Auxiliary operating deficit	$280	.01	.00
Net railway and auxiliary operating revenue	$348,312	14.50	1.27
Taxes assignable to railway operations	90,754	3.78	.33
Railway operating income	9	.00	.00
Non-operating income	9	.00	.00
Railway gross income	$257,567	10.72	.94
Bus lines operating deficit	5,012		
Service-at-cost gross income	$252,555		
Return on investment, railway property	$291,832	12.15	1.06
Return on investment, bus lines	2,267		
Total return on investment	$294,100		
Service-at-cost operating deficit	$41,544		

SUMMARY OF OPERATION OF CO-ORDINATED BUS LINES, UNDER SERVICE-AT-COST CONTRACT AUG. 1, 1925, TO OCT. 31, 1925, INCLUSIVE

	Gasoline Buses	Trackless Trolley Buses
Bus-miles	20,636	55,645
Bus-hours	2,325	7,647

	Gasoline Buses			Tr'kl's Trolley Buses		
Operating revenues:		Cents per Mile	Dollars per Hour		Cents per Mile	Dollars per Hour
Passenger revenues	$3,011	14.59	1.28	$12,731	22.28	1.67
Operating expenses:						
Maintenance of way and structures	1	.01	.00	910	1.64	.12
Maintenance of buses	2,606	12.63	1.11	4,040	7.26	.53
Gasoline and power	714	3.46	.30	1,290	2.32	.17
Conducting transportation	2,572	12.47	1.09	5,561	10.18	.74
General and miscellaneous	737	3.57	.32	1,972	3.55	.26
Total operating expenses	6,532	32.14	2.82	13,875	24.95	1.82
Net operating deficit	3,621	17.55	1.54	1,144	2.07	.15
Taxes	94	.45	.04	152	.28	.02
Total operating deficit	3,715	18.00	1.58	1,296	2.35	.17
Return on investment	380	1.85	.16	1,887	3.39	.25
Deficit applicable to service-at-cost	4,095	19.85	1.74	3,183	5.74	.42
Operating deficit; both lines	5,012					
Return on investment	2,267					
Bus lines deficit applicable to service-at-cost	7,297					

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first mortgage on all properties owned by the company in fee, and by pledge and deposit of all of the capital stock and funded debt of the Coal Products Manufacturing Company and of the Aurora, Elgin & Fox River Electric Company, which owns the electric railway properties. The company serves a rapidly developing territory west of and contiguous to Chicago and the reproduction cost of the mortgaged property is estimated at $40,000,000.

Fitkin Interests Get Shannahan-Peck Property

Acquisition by Fitkin Utilities, Inc., of the Newport News & Hampton Railway, Gas & Electric Company of Virginia, of which J. N. Shannahan is president, was announced on Jan. 20. The Fitkin interests have acquired 80 per cent of the preferred and common stocks of the Newport News property at a price understood to have been $110 a share. The property will be combined with the Virginia-Western Power Company, Virginia-Northern Power Company and other Virginia holdings in a subsidiary of the National Public Service Corporation, the Fitkin utility holding company.

Efforts made to locate Mr. Shannahan so as to get a statement from him were unavailing, but at the office of Fitkin & Company it was said that as the deal had only just been concluded the question of any possible change in personnel had not even been considered, but that Mr. Shannahan would undoubtedly continue as a director, if not an officer, under Fitkin control.

Successor Company in Danbury Seeks Approval of Plans

The Danbury & Bethel Traction Company, Danbury, Conn., will succeed the Danbury & Bethel Street Railway under reorganization. A request has been filed with the Public Utilities Commission for approval of the reorganization plans. The Danbury & Bethel Traction Company plans to reconstruct the lines with the proceeds of a new bond issue. At the hearing on Jan. 5 the commission was asked to approve $500,000 of first mortgage gold bonds and $300,000 of 6 per cent preferred stock and an issue of 3,000 shares of common of no par value.

More P.R.T. Stock for Car Riders

If any one in Philadelphia was unaware on the evening of Thursday, Jan. 21, that the Philadelphia Rapid Transit Company had that day undertaken another large drive for the sale of preferred stock to car riders, it certainly came about through no lack of publicity effort on the part of the company. Every car and bus in service was placarded inside and out with investment slogans, the newspapers were accorded full-page advertisements on the subject and thousands of "Read-as-You-Ride" *Service Talks* were distributed by mail and by employees' committees telling of this additional issue of stock.

Reports from the various sales headquarters indicate that the present issue will be floated in even more rapid fashion than that made in February, when $3,000,000 was oversubscribed in six days.

Stockholders of the company voted unanimously on Jan. 20 to approve the issue of an additional $15,000,000 of preferred stock, carrying dividends of 7 per cent. It is understood, however, that only a portion of this will be sold at the present time. An additional block may later be offered to finance the purchase of the taxis by the P.R.T., according to a report appearing in the Philadelphia *Record*. No more than twenty shares of stock may be subscribed by any individual and any subscription may either be paid for outright or on a plan of deferred payments, $1 per share per week being payable to any conductor or subway-elevated cashier.

As stated in *Service Talks*, the funds resulting from the present issue will be used in carrying out several comprehensive extension programs. They are:

Making ordinary extensions and improvements to the transit system.

Building track extensions to serve the Sesqui-Centennial Exposition and encourage the building of homes in South Philadelphia.

Building and improving motor bus garages, carhouses and power stations.

Purchasing and rehabilitating the Frankford, Tacony & Holmesburg Railway.

Retiring certain senior securities.

Replacing in P. R. T. treasury moneys temporarily taken from P. R. T. reserves for improvements and extensions.

The present issue is also open to subscription by employees of the company on the same deferred payment plan, with the exception that the payments will be deducted by the company from the weekly pay envelopes. No interest is to be charged to subscribers making use of the deferred plan, so that the shares cost them no more than would be the case under a plan of outright purchase.

Dayton-Union City Line Out of Existence

After service of 25 years, the Dayton-Union City branch of the Indiana, Columbus & Eastern Traction Company lines passed out of existence on Dec. 31, authority having been granted by the Ohio Utilities Commission to abolish the division. Company officials said it had not been paying for several months. As was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 19, 1925, page 1091, bus substitution is planned.

The line was organized in 1901 by Dr. J. E. Lowes, Joseph Feight and H. J. Kiefaber, all of Dayton, to operate between Dayton and Greenville. It was the first interurban in Ohio to operate over its own right-of-way, and also the first to introduce regular freight service. In 1904 the line was extended to Union City and a year later through to Muncie, Ind. A few years ago it became a part of the former Ohio Electric Railway. The line was 55 miles long. Much of the real estate of the right-of-way reverts to the original owners.

Surplus in December in Toledo

A surplus of $2,290 was earned in December, 1925, by the Community Traction Company, Toledo, after providing for all expenses, funds and dividends. This is the first surplus since March, 1925. Gross revenue was $328,993, compared with $340,761 for the similar month last year. The lines carried 4,417,488 revenue passengers, compared with 4,491,372 for December, 1924. There was an increase in car mileage operated. Operating expenses were $227,697, a ratio of 69.21 per cent of total revenue.

The total deficit for 1925 was $108,211. This is offset by a corresponding decrease in rent of tracks and terminals. Maintenance funds were decreased from $770,000 in 1924 to $680,000 in 1925. Expenditures, however, increased. Oper-

Conspectus of Indexes for January 1926

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Jan. 1926 **7.32**	Dec. 1925 **7.30**	Jan. 1925 **7.25**	Jan. 1926 **7.32**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Jan. 1926 **154.3**	Dec. 1925 **153.9**	Jan. 1925 **150.3**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	Jan. 1926 **223.8**	Dec. 1925 **223.0**	Jan. 1925 **221.0**	Sept. 1920 **232.0**	May 1923 **205.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Jan. 1926 **202.2**	Dec. 1925 **202.2**	Jan. 1925 **205.3**	July 1920 **256 4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Jan. 1926 **207.2**	Dec. 1925 **206.0**	Jan. 1925 **210.4**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Dec. 1925 **156.2**	Nov. 1925 **157.7**	Dec. 1924 **157.0**	May 1920 **246.7**	Jan. 1922 **138.3**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Bradstreet Wholesale Commodities 1913 = 9.21	Jan. 1 1926 **14.01**	Dec. 1 1925 **14.41**	Jan. 1 1925 **13.93**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Dec. 1925 **165.5**	Nov. 1925 **167.1**	Dec. 1924 **151.5**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Dec. 1925 **171.4**	Nov.† 1925 **171.1**	Dec. 1924 **166.1**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Dec. 31 1925 **5.033**	Nov. 30 1925 **4.582**	Dec. 31 1924 **4.817**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	Dec. 1925 **20.01**	Nov. 1925 **18.35**	Dec. 1924 **18.45**	Oct. 1925 **20.30**	Feb. 1922 **10.65**
Business Failures Number Liabilities (Millions)	Dec. 1925 **1627** **43.08**	Nov. 1925 **1462** **42.78**	Dec. 1924 **1911** **57.77**	Jan. 1924 **2231** **122.95**	Aug. 1925 **1353** **27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 144 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. †Not including fuel (171.8 with fuel).

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ation for 1925 covered 6,727,174 car-miles, compared with 7,108,643 car-miles in 1924.

Power Company Takes Over Railroad's Electric Customers

The Cleveland Electric Illuminating Company, Cleveland, Ohio, a subsidiary of the North American Company, has purchased the Cleveland, Painesville & Eastern Railroad. Included in the purchase are the electric light and power properties, but not the railroad properties of the United Light & Power Company, a subsidiary of the purchased company. Announcement of the price was withheld pending approval by the Ohio Public Utilities Commission. The acquired properties serve about 7,000 consumers, whose requirements are about 14,000,000 kw.-hr. annually.

Suburban Line Would Dismantle Road.—The Chicago & Interurban Traction Company, Chicago, Ill., has filed a petition with the Illinois Commerce Commission for permission to dismantle this 50-mile electric railway between Chicago and Kankakee.

Warrant Basis in Seattle.—In order to raise money to meet a payment on March 1, 1926, on the $15,000,000 bond issue for the purchase of the Seattle Municipal Railway system, Seattle, Wash., from the Puget Sound Power & Light Company, the railway department has gone on a warrant basis. The department must have the March payment, $833,000, which will be the fifth of the issue, ready by Feb. 1, 1926, and it must be in the hands of the city's fiscal agency in New York by Feb. 16. A total of $3,322,000 has been paid on the $15,000,000 debt so far.

Court Names New Receiver. — The resignations of W. H. Sawyer and Fred E. Allen as receivers for the Alton, Granite & St. Louis Traction Company have been accepted by Federal Judge English in East St. Louis, Ill. Both had served as receivers for the company since Dec. 20, 1921. Pressure of other business was responsible for their resignations. Mr. Sawyer, it will be recalled, is planning to go to Australia on a mission for the Australian government. Following the acceptance by Judge English, he appointed T. W. Gregory, secretary-treasurer of the East St. Louis & Suburban Railway, receiver for the Alton, Granite & St. Louis Traction Company.

Injunction Against Sale of Suburban Road.—The sale of the old Frankford, Tacony & Holmesburg Street Railway to the Philadelphia Rapid Transit Company, Philadelphia, Pa., has been enjoined by Common Pleas Court No. 2. President Judge Horace Stern handed down an opinion in the injunction suit brought by minority bondholders of the Frankford, Tacony & Holmesburg against the bondholders' protective committee, which bought in the property and franchise of the old road at the receiver's sale, and then formed the Northeastern Philadelphia Transit Company. The decision of the court is intended to restrain it from reselling the franchise and property to Edward J. Ryan, as agent of the Philadelphia Rapid Transit Company. The franchises and property of the old Holmesburg road were bought in by the bondholders' protective committee for $350,000, and it proposed to sell the same to the P. R. T. interests for $300,000. The complainants alleged this sum was inadequate. Furthermore, they disputed the authority of the committee to consummate the sale of the property under the terms proposed.

December Surplus in Philadelphia $133,658.—The operating revenue of the Philadelphia Rapid Transit System, Philadelphia, Pa., for the month of December was $4,608,309, with "operation and taxes" $3,500,409. The surplus for the month amounted to $133,658. There was a total passenger revenue of $4,545,577, of which $4,402,197 was from surface, subway and elevated and $143,380 derived from bus passengers. The number of passengers carried totaled 83,416,897. Of this number 81,862,870 traveled on the surface lines, subway and "L" and 1,554,027 passengers were carried by the bus lines.

Applies to Issue Bonds.—The Key System Transit Company, Oakland, Cal., has applied to the Railroad Commission for authority to issue and sell $2,500,000 of first mortgage 5½ per cent gold bonds, series C, and to use the proceeds derived from the sale to finance capital expenditures.

Temporary Discontinuance Allowed.—Permission was granted by the Public Service Commission on Jan. 15 to the New York State Railways, Utica lines, to discontinue trolley service on the James-Oneida and the Auburn Avenue shuttle lines until July 1, 1926, at which time the company will be required to restore the service or else proceed under the law to abandon the lines. The company started buses last October as an experiment along Oneida Street serving a considerable portion of the territory formerly supplied by the two shuttle lines. The bus service is so well patronized that the company will increase it as soon as additional buses, which have already been ordered, can be delivered.

Book Review

Super-Power—Its Genesis and Future

By W. S. Murray. Published by McGraw-Hill Book Company, New York, N. Y. 1925. 237 pages. Price $3.

Perhaps the contribution in this book of greatest interest to ELECTRIC RAILWAY JOURNAL readers is the suggestion by W. S. Murray that the mercury-arc rectifier may be the golden key that will unlock the dissensions of the past and make possible the long-looked-for expansion of heavy traction electrification.

Mr. Murray regards the tremendous growth of the 60-cycle power systems in the country as an important factor in the decision of the type of system to be used today. The author is careful to suggest the "consideration" of the rectifier in future systems, but does not recommend its "use" because at the present moment the rectifier is new in this country and has not yet been subjected to the test of time.

Not 5 per cent difference in annual costs exists among the modern types of systems recently installed. This statement is sustained by the author by the analysis outlined in the long chapter on railroad electrification.

The question "Why has there not been more electrification?" is answered thus by the author:

1. The credit of the steam railroads has been limited for many years.

2. There has been a certain amount of prejudice against electrification on the part of railroad managements long trained in the art of steam operation.

3. The large electrical manufacturers of the country have themselves been unable to agree on any one system.

The author says he shares in the blame for the never-ended battle of the systems.

The book starts off with a chapter on power, in which the author shows the relative effect of power in the development of the extensive industrial life of the United States. It is stated that 3 hp. is the average amount of mechanical power back of every industrial worker in the United States. This is twice as much power as is available for industrial workers in any other country.

Following the discussion of power, Mr. Murray devotes a chapter to the birth of electric utilities and two chapters to the ownership of utilities. These are replete with excerpts from reports from foreign countries and other data that contribute a distinct note to the material available on the relative merits of government versus private ownership.

Formation of the super-power survey, started in 1918, is well set forth. With the aid of E. G. Buckland, vice-president of the New York, New Haven & Hartford Railroad; Franklin K. Lane, Secretary of the Interior, and Dr. George Otis Smith, director of the U. S. Geological Survey, Congress on July 1, 1920, finally authorized the survey to be made. The report was finished within the allotted time of one year, and without over-running the appropriation of $125,000 made to complete the study.

Under the entrancing title Super-Power, Mr. Murray has succeeded in creating a word picture of electric power with its great possibilities that should interest the thousands of people who in their daily life have contact with the generation or use of electricity. In fact, the author has dealt with a truly large subject in a masterly way. Ideas expressed by him in the survey may not meet with the entire approval of the industry, but his portrayal of the future is an inspiration. The volume is concluded with the remark used many times before by the author, apropos of the World War: "We have spent millions for destruction, for preservation; now let us spend millions for construction, for conservation."

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Personal Items

A. W. McLimont President

Former Vice-President and General Manager Heads the Winnipeg Electric Company

A. W. McLimont was elected president of the Winnipeg Electric Company, Winnipeg, Man., and its subsidiaries on Jan. 4. He succeeds G. W. Allan as president. W. R. Bawlf, president of the N. Bawlf Grain Company, Winnipeg, was elected vice-president to succeed Mr. McLimont in that office.

By virtue of his extended experience in the public utility field, both in North and South America, and his active connection with the affairs of the Winnipeg Electric during the past eight years, Mr. McLimont is well qualified for his new position. He belongs to

A. W. McLimont

that school of public utility operators which recognizes an equal partnership and responsibility among the public, the public utility company and the utility's employees. The interests of all, he holds, are interdependent and must be mutually recognized if any measure of success is to be obtained.

One of his outstanding personal characteristics as a public utility operator is his deep and unshaken faith in the "fairness of the public." He has always believed that any public utility should lay all its cards on the table, take the public into its confidence and give it the facts concerning that utility's problems as they arise. Mr. McLimont has developed this policy, and as a result the public of Winnipeg is better informed about its street railway and the problems confronting it than is the public in most other cities.

The inherent spirit of "square dealing and fair play" in the man has marked his relations with his employees, with whom he has dealt on a broad basis and with sympathetic understanding.

While adhering to his determination to give the public a full measure of service for the price it pays, he has exercised close personal control of the company's operations and has made the Winnipeg street railway one of the most efficiently operated systems in Canada and the United States.

By his new appointment, patrons of the various services rendered by the Winnipeg Electric Company, which operates the local electric railway, are assured of a continuance of that policy which has been in evidence for some time now—a policy designed to give "the best possible service at the lowest possible cost," in the attainment of which the interests of the public, employees, and company are developed in an atmosphere of mutual good will.

Born in Quebec City, Mr. McLimont got his first glimpse of Winnipeg in 1885, when he came West as a member of the expeditionary forces raised at the time of the rebellion. From that time on his life has been spent in public utility work in all its phases. Among the important executive positions he has held might be mentioned—general manager of the Dubuque Light & Traction Company, Dubuque, Iowa; transportation engineer of the Public Service Commission for the First District of New York, vice-president of the Chicago & Milwaukee Electric Railway, vice-president and general manager of the Michigan United Railways, vice-president and general manager of San Francisco-Oakland Terminal Railways, now the Key System Transit Company; and vice-president and general manager of the Georgia Power Company.

W. H. Carter, president of the Carter-Halls-Aldinger Company, Ltd., Winnipeg; N. J. Breen, Western general manager of the Lake of the Woods Milling Company, Winnipeg, and James B. Woodyatt, president of the Southern Canada Power Company, Montreal, have been elected directors of the Winnipeg Electric Company.

C. J. Bell Chairman and F. W. Doolittle Director

Charles J. Bell, president of the American Security & Trust Company, Washington, D. C., and for years a member of the board of directors of the Washington Railway & Electric Company, has been elected chairman of the latter body to succeed the late Milton E. Ailes.

Emory L. Coblentz declined re-election to the board and F. W. Doolittle, vice-president of the North American Company, was named in his stead.

Messrs. Pearson and Buckland on Connecticut Company Personnel

At a meeting of the directors of the Connecticut Company, New Haven, Conn., on Jan. 12, E. J. Pearson of the New York, New Haven & Hartford Railroad was made chairman of the board of directors and E. G. Buckland was made vice-chairman of the board. All other officers of the Connecticut Company remain the same—J. K. Punderford as president, W. J. Flickinger as vice-president, etc. There are no changes in personnel whatever, except in the board of directors. In addition to the election of Mr. Pearson and Mr. Buckland to the respective offices previously mentioned, each of the Connecticut members of the New Haven's board of directors was invited to become a member of the board, as were also the trustees in whose hands the Connecticut Company was placed under the federal dissolution decree of 1914, just recently modified to provide for the restoration of the Connecticut Company to the control of the New Haven Railroad.

E. S. Pardoe Bus Superintendent in Washington

E. S. Pardoe has been made superintendent of bus operation of the Capital Traction Company, Washington, D. C. He has been with that company since 1919 in the engineering department, and since 1921 has been an assistant engineer. Mr. Pardoe attended the public schools of Washington and was graduated from the Technical High

E. S. Pardoe

School. He attended the University of Pennsylvania and later George Washington University, from which he was graduated with the degree of bachelor of civil engineering in 1924.

The bus operations of the Capital Traction Company have expanded quite rapidly in the last few years. That company operates seven lines, which, with two exceptions, are feeders or extensions of existing street car lines.

S. R. Inch President of Florida Power & Light

S. R. Inch has been elected president of the Florida Power & Light Company, organized on Dec. 28, 1925, in Florida as a vehicle for the operation of the properties in that state under the supervision of the Electric Bond & Share Company. The company is controlled through ownership of all of its second preferred and common stocks by the American Power & Light Company. The Florida Power & Light Company controls the properties operating the electric railway systems in Miami and Miami Beach, Fla. Mr. Inch is well known in the railway field. He became associated with the Utah Power & Light Company as general superintendent in 1913. Before that he had

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been located in Montana managing public utility properties owned by W. A. Clark. He was made operating manager at Salt Lake City in May, 1915, and less than three years later he succeeded C. E. Groesbeck as vice-president and general manager of the Utah Power & Light Company and vice-president of the Utah Light & Traction Company.

More Brooklyn City Appointments Announced

Last December C. E. Morgan, vice-president and general manager of the Brooklyn City Railroad, Brooklyn, N. Y., announced the appointment of Lester E. Curry, Hugh Savage and Hugh K. Sherman as superintendent of overhead lines, superintendent of equipment and purchasing agent respectively of that company. Mr. Morgan has now announced the following appointments:

L. J. Davis, assistant to general manager in charge of the mechanical and electrical departments.

H. F. Merker, chief engineer of way and structures. J. A. Rosenberger, acting superintendent of roadways.

V. A. F. Neillsen, superintendent of buildings.

C. A. Hammel, general storekeeper.

All five of these officials have been connected with the Brooklyn City Railroad or Brooklyn-Manhattan Transit organizations for several years. Mr. Davis and Mr. Merker will make their headquarters at the general office building, but Mr. Rosenberger and Mr. Neillsen will make their headquarters at the administration building, on Nostrand Avenue.

The way and structures department work for the B.-M. T. surface lines has been placed under the direction of Henry J. Kolb, who has been made chief engineer of way and structures for all B.-M. T. lines—surface as well as rapid transit.

C. W. Burke has been appointed assistant chief engineer of way and structure for the B.-M. T. lines.

Frederick L. Finch will continue as superintendent of surface roadway of the B.-M. T. surface lines, reporting to Mr. Kolb. Mr. Finch's headquarters will be at the new B.-M. T. surface track division office at Smith and Ninth Streets.

W. H. Wharton will continue as superintendent of buildings.

The trucking division of the B.-M. T. way and structures department, heretofore located at Nostrand Avenue, will be transferred to the 24th Street garage and the operation of motor cars will be under the direction of the surface transportation department. The maintenance of these motor cars will be cared for by the mechanical department as part of the work under the supervision of the general foreman of the Ninth Avenue inspection shop.

I. M. Burns Made Shop Superintendent in Brooklyn

I. M. Burns has been appointed to succeed the late George J. McDonough as superintendent of rapid transit inspection shops of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. Mr. Burns was advanced from the position of general foreman at East New York inspection shop. He will make his headquarters at the 36th Street inspection shop.

At the East New York inspection shop, C. I. Ekerman succeeds Mr. Burns as general foreman and J. C. Heiberg has been appointed assistant general foreman.

F. N. Parsons has been appointed superintendent of the new electrical repair shop at Gravesend Avenue and Avenue X, which was placed in service on Jan. 4, 1926. E. C. Parham is foreman at the new shop. The shop force and equipment were transferred from their old quarters at the 52d Street repair shop at the first of the year and the 52d Street repair shop was taken over by the Brooklyn City Railroad.

F. C. Horner in New General Motors Post

F. C. Horner of the staff of Alfred P. Sloan, Jr., president of General Motors, has been appointed assistant to Vice-President Alfred H. Swayne, chairman of the corporation's traffic association. Mr. Horner will be in charge of the development of the commercial motor vehicle field on electric and steam roads.

Under the direction of Mr. Horner, a railroad service department was started more than two years ago by General Motors to deal with this problem in a definite manner. This department is purely a transportation engineering research organization.

It is pointed out that General Motors having acquired the Yellow Truck & Coach Manufacturing Company is in position to take every advantage of the opportunity offered and at the same time promote the scientific co-ordination of rail and road transport facilities; thus aiding in the elimination of wasteful transportation methods both within and outside large terminal areas.

F. C. Shoemaker is now master mechanic and garage superintendent of the Illinois Power & Light Corporation at the Decatur property. He succeeds Charles H. Woods, who resigned late in 1925 to become a district sales representative of the International Motor Company. Mr. Shoemaker had been in the service of the Illinois Traction system at the general shops at Decatur for 3½ years when in July, 1922, he resigned to assume the position of staff engineer of the Texas Company, railway division. Before going to the Illinois Traction System he was connected with the old Fort Wayne & Wabash Valley Traction Company and the Fort Wayne & Northern Indiana Traction Company, at Fort Wayne, Ind.

William Goldner, in the employ of the Grand Rapids Railway, Grand Rapids, Mich., for 37 years, is on a leave of absence because of ill health. He has been succeeeded by Ernest M. Lunda, appointed superintendent of equipment, as referred to in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 21, 1925, page 933.

William H. Dougherty, prominent in the transportation department of the Williamsport Passenger Railways, Williamsport, Pa., has tendered his resignation. Mr. Dougherty started with the corporation in 1889 when horse-drawn cars were still in operation. He served as driver and later as conductor and motorman. He was made a dispatcher in 1900.

Walter J. Hodgkins, vice-president and general manager of the Lake Superior District Power Company, Ashland, Wis., in whose service he started at the very bottom sixteen years ago, was named vice-president and general manager of both the Michigan Gas & Electric Company and the Houghton County Gas Company at a meeting held in Chicago on Dec. 31. Mr. Hodgkins will continue to direct the activities of the Lake Superior Company at Ashland, where the general offices of the three companies will be centered. The Lake Superior District Power Company operates 17 miles of electric railway.

Obituary

F. P. Edinger

Frank P. Edinger, formerly superintendent of transportation of the Chicago Surface Lines, died on Dec. 20. He had been connected with the Chicago Railways or its subsidiaries since 1893. He began his career as a conductor and worked up through the transportation department. Later he became superintendent of one of the north side districts. In 1914 at the time of the unification of the surface lines he was transferred to the west side and placed in charge of the sixth division. Prior to his appointment as superintendent of transportation he served as acting superintendent. He next was made superintendent.

C. A. Gould

Charles Albert Gould, founder of the Gould Coupler Company and the Gould Storage Battery Company, died on Jan. 6 in New York City. Mr. Gould was a pioneer in the development of automatic car couplers, electric train lighting, vestibule passenger cars and other railroad devices. In 1869 he was an accountant in Buffalo and later served as postmaster of Buffalo and collector of customs. About ten years later he organized and became president of Gould & Stimson, which later grew into the Gould Coupler Company. He remained at the head of this organization until Jan. 1, 1925, when he disposed of his interest in the business to serve as president of the Gould Realty Company and the Gould Securities Company. He was born in Batavia, N. Y., in 1849. His hobby was horses and dogs. In his will he left $20,000 to "provide for the board and keep of all dogs and horses owned by me."

Caleb S. Jackson, formerly treasurer of the Eastern Massachusetts Street Railway, Boston, Mass., dropped dead on Jan. 2 in the subway station at Kendall Square. He was to have stood trial on three charges late in January over a shortage in his accounts of $48,000 discovered about a year ago. At that time he resigned as treasurer.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

High Hopes for Copper in 1926

Although the manufacture of copper products at the outset of 1926 is slightly less than was the case a year ago, no concern is felt for the year's prospects by large manufacturers in the field. In fact, quite to the contrary, anticipations of a most successful period seem to be the order of the day. Orders from the electrical industry are being received in gratifying volume, although no large activity in steam railroad electrification or in track extensions among the electric railways is apparent just now. The development program within these last two fields will doubtless be considerably accelerated within the next few weeks.

The outstanding feature in the copper trade during 1925 was the enormous domestic demand, far exceeding the expectations of even the most sanguinary observers. Large deliveries in the month of December to American mills brought the stock of marketable copper to the lowest point in the history of the commodity, notwithstanding lower exports. With consumption of copper outrunning production it is scarcely to be wondered that a spirit of optimism prevails in the industry.

So far as European consumption is concerned the falling off in purchase has not been occasioned by any reduction in the need for the metal. It has simply been impossible for foreign consumers to lay their hands on the necessary funds with which to finance their buying. The general belief is that conditions in Europe are slowly but surely improving, and if this is actually the case the copper industry will probably benefit as much as any other American enterprise. Development of the tremendous domestic consumption of copper and copper products has taken place over the past four years and no evidence is at hand to show that the end is in sight.

1925 Car Equipment in New York City Totaled $9,000,000

Material additions to rolling stock in operation were made in 1925 by the railways under the jurisdiction of the New York Transit Commission, having authority in New York City. One hundred and fifty-four new steel rapid transit cars and 335 new trolley cars, bought by direction of the commission and with its approval, went into service, representing a total expenditure for these two items of about $9,000,000. Trunk line cars to the number of 130 were also placed in operation. With the additions named to the rapid transit and surface line cars, there are now approximately 13,125 cars used in operation upon local transportation lines in the city of New York. It is estimated now that the subway, elevated and surface cars required to carry New Yorkers each business day represent an approximate investment of $111,000,000. Toward the close of the year the Brooklyn-Manhattan Transit Corporation directed that bids be asked for supplying 201 articulated cars to form 67 triplex units for rapid transit use.

Big Order for Timken

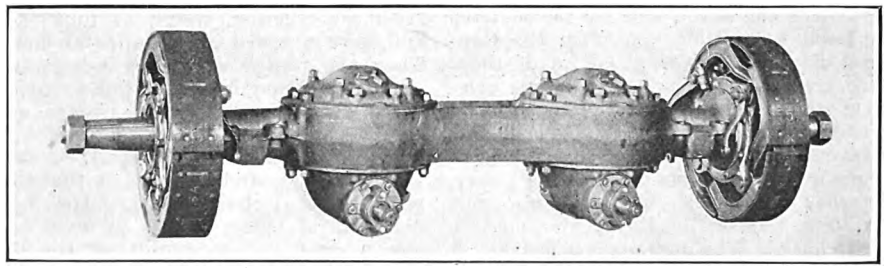
Axle Equipment for the 333 Public Service Buses in New Jersey Has Unique Features

Several departures from conventional practice characterize the axle equipment being supplied by the Timken Detroit Axle Company for the 333 gas-electric buses recently ordered by the Public Service Corporation of Newark, N. J., from the Yellow Truck & Coach Manufacturing Company. The axles are similar to those used under the 210 gas-electric buses delivered in 1925 to the Philadelphia Rapid Transit Company.

The rear axle will have the dual worm drive, known as type 6530, for the dual motor drive type of gas-electric bus. It was designed and built especially for the Yellow Truck & Coach Manufacturing Company. It is constructed for underslung springs and Hotchkiss drive. The housing, or body of the axle, differs from ordinary practice in that it is a one-piece drop forging. Because of the dual electric motor drive, two driving units are necessary and two bowls must be provided to accommodate the two driving units. The underslung spring pads and the flanges for mounting the brake mechanism are forged integral, presenting a very difficult forging problem.

Special machine equipment was provided to build this double bowl banjo type of housing. The forging is bored to provide a housing for the axle shaft and also to provide a suitable mounting for the driving unit. This design provides an exceptionally strong rear member to withstand the exacting requirements of heavy-duty motor coach service.

The front axle was also designed especially for the Yellow Truck & Coach Company. It is suitable for heavy-duty bus service and is of the inverted Elliot type with inclined steering knuckle pins. A steering knuckle pin angle of 8 deg. and a wheel camber of 1½ deg. are used so that the center line of the steering knuckle pin produced to the ground very nearly intersects the tire contact on the ground. Other features of the axle equipment are more or less similar to conventional axle practice, although specially designed for heavy-duty work and to accommodate themselves to the various new departures mentioned.



Special Type of Timken Axle for Use Under New Public Service Railway Buses

Proper Materials Handling a Factor in Safety

The importance of materials handling among manufacturers is obvious. Scarcely less apparent is the prominence which marks this consideration among the operating companies and particularly with respect to shop and maintenance practice. For these reasons it is well to recognize what an important and serious factor materials handling is in the present day accident problem. In itself it is responsible for about one-third of all industrial accidents in the country and approximately one-fourth of the lost time. The annual economic loss involved is estimated at $250,000,000.

A number of pregnant suggestions on this subject were made by David S. Beyer in a paper which was presented at the annual meeting of the American Society of Mechanical Engineers in New York early in December. Among these were the substitution of mechanical handling of materials for manual handling wherever possible, the provision of necessary mechanical protection and safe working arrangements, designing and purchasing new equipment and proper emphasis on the human element as represented by intelligent supervision of the work in progress to avoid unnecessary chance taking, proper selection of men for the job they are doing and prompt first aid measures for minor injuries.

Ever increasing attention is being given to this subject by manufacturers and operating companies in the electric railway field. It is a field of effort which pays big dividends in the long run due to the reduction in damage charges and insurance rates.

Traction Progress Reviewed

"Engineering Achievements for the Year 1925" is the title of a booklet recently issued by the Westinghouse Electric & Manufacturing Company. H. W. Cope, assistant director of engi-

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neering, is the editor. As stated in the introduction, the purpose of the publication is to give credit where credit is due and to enumerate some of the outstanding achievements made by the engineering departments during the past year. Practically every phase of the engineering activities of the Westinghouse company is covered and considerable attention is given to developments in railway traction, self-propelled cars and locomotives, such as the gas-electric and oil-electric, and to the many improvements in the gas-electric bus.

Date Set for Submission of Bids on B.-M. T. Cars

Feb. 15 has been specified as the final date for submitting of bids on 67 triplex car units for the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. As reported previously in the ELECTRIC RAILWAY JOURNAL, approval was secured on Dec. 17 from the New York Transit Commission of the general plans and type of triplex units which have been in operation for the last three months. The cost of the 201 cars or 67 triplex units is estimated between $4,000,000 and $5,000,000. After the bids have been received they will be submitted to the Transit Commission for its approval of the award and the contract and the plan for financing under which payment will be made for the cars.

Some New Haven Equipment on Order

The New York, New Haven & Hartford Railroad expects to receive about March 1 the seven electric locomotives ordered some time ago from the General Electric Company. Five of these are freight electrics and two are electric switchers. In addition there is on order at the present time by the New Haven the following electric equipment: 25 multiple-unit motor cars, Osgood-Bradley; 37 multiple-unit trailers, Osgood-Bradley; three electric switchers, Westinghouse Electric & Manufacturing Company, and five 73-foot combination passenger and baggage gas-electrics, J. G. Brill Company.

It is probable that the gas-electric rail cars will be used on various branch lines where traffic is comparatively light.

Metal, Coal and Material Prices

Metals—New York	Jan. 19, 1926
Copper, electrolytic, cents per lb	14.10
Copper wire base, cents per lb	15.00
Lead, cents per lb	9.25
Zinc, cents per lb	8.65
Tin, Straits, cents per lb	61.75
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.975
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N. Y., cents per lb	18.25
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.90
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.03

Farewell Party for E. R. Fitch

Ellery R. Fitch, for the last five years district engineer of the Westinghouse Air Brake Company, Westinghouse Traction Brake Company and the Safety Car Devices Company, located in St. Louis, has been transferred to New York City in a similar capacity. Mr. Fitch leaves a host of friends in St. Louis, and to show their appreciation they gathered on Dec. 31 and presented to him a handsome watch, chain and knife. An inscription on the back of the watch reads: "To a Regular Fellow, from the St. Louis Gang, 1925."

Twenty members of "the gang" also proceeded to "say it with poetry" and presented a framed testimonial of affection to their erstwhile comrade.

Rolling Stock

Georgia Railway & Power Company, Atlanta, Ga., has purchased five modern, low-step interurban cars for use between Atlanta and Stone Mountain, Ga. The cars will cost approximately $18,000 each.

Penn-Ohio System, Youngstown, Ohio, has authorized an appropriation for ten freight trailers designed according to specifications recently adopted by the master mechanics of the Central Electric Railway Association. The order for these cars will be placed with the Kuhlman Car Company at an approximate cost of $3,500 each.

Columbus, Delaware & Marion Electric Company, Columbus, Ohio, is securing two new chair cars for operation between Marion and Columbus. These cars are 62 ft. in length over all, all steel construction, weigh 51 tons each and have a speed of 75 miles an hour. They are parlor cars and incorporate all the latest equipment, windows being plate glass set in bronze frames and counter-balanced. Each window is 4 ft. in width and 2½ ft. long, equipped with a storm sash and hinged so that the windows may be washed. The rear platform of these cars is inclosed and has a door in the center of the car with a French window on either side, making an observation platform, and at the same time eliminating the entrance of dust. The main bodies of these cars will seat 27 persons and the smoker will accommodate eight persons. The cars are electrically heated and are equipped with both hot and cold water. The electrical equipment consists of four 145-hp. motors with helical gears and pinions to eliminate noise.

Trade Notes

J. H. Mahler recently joined the Electric Service Supplies Company, Philadelphia, as bus specialist. After serving in the World War Mr. Mahler completed the test course of the General Electric Company at Schenectady, N.Y., and the electrical engineering extension course at Union College, Schenectady, N. Y. He was connected with the research laboratory and Dr. Steinmetz for two years during the development of the lightning generator and high-voltage insulation tests; later Mr. Mahler joined the air brake engineering department of the General Electric Company at Erie, Pa.

Albert S. Richey, electric railway engineer of Worcester, Mass., has had reprinted for distribution his article "Electric Railway Costs and Fares Continue Stable in 1925," published in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 2, 1926.

Donald J. Roder, formerly with the Michelin Tire Company, has joined the New York sales force of the India Tire & Rubber Company, covering the territory around Syracuse. Mr. Roder was with the Michelin company for the last twelve years. He is well known in the Syracuse territory.

Okonite Company, Passaic, N. J., has opened a new office on the Pacific Coast. The new quarters, which will also be shared by the Okonite-Callender Cable Company, Inc., are located in the Hoge Building, corner of Second Avenue and Cherry Street, Seattle, Wash. This office, in connection with the branches already established in San Francisco and Los Angeles, places Okonite products and service within immediate reach of buyers all along the coast.

New Advertising Literature

Rome Wire Company, Rome, N. Y., is publishing a series of bulletins dealing individually with every type of wire. The first two, dealing with magnet wire and super service cord, have been widely distributed. The third, dealing with bare wire, is now ready for distribution. This bare wire catalog contains data and tables regarding construction, sizes, weights, current-carrying capacities and makes a handy book for reference. The Rome Wire Company will gladly send copies of any of these bulletins to those who express a wish for them.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet 20266 on "The Articulated Car of the B.-M. T. Lines, Rapid Transit Division." This four-page leaflet, attractively presented in two colors, illustrates the important electrical equipment, includes the wiring diagram of the articulated car and in addition to a complete description of the motor equipment and accessories elaborates on the importance of this equipment as representing the latest development for rapid transit service.

Dayton Mechanical Tie Company, Dayton, Ohio, has a booklet setting forth the advantages of mechanical tie equipment for use in paved streets. As stated in the foreword of the pamphlet, the purpose has been to show by the history of street railway tracks where wood ties have failed and why, and how these failures have suggested their own cure. The Dayton tie was evolved to obviate the failures resulting from the older type of equipment. Numerous illustrations are included in the booklet showing instances where Dayton tie equipment has been in service over a period of years with excellent results. Various costs and operation data on the mechanical ties are included.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 67 New York, Saturday, January 30, 1926 *Number* 5

Valuable Study on Franchises Is Expected

FOLLOWING an extensive tour of Europe, the Illinois legislative committee which is making an investigation of franchises, with particular reference to terminable permits, is now touring this country. Legislative junkets are not unusual, but seldom is a study of this magnitude made. This committee has nearly two years from the date of its formation in which to report. In this interval and with the opportunity to study so many cases first hand unusual means will be available for compiling one of the most complete works on modern franchises.

In some respects the opportunity before this committee is like that of the legislative committee of the State of Massachusetts formed years ago to investigate the relationship between street railways and cities and towns. That committee, after extensive studies here and abroad, published in February, 1898, through its secretary, Charles Francis Adams, what remains to this day one of the most complete works on franchises. In this case the conclusion was that the best form of franchise was a revocable permit. Revocable permits are still common in Massachusetts, although that state has not adopted the more complete type of terminable permit which is especially adapted to state regulation and which was introduced by Wisconsin in 1907.

Today only eight states provide for terminable permits for street railways. And in these eight states there are quite a number of companies operating under term franchises. The American Electric Railway Association in 1924 prepared a report on this subject favorable to this form of franchise. Investment bankers favor the terminable permit. Moreover, the National Municipal League and other civic associations have repeatedly indorsed this form of grant.

Two considerations have militated against the terminable permit. Public utility operators have not acted in concert to support it and the provisions in some of the terminable permit laws have made them undesirable. Provisions that institute a form of city control or that permit cities to levy heavy special taxes against utility corporations tend to make such laws unpopular in a time when the tendency is toward reducing the amount of taxation that must be passed on to the consumer. It has been realized for years, especially since the period of difficulty in financing electric railways which followed the war, that the terminable permit is the modern form of franchise. Error, if error there be in the terminable permit, does not lie in the permit as a form of grant, but rather in the lack of proper application of the principle back of the idea.

The members of the Illinois legislative committee have the benefit of years of regulatory experience and a historical background of 27 years more of public utility control and regulation than did the Massachusetts committee in 1898. They have the opportunity within their grasp to produce a report that every one interested in public utility regulation will want to study and one that every operating company will want in its library. It can only be hoped that the Illinois terminable permit bill, for no doubt there will be one, will be so inclusive as to mark an epoch in the history of franchise settlement matters.

Governmental Stinginess Again Threatens Efficiency of Patent Office

FUNCTIONING of the United States patent office has been improved recently by increased salaries for examiners, but its efficiency is now being impaired for another reason. Federal judges, under whom exclusively the adjudication and enforcement of patents are performed, are resigning because of inadequate salaries. Men well versed in patent law are leaving the bench and are being replaced by men who will have to become proficient as they decide cases. These federal judges do not have opportunity to add to their incomes by outside work.

United States district judges receive $7,500 per year, circuit judges $8,500. Judges of the Supreme Court in the state of New York receive $17,500; in New Jersey $18,000; Pennsylvania $17,500; Illinois $15,000; Massachusetts $12,000; Michigan $10,000. The federal judges have social and professional obligations at least equal to the obligations of state judges, but their salaries do not permit the filling of their obligations, especially in the larger cities.

There are 191 federal judges in the United States and their present combined yearly salaries amount to $1,535,991.91, about 1½ cents per inhabitant. Bills providing for an increase of about ½ cent per inhabitant have been introduced into Congress. They provide for raising the salaries of the chief justice of the United States to $20,500; associate justices of the Supreme Court to $20,000; circuit judges in the second circuit, comprising New York and Vermont, to $15,000; circuit judges in the four next most populous circuits to $14,000; and circuit judges in the remaining of the nine circuits to $13,000.

The bills provide for the district judges $10,000, with the provision that if the population in a district exceeds 2,000,000 the salaries shall be increased $500 for each 100,000 population in excess of that sum up to within $1,000 of the circuit judge's salary. If the differential in favor of the salaries in the more populous districts should not be enacted, then the salaries for the district judges in general should be correspondingly raised.

These proposed increases are in no way extravagant. Certainly it is well for industry to have the federal judges, who handle its patent cases, free from the personal financial worries bound to exist when salaries are inadequate; free to give the careful thought and concentration demanded by their judicial duties.

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They Are Talking It Over Again in New York

MAYOR WALKER of New York has at least started right with respect to the traction problem. He appears anxious to do what he can to help and to make good on his pre-election promise to bring some measure of relief. As a first step in that direction he recently had the members of the State Transit Commission and the City Board of Transportation confer on the situation as it now stands. Since then he has conferred with officers of the Interborough Rapid Transit Company.

With the Mayor's own proposal of debt exemption for city bonds to be used to finance new construction there is much chance to find fault on the score that it is unsound economics. At best it would take several years to have his proposal enacted. It is hardly in place here to refer to the suggestion except that it indicates one trend of thinking. As for the Transit Commission, General O'Ryan still thinks that the plan of unification of the transportation lines, first advocated by that body several years ago, is the best move that could be made looking toward an improvement in the situation in the near future. Altogether, there are many suggestions of ways to accomplish a much-needed result. Some of these suggestions are practical, but as indicated before, many are highly impracticable.

There is no need now to attempt to analyze even the most important of the proposals made. The matter has not yet got beyond the discussion of preliminaries. The important point is that the discussion is in tones of helpfulness and not of recrimination. That in itself is distinctly a pleasant change. But pleasant as it is, it is after all action that is needed. The public officials most intimately concerned and the representatives of the railways may hobnob under the most favorable business relations, but unless the former do more than that the public will be no less inclined to find fault with their elected representative than they were when the principal incumbents of City Hall vied with contestants at Madison Square Garden for sporting honors and public officials said it with slang instead of with shovels.

Outworn Arguments Advanced Against Interstate Common Carrier Regulation

LOUD wails of anguish are heard in certain quarters because a bill to regulate interstate commerce by motor vehicles operating as common carriers on public highways has been introduced in the United States Senate. The Truck Users National Conference is distributing a pamphlet in which the proposed legislation is described as "a menace to motor carriers." Threats of "confiscation" and "monopoly" are carried in this bill, says the association. Sponsorship of the bill is attributed to the American Electric Railway Association, the American Railway Association and the National Association of Railroad and Utilities Commissioners, and this seems enough to condemn it in the eyes of the truck users. All the familiar arguments against a regulated monopoly and favoring unrestricted competition are paraded again.

One is reminded of the passage in the Bible telling that "now there arose up a new King over Egypt which knew not Joseph." From time to time there arises a new generation which knows not that our present system of utility regulation was arrived at after long and costly experimentation. Worn out and discarded theories concerning the desirability of competition in providing transportation facilities are brought forward as new discoveries.

What would the unlicensed interstate common carriers say if the electric and steam rail lines, now so closely regulated, should participate in a general free-for-all scramble for traffic by cutting rates? Would the unregulated carriers like that? Probably not. For others they believe in careful supervision that compels the provision of regular and adequate service at reasonable rates. For themselves they want the privilege of coming and going as they please, and particularly of charging whatever rates they please.

But public memory is short. Many people have forgotten and others perhaps never knew that this question was first raised many years ago, and that experience has shown in countless cases that the public benefits most when transportation is a regulated monopoly. So long as these outworn arguments are advanced against regulation the railway companies must remain alert and aggressive in answering them and demonstrating their fallacy.

Customer Satisfaction a Goal for the Railway Operator

OCCASIONALLY there is cause for condemnation as to why some men fail and why others make good in business. Men are heard of who are especially successful in real estate, in baseball, in music and in many other fields. Why should not a little of their acumen be applied to the hard-working business of local transportation? A recent example is one "Red" Grange, who broke from the sporting sheet into the front pages of the newspapers so frequently a few months ago that many began to wonder what all the fuss was about. Attendance at professional football games jumped from twenty and thirty thousand to fifty and seventy thousand. The sport writers say the answer is that "the customers leave satisfied." They came for thrills, runs and surprises; saw what they wanted, left satisfied, and told the world about it.

How can a railway develop enough interest to double its business? Maybe it can't, but it can help things along quite a little by "satisfying the customer." Too many of our railways are doing things not because the public wants them, but because they are following tradition and give the public no choice in the matter. If they think longitudinal seats will enable them to crowd more passengers into a car they turn a deaf ear to a public that wants to face forward when it rides.

The companies that have consulted with the public about their cars, their seating arrangement, and similar matters, have done much in this regard. Even little trick devices that do not save money but give a little element of surprise help a great deal. The rush-hour crowd says to the folks at home, "Have you seen the new bulletin boards on the cars," or "How do you like the cushions on those new seats," and in other ways takes an interest in the car ride instead of regarding it as a part of the daily drudgery of going to and from work.

Sad tales of paving burdens, high taxes and other inequalities to which they are subjected will do the railways no good unless they "satisfy the customers."

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"Co-ordination"—Theme of New York Railway Association Meeting

PART of the work of furnishing co-ordinated transportation is the molding of a co-ordinated viewpoint. That this latter has been about accomplished was evident to members of the New York Electric Railway Association who were privileged to hear the addresses of E. F. Wickwire and John A. Ritchie at the midwinter dinner of that association in New York on Jan. 27.

The bus arrived in the field when the electric railway industry was at a low ebb and succeeded in living "off it" for some time. Mr. Wickwire said the industry was better now and was not going to stand that treatment any longer, but was making adequate plans for having the bus live "with it," assuming its own duty and accepting its own responsibility.

Mr. Ritchie, on the other hand, having lived through early bus days, recognizes the street car as typifying an industry with experience and financial backing. He recognizes the futility of strife and the desirability of co-ordination. He expounded the theory that ELECTRIC RAILWAY JOURNAL has often expressed that a co-ordinated operation carries with it the responsibilities of a co-ordinated investment. If rail lines are to be abandoned the successor vehicle must be allowed to earn a sufficient amount to retire the original investment. Otherwise what attraction will there be in transportation investments if the old money must be lost every time the wind changes and a new type of vehicle or method comes into the field?

Many other expressions of these two men, typifying, as they do, the railway viewpoint on the one hand and the bus on the other, show the progress that has been made in welding these two great ideas into one of greater service in the field of transportation.

Internal Co-operation the Main Objective in Modern Corporations

THE greatest objective in modern industrial personnel work is to secure the maximum amount of co-operation between all departments and between all the individuals in each department. Years ago, when corporations were small, very little effort was necessary to bring about this co-operation. Most of those engaged in the same shop knew each other and took an interest in what their fellow workers were doing. As corporations grew in size, the interest of the average worker in the success of the company as a whole naturally became less. His weekly pay envelope, rather than the financial interests of his employers, was the most conspicuous object on his mental horizon.

Within recent years effort has been made by most large companies to correct this situation as far as possible, and a number of electric railway companies have led in this movement. The task is not an easy one, because as a company grows in size, it becomes increasingly more difficult to diffuse through all of the departments an interest in the work and knowledge of the policies of the company. It is fortunate, therefore, that a paper on ways of securing internal co-operation was presented at the meeting this week of the New York Electric Railway Association, by an official in a company which has been conspicuous for its success in this direction.

Dr. Segard has no wonder cure for bringing about the result sought. His remedy is the simple one of education on the aims of the company, coupled with encouraging a willingness on the part of each worker to give to his fellows and receive from them all the helpful assistance possible. This means also, of course, a readiness to receive these suggestions and other assistance in the right spirit, because, with most people, so far as suggestions are concerned, it is far more blessed to give than to receive. Nevertheless, the man who is unwilling to accept suggestions, associate with others in business on a friendly basis and help them with his own experience has largely outlived his usefulness.

Methods of Training Future Executives Deserve Careful Consideration

SYSTEMATIC training for young men for executive positions in the electric railway industry was advocated in a paper by R. E. Danforth presented at the midwinter meeting of the New York Electric Railway Association. Ordinarily, suitable material for future executives is to be found in any organization of considerable size. How best to insure its development is the problem. That the solution should be left to chance is unthinkable. In the opinion of Mr. Danforth, schools for trainmen, lectures, etc., do not go far enough. A definite program is needed for the selection of promising candidates for advancement and their subsequent training.

It must be admitted that many of the present executives of the electric railway industry have risen from the ranks by their own perseverance and effort without any special course of training. Why, then, bother to train young men for executive positions? Times have changed and the industry itself has changed. It has grown in size and complexity. Competition unknown 20 years ago has reached a serious stage today. Methods of training and advancing employees should be modernized just as much as the physical plant.

Experience alone does not today fully equip the individual for an executive position, nor does an education, whether technical, legal, scientific or classical. Other qualities are needed today, including the ability to express one's ideas clearly and to get them across successfully to others. Familiarity with the practices and work of all departments of the railway is valuable to those suitable for advancement. Opportunity to gain such knowledge should be given to the more able and progressive men of the organization.

Young men should be selected for this purpose when first employed, according to Mr. Danforth's theory, or soon thereafter. High school graduates should be shifted from department to department systematically for a year or two, to give them a working knowledge of the methods and problems of each. These young men may then be placed in the ranks of any department and permitted to grow up there until age, experience and evident ability show them ready for promotion. For others who have had college educations, he advocates a cadet engineer's course, after the completion of which they may be placed in minor supervisory positions, used as executive clerks to the general manager, or placed on the engineering staff. As one of the pioneers in the field of systematic training of young men in the electric railway industry, Mr. Danforth speaks with knowledge and experience, and his opinions deserve the careful consideration of the present executives.

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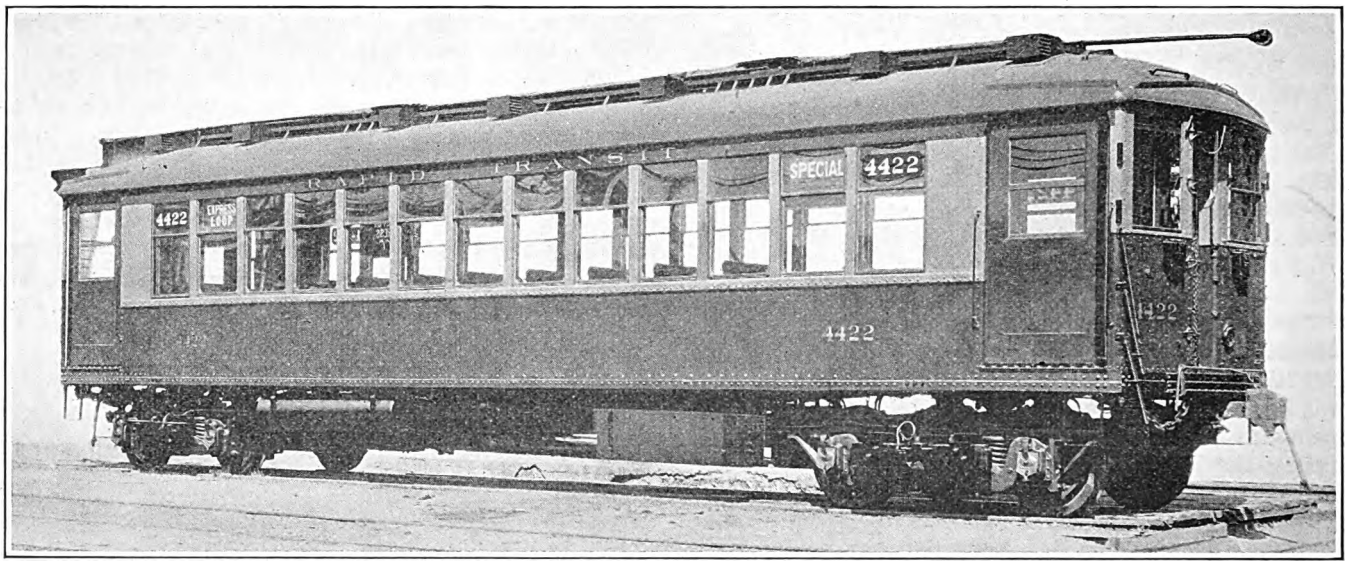


One of the New Cars. Steps Are Unnecessary Because High Level Platforms Are Used at All Stations

New Cars for the Chicago Elevated

Several Features Are Included to Give Greater Convenience and Comfort, Although the New Equipment Is Practically a Duplicate of that Already in Service

By Colin K. Lee
General Engineer Westinghouse Electric & Manufacturing Company

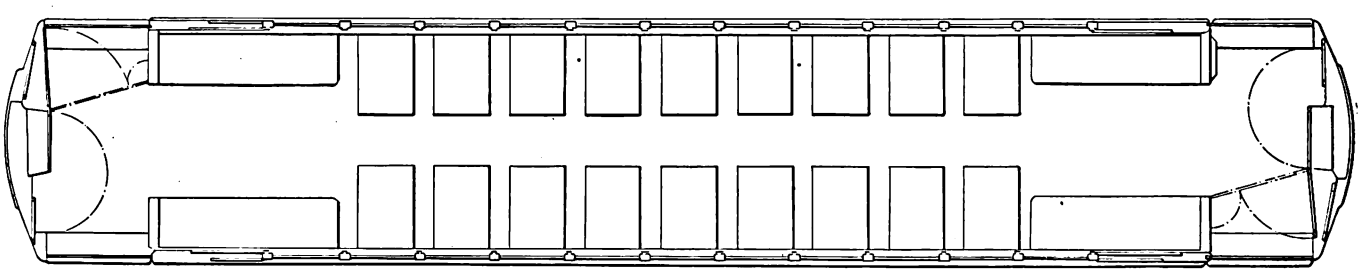
ONE HUNDRED new steel cars have been ordered by the Chicago Rapid Transit Company recently to increase the service on its elevated lines. The electrical equipment is virtually a duplicate of that ordered in 1922, and that in turn was practically a duplicate of the 1914 order. An accompanying table gives the principal dimensions of the new cars. Particular attention has, however, been given toward providing a car of pleasing appearance both inside and out.

Seats are provided for 52 passengers. Thirty-six can be accommodated on the cross-seats. Four longitudinal seats, one at each corner of the car, provide for the remaining sixteen passengers. The seats are soft and plush covered. They are a trifle wider than those usually found in city service, being 37 in. wide. The seat spacing is 32½ in., which also provides somewhat more knee room than is usually found. The increased width of the seat has narrowed the aisle somewhat, so that this is but 21¾ in.

Hand straps of a white enamel rigid type are used only at the ends of the car over the longitudinal seats, which are 6 ft. long. Looking through the car from one end, the passenger is impressed particularly with the unobstructed view. There are no vertical stanchions in the line of vision, which usually give a crowded appearance, regardless of their desirability for convenience of standees. The clear vision of the passengers is also extended to the side windows, which are arranged particularly to give an unobstructed view outside with no guard railings. Plate glass gives a rich effect and there is no danger of outside objects presenting a wavy appearance.

Arch-type roofs are used and the line where the roof joins the end partition has a simple graceful curve. Lights are arranged in three rows, one down the center of the car and one row on each side. The lighting fixtures are attractive. Deep translucent shades shield the lamps so that direct rays do not annoy the passengers. Efficient lighting is obtained through the use of the white enameled arch ceiling. The interior finish, aside from ceiling and floor, is mahogany. Twelve ventilators are arranged in the roof. In addition, two 12-in. electric fans are provided, one at each end of the car. These fans are driven from a storage battery.

Particular attention has been given to make the car warm and soundproof. Thick salamander insulation



Floor Plan and Seating Arrangement of the New Cars

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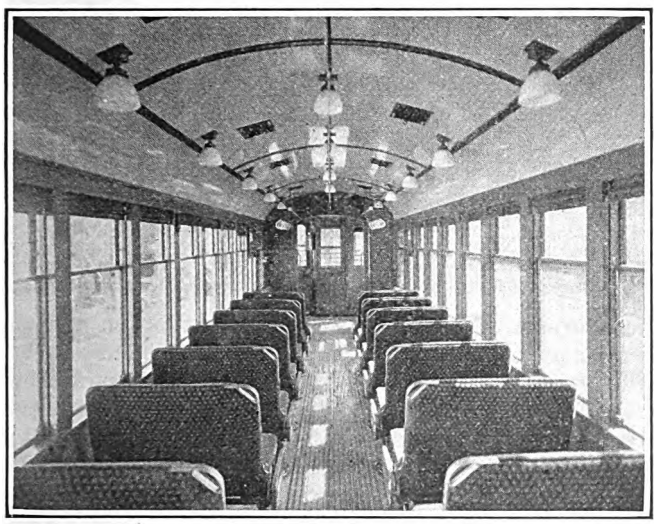
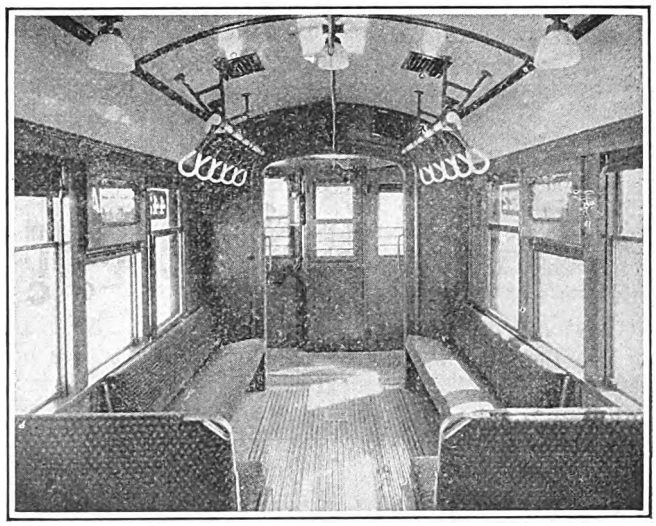


Seats Are Wide and Plush-Covered. Lighting Is Good and Passengers Are Afforded an Unobstructed Vision

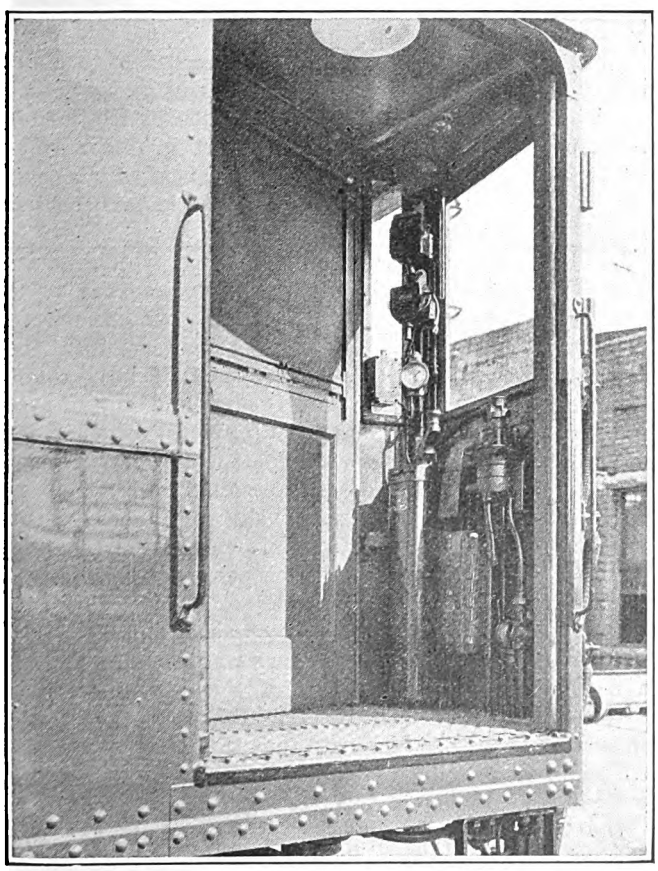


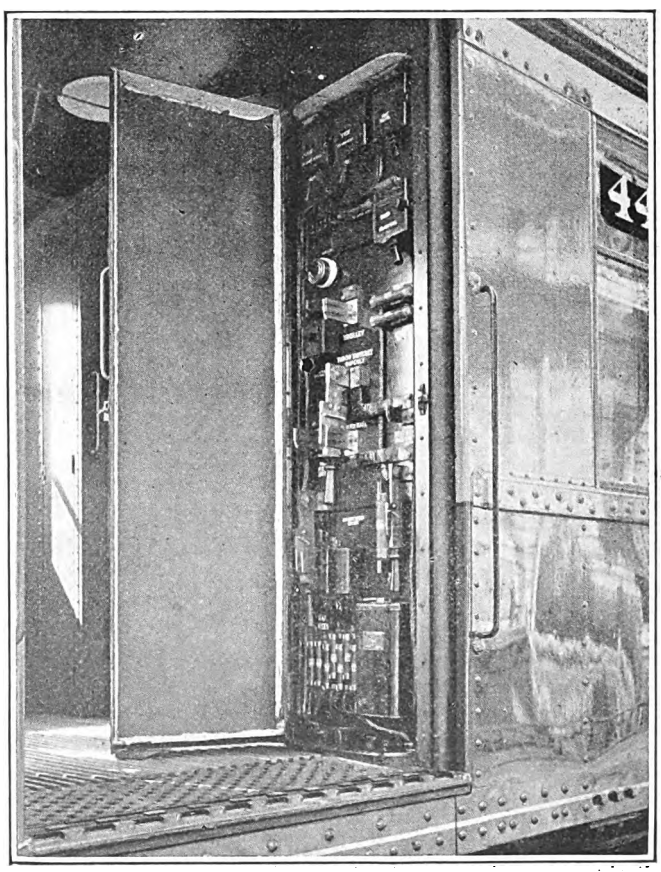
Short Longitudinal Seats at the Doorways Help to Prevent Congestion by Providing a Wide Aisle at Ends

is used, with double wood floors on top of the steel plates. Exposed sheets, such as sides and letterboards, are of Armco iron. Other details of reconstruction include 12.25-lb. I-beam center sills, 6-in. channel side sills, ⅜-in. pressed cross-sills, ½-in. continuous floor plate, ⅛-in. steel headlining and pressed steel side posts and doors.

The motive equipment consists of two Westinghouse No. 567-R-1 motors, both mounted on one truck. These motors are a standard Westinghouse type, slightly modified to meet local conditions. Covers and axle caps are chained to the frame as a loose piece is particularly undesirable in elevated car operation. Other important features of this ventilated motor include through axle cap bolts, bolted commutator, dust guards, axle shields, tapped field, pressed steel gear case, etc. Strap windings are used without sharp crossovers. The control is type ABLFM, which includes automatic acceleration, energy control supplied either from battery or direct from the line and field control for the motors. It is arranged for operation in conjunction with existing elevated equipment, which includes General Electric type M.

The motorman's compartment occupies the front right-hand side of the platform at each end of the car. This is inclosed by a door which stands lengthwise





At Left—Motorman's Compartment Is Located at the Front Right-Hand Side of the Car. When Not in Use It Is Made a Part of the Vestibule by Closing the Door to Conceal the Operating Equipment. At Right—The Switch Panel Is a Completely Inclosed Unit on the Platform

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Principal Dimensions and Equipment of Chicago Rapid Transit Cars

Number ordered	100	End door opening	22½ in.	Couplers	Sterns & Ward automatic—Van Dorn automatic
Builder	Cincinnati Car Co.	Truck centers	33 ft. 8 in.	Door-operating mechanism	National Pneumatic
Seating capacity	52	Wheelbase motor truck	6 ft. 6 in.	Heaters	Consolidated Car Heating Co.
Length over all	48 ft. 0 in.	Wheelbase trailer truck	5 ft. 6 in.	Motors	Two Westinghouse 567-R-1, 170 hp. at 600 volts
Length over body	37 ft. 10 in.	Diameter wheels motor truck	34 in.	Seating material	Plush
Length of platform	5 ft. 1 in.	Diameter wheels trailer truck	31 in.	Trucks	Baldwin Class 66-30-AT, Special, and Baldwin Class 78-30-A, Special
Extreme width over eaves	8 ft. 10 7/8 in.	Height rail to center of drawbar	29½ in.	Ventilators	Railway Utility Co.
Width over side sheathing	8 ft. 6 1/8 in.	Post centers	2 ft. 7½ in.	Wheels	Driving truck, 34 in.; trailer truck, 31 in.
Rail to bottom of side sill	3 ft. 2 in.	Weight complete	76,400 lb.		
Rail to top of roof	12 ft. 3½ in.	Body	Steel		
Width cross-seats	37 in.	Interior trim	Mahogany		
Width of aisle	21½ in.	Roof	Arch		
Length of longitudinal seats	6 ft. 0 in.	Air brakes	Westinghouse type AMU.		
Sliding side door opening	3 ft. 8 in.	Control	Westinghouse ABLFM		

of the car when occupied by the motorman. When not in use the door swings forward and incloses the motorman's control devices. The control equipment must thus be capable of installation in a comparatively narrow space. The master controller is type XM-110. It is provided with three drums, placed one above the other, with three concentric operating shafts. The reverse handle is arranged so that it cannot be left when the motorman leaves his post.

A new feature is the arrangement of the switchboard equipment. A full length steel cabinet is built into the platform face of the bulkhead at the left side of the platform. This contains the panel bearing, three heater switches, switches for lights and air compressor and the large knife switches for trolley and third rail, heat and light bus, main motors, air-door-switch cut-outs, together with the necessary fuses. Each item is marked plainly, and in spite of the large number of devices the space occupied is surprisingly small.

Fellowships Offered in Transportation

FIVE Strathcona Memorial Fellowships in Transportation, of $1,000 each, are now being offered annually for advanced work in transportation at the graduate school of Yale University. Special attention will be paid to the construction, equipment and operation of railroads and other engineering problems connected with the efficient transportation of passengers and freight, as well as the financial and legislative questions involved. Transportation by water, highways or airways and the appropriate apparatus involved, and also other general aspects of the broad field of transportation, embracing its legal and economic phases, will be included in the list of subjects which the fellows may select for investigation and study. The holder of a fellowship must be a man who has obtained his first degree from an institution of high standing. In making the award, preference is given, in accordance with the will of Lord Strathcona, to such persons or to the sons of such persons as have been, for at least two years, connected in some manner with the railways of the Northwest.

Applications for these fellowships should be addressed to the dean of the graduate school of Yale University, New Haven, Conn., before April 1, on blanks which may be obtained from him. Applicants must submit with their application a brief biography and a certified record of their previous courses of study in college or technical school and their standing therein. They should also submit testimonials bearing upon their qualifications. A recent photograph of the applicant is requested.

Various courses of study relating to transportation along engineering, economic and legal lines are now offered by Yale University. Upon completion of the pending survey of various fields of transportation and the character of instruction and investigation therein there may be anticipated some rearrangement of certain of the courses above cited and some amplification thereof. Pending such adjustment, the Strathcona Memorial fellows will be entitled to pursue investigation in those aspects of transportation in which the university now offers competent guidance and supervision.

Reducing Gear Noise

Tests on a Large Variety of Motor Gears Show that the High-Pitched, Bell-Like Tone Which Is Most Penetrating and Annoying Can Be Reduced by Bolting on Pads of a Rubber-Asphalt Material

BY E. S. SAWTELLE
Assistant General Manager Tool Steel Gear & Pinion Company, Cincinnati, Ohio

NOISES of two distinct types emanate from electric railway car gearing. The first is a low tone vibration or rumbling, which comes primarily when the gears and pinions are not meshed properly for perfect involute action. The second is a high-pitched, bell-like tone which is found to have great penetrating and carrying power. Concerted efforts are now being put forth by electric railway operators and manufacturers of railway equipment to reduce all types of noise which come from car operation. For some months the writer has been carrying on tests in an effort to find a solution for the problem of reducing the noises which come from ringing gears and which are particularly objectionable to car riders.

The low tone vibration or rumbling which comes from car gearing is due either to worn gearing or to worn or poorly maintained bearings, which permit spreading of the gear and pinion centers. In the extended observations which I have made I have found it extremely unusual for new gears and pinions to produce undue noise. The most obvious solution for reducing the rumbling type of noise is to correct bearing troubles, maintain closer gear and pinion centers and where the gearing is excessively worn to replace it. On many properties gears are left in service too long for quiet operation, as these properties consider the replacement of gears too expensive, and so they are left in operation, despite the increased noise.

The introduction of helical gears was based primarily on noise elimination. Reports of the equipment committee of the American Electric Railway Association for several years past indicate that this type of gearing has reduced gearing noises. This type of gearing, however, like the spur type, cannot be expected to be in the best operating condition if bearings are permitted to become badly worn or if the gear and pinion are excessively worn or in poor alignment. Observations of helical gears in service show that where

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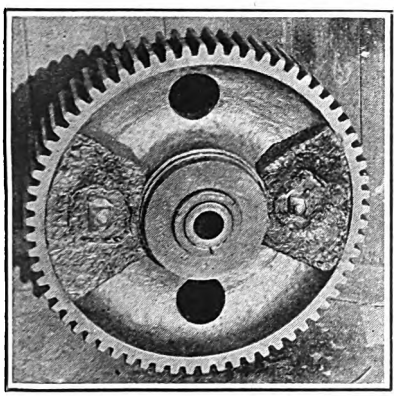
excessive noise is found this is due mainly to their being in a worn condition.

The low-toned rumble of gearing is akin to the general industrial noises which prevail in most of our cities and is not considered as decidedly objectionable. In reducing noises, however, any steps which will curtail or eliminate the low-toned noises are in the right direction. Certainly a higher grade of maintenance which will give more attention to bearings and to worn conditions will result in other benefits to the car equipment as well as materially reduce the low-toned noises.

The high-pitched, bell-like tones which have great penetrating and carrying power are the second class of noises frequently found in gearing. These are extremely annoying and frequently can be heard for a square or more as the car approaches. This class of noise has been found to come almost exclusively from forged gearing, which has a bell shape, and it is seldom encountered in the spoke type of gear made from a steel casting. The latter, however, has become practically obsolete for railway cars.

I have made a large variety of tests in an effort to reduce the shrill ringing noise. These efforts have been confined principally to bolting blocks of wood or similar material to the gear or to packing some quieting material, such as cork or sawdust, against the gear. The use of such material has proved only partly successful. A few months ago I became interested in a rubber-asphalt material marketed by the Philip Carey Company for track installation. This was tried on gears in an effort to reduce the ringing sound. The first test was conducted on a test machine and in my own shop, with gears mated in such a manner as to generate the ringing noise. When pads of the rubber-asphalt material were bolted onto the webs of the gears the ring was almost completely eliminated. Observations, however, showed that the low-toned rumbling sound previously referred to was not particularly affected by the addition of the pads. After these preliminary tests, a particularly noisy crane installation was observed with its gearing operated in an exposed position. Noise from this crane could be heard for a distance of about two squares on a clear day. Elastite pads were attached and the noise was so reduced that it was noticeable only when standing directly beneath the crane.



Pads of Rubber-Asphalt Material Bolted to Web of Gear Have Been Found Effective for Reducing Gear Noise

In order to extend the tests to gearing in actual electric railway service pads of the Elastite were sent to a large number of railway companies that are making experiments in deadening car noise. Satisfactory results were reported in practically all cases. These tests are now being extended so as to include a large number of companies. I expect eventually to have some very interesting reports. Thus far the tests have been confined to cars which have been picked out for noisy gearing. When they have been brought into the shop for installation of the silencing material it has been found invariably that the gears were somewhat worn and that the noise primarily was a result of the wear. Application of the sound-damping pad shows that gears, even in their worn condition, can be operated without much objectionable noise. If the use of such pads will enable gearings to be continued in service for a longer time, this practice is certainly commendable. The pads are comparatively inexpensive and can be attached readily to any railway gear by bolting through the web holes.

An accompanying illustration shows a typical installation. Two pads appear sufficient to kill the most objectionable noises. They are bolted in the deep side of the web, care being taken to have the pad made so that it presses tightly against the rim and against the hub. Ordinary machine bolts are used with an arrangement so as to lock the nut on the pad side and with a fixed rectangular metal washer spot-welded to the head of the bolt on the back, in order to keep it from turning and from pulling through the web hole. In most cases these pads can be attached by merely dropping the gear case.

From the tests so far conducted it appears that only exceptional gears have sufficient ringing noise to need silencing pads when in proper condition. It would thus seem undesirable to put the pads on all gearings, but rather to carry a small supply in stock for use whenever a car is found in which the gears are exceptionally noisy and still not worn sufficiently to warrant replacing. The Tool Steel Gear & Pinion Company, which has been conducting tests, is not financially interested in the sale of the pads, but through the co-operation of the Philip Carey Company has been obtaining them without charge for railways interested in testing out their use. Inasmuch as the pads must be made to fit the contour of the web of the particular gear on which they are to be attached our engineering department has been working up drawings for such installations and is helping in every way possible to get the tests started.

Electric Locomotive Demonstrates High Overload Capacity

TO DEMONSTRATE the temporary high overload capacity of an electric locomotive as against a steam locomotive, the Chicago, Milwaukee& St. Paul Railway recently conducted some tests at Hyak, Wash., on the Cascade division of the Milwaukee's electrified line. For the purposes of the test, an ordinary bi-polar electric locomotive, having a maximum tractive effort of 137,000 lb., such as is used on passenger service on this division, was coupled to a type "C" steam locomotive, having eight driving wheels, and weighing with tender about 150 tons, and a Mallet compound, having twelve driving wheels and weighing about 278 tons.

In this test it was found that for short periods of time the electric locomotive pulled the steam locomotives backward against a full head of steam in both, without a rise in temperature in the motor windings sufficient to be damaging. This test was put on to indicate the extreme flexibility in operation of the electric locomotive compared to steam power, which is limited in pulling capacity to the pressure available in the boiler.

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Carhouse Remodeled as Garage

By Replacing Old Wood Roof Supports with Steel Beams and Installing a Concrete Floor the Dubuque Electric Company Has Secured a Roomy Structure for Bus Storage—Railway Car Inspection Pits Have Been Retained and New Equipment Added

By A. H. Smith
Railway Superintendent Dubuque Electric Company, Dubuque, Iowa

Entrance to the Garage Is Through an Adjoining Vacant Lot Which Has Been Graded and Paved with Concrete

WITH the inauguration of local bus operation in Dubuque on July 19, 1925, necessitating the purchase of four 25-passenger Mack buses, additional garage space was needed by the Dubuque Electric Company. Bus service was not a new thing to this company, however, as it has been operating buses between Dubuque and East Dubuque for the past eleven years. East Dubuque service was started originally with three electric buses. Owing to battery depreciation these buses were replaced by a fleet of Fords. Later this equipment was replaced by three Dodge-Grahams, which have been in service for the past two years. With only three buses and ten trucks to be cared for, garage space was ample. When bus service became necessary in the outlying sections of Dubuque not served by street cars and the additional buses were bought increased garage facilities were needed.

Instead of erecting a new building a section of the car storage house was remodeled for garage purposes. Dimensions of this building were 55 ft. x 250 ft. The original construction of the building consisted of brick walls with the roof supported by wood beams and posts between the tracks. The rear section was separated by a 12-in. brick partition. This space, 55 ft. x 141 ft., has been arranged as the garage. Aisle sprinklers, trolley wire and tracks were removed. Fourteen 10x10-in. upright timbers were replaced by seven steel girders. The old roof was replaced by asbestos roofing and a semi-collapsible door was installed on the south side of the building.

Adjoining this opening is a vacant lot, formerly used to store track materials. This was graded and paved with concrete. A rip-rap retaining wall was built at the end of the driveway on account of an incline rising at that point. A concrete curb was needed in another place to hold up an old wall on adjoining private property.

Near the entrance to the garage a 1,000-gal. gasoline tank with a Bowser pump of 5-gal. capacity was installed. Buses are filled with gas before entering the garage at night and immediately after entering are washed, serviced and stored along the wall. Four lighting standards constructed of pipe and containing 200-watt lamps spaced 30 ft. apart illuminate the driveway at night.

The interior is open for its entire length. Twenty buses can be accommodated in this section of the building. It has a concrete floor with two inspection pits, a work bench and a wash rack situated at the rear of the building. The old railway inspection pits have been retained and equipped with guards to keep the bus wheels from running over the edges. Nine windows with steel sash, seven on the south side and two on the north side, furnish ample daylight. Inasmuch as the garage is used principally at night, artificial illumination has been provided by means of sixteen 100-watt shaded lamps, vertically suspended from the ceiling.

Other equipment of the garage consists of an electrically operated spray washer, a portable air compressor for inflating tires and an Alemite grease gun. Ample electrical connections, both 110-volt and 220-volt, are provided for portable extension cords.

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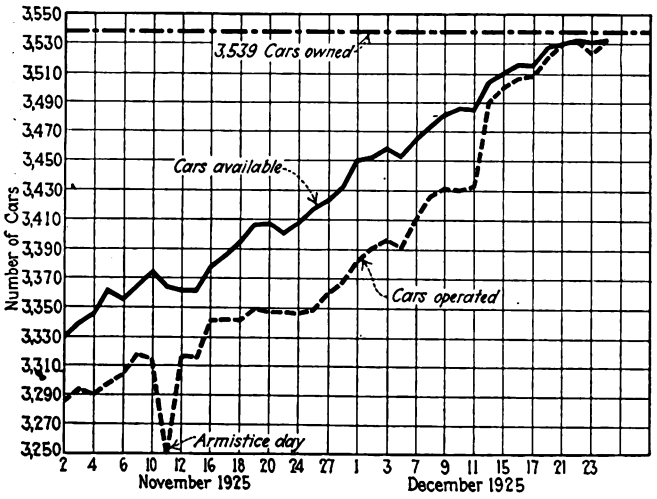
Rapid Overhauling Permits Maximum Holiday Service

On Two Days Last December the Chicago Surface Lines Operated 99.8 per Cent of All Passenger Cars Owned

BY H. H. ADAMS
Superintendent Shop and Equipment, Chicago Surface Lines

FORESEEING a heavy Christmas business, the executive officers of the Chicago Surface Lines toward the end of last summer started to make preparations to meet this condition by preparing the schedules required, providing extra men and getting the equipment in condition to meet the requirements. It was the duty of the shops and equipment department to supply the maximum number of cars for this service, and it was decided to stop all overhauling of cars at the two shops and to concentrate all available work on cars sent to the shops for damages.

Results obtained in the matter of service, in cars available and cars operated from Nov. 1 to and including Dec. 24, 1925, are shown in an accompanying chart. This shows that the margin between the number of cars available and the number of cars operated diminished gradually, until on Dec. 21, 22 and 24 the transportation department actually operated all the cars that the shops and equipment department had available. On Dec. 22 and 24 there were available and operated 99.8 per cent of the total passenger equipment owned. In other words, out of a total of 3,539 cars owned, there were available and operated on these two days 3,532 cars. From Dec. 14 to and including Dec. 24 there was available for operation more than 99 per cent of the passenger car equipment. This it is believed is a record which has



Ratio of Cars in Service to Total Cars Available on Chicago Surface Lines—Saturdays, Sundays and Thanksgiving Day Omitted

never been equaled in history for a property the size of the Chicago Surface Lines.

The curve does not include Saturdays, Sundays or Thanksgiving Day, as these days, of course, required a smaller number of cars for operation. It does show, however, a low point for Armistice Day, when the demand for extra cars was considerably less. The figures shown in this curve are taken in the afternoon rush maximum requirement period.

In order to have available for the maximum period the greatest possible number of cars, the work on overhauling cars began to slow down after Nov. 1 and no cars were taken into the shops for overhauling after that date. There were in the two shops on this date 90 cars undergoing overhauling, and in addition, there were 78 cars in for damage repairs, or a total of 168 cars in the two shops. This total was reduced to a minimum for one day of four cars. This was on Dec. 22, when there were in the South Shops three cars and in the West Shops one car. One of the cars in the South Shops was a car that had been badly damaged by fire and the two others were heavy damages that could not be completed. This was the case also with the one car in the West Shops.

At the carhouses during the month of October an average of approximately 36 cars were held in daily for repairs during the rush hours. This covers a total of sixteen carhouses, or approximately 2¼ cars per carhouse per day. In order to make as many of these cars as possible available for the maximum period, and after the work at the shops had begun to reduce, men from the shops were transferred to the different carhouses to assist in making repairs to the cars. This was particularly true in connection with the work on body repairs, with the result that many cases of cars having damage done to the body, were taken care of by this force so promptly that the cars were not out of service during the rush hours. There were cases where the front of the vestibule was demolished and the car was repaired and put into service the same day for the rush hours. Painting was taken care of by having vestibule posts and parts painted and kept in stock ready for installation when required.

During the week ended Dec. 19 and the four days immediately preceding Christmas, not including Saturday, Dec. 19, there was an average of only two cars per day held in for repairs during the rush hours at the sixteen carhouses. On Dec. 18 there were no cars held in at any of the carhouses during the rush period, showing the effective work that was done.

An increase of somewhat more than 40 per cent in cars overhauled will have been accomplished by the end of the fiscal year, Jan. 31, 1926, as compared with the previous year. This has been brought about by a change in policy in the matter of overhauling. Previous to Feb. 1, 1925, cars had been brought into the shop for general overhauling on a regular schedule, which averaged about 3½ years between overhaulings. After Feb. 1, 1925, cars were brought into the shop that had been out for the full length of their period, and these cars were given the general overhauling. In addition, cars that had been out for a period of two years were brought into the shop and given an overhauling. This last overhauling was much lighter than the general overhauling given to the other cars, due to the fact that less work was required on the cars. In addition to the fact that an increase of more than 40 per cent of the cars will have been put through this year, the average cost per car has been reduced about 45 per cent over last year's cost.

This more frequent shopping of the cars has resulted in a reduction in maintenance, and the electrical equipment has also been given additional tests and inspections, which have resulted in a marked decrease in the number of failures and an improved efficiency, all of which has resulted in the higher standard which enabled the equipment to meet the supreme test at the time of maximum demand.

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Ferry Car Solves High Water Troubles

Long Island Electric Railway Has Equipped a Special Motor Car and Trailer to Operate a Shuttle Service Through Flooded Section

Flooded Car Tracks Prevent Usual Electric Operation

ELECTRIC car service is kept on a regular five-minute schedule with water nearly 4 ft. above the rail with a special ferry motor car and trailer, constructed by T. V. Campbell, equipment engineer for Fisk & Roberts, in the Woodside shops of the New York & Queens County Railway. The section of track which becomes flooded after severe storms extends for some 500 to 600 ft. along Jamaica Avenue between 184th and 186th Streets, in Hollis, L. I. Ten to fifteen floods occur annually. During a recent storm the water was 42 in. above the running rail and flood conditions lasted over a period of five hours, in which the usual type of electric cars could not be operated.

This section has no sewers, and the three divisions of the railway which use the two tracks over this section have a five-minute headway. Before the special equipment was constructed it was the practice to operate cars up to the flooded section, where the passengers got off and walked to the next street north of the section and so around the flooded district. The water was so high that buses and automobiles could not operate through it and the inconvenience to the traveling public was quite pronounced. Receipts on these lines fell off from $100 to $125 per day as the result of decreased traveling. The flooded section was so situated that water would come from all directions, as there was not only a dip in the street itself, but the adjacent property on all sides was considerably higher than the tracks. The pavement outside the tracks is asphalt and granite blocks are used in the track area. The nearest crossovers to the flooded section over which cars can be changed from one track to the other is five blocks to the west and 26 blocks to the east. It is thus necessary to operate over a single track for a considerable distance when the street is flooded.

In order to provide transportation through the flooded district, the electric railway constructed a special motor car and used this in connection with a trailer to operate a shuttle service through the flooded section. The motor car has two motors mounted above the floor level and arranged to drive the wheels of the car through link-chain connections. The car used for this reconstruction was an old Taunton single-truck sprinkler car. This had 33-in. wheels and 6-ft. 6-in. wheelbase. The tank was removed and two G.E.-58 35-hp. motors were installed above the floor level. The gears which originally were on the axles of the car were installed on a countershaft and two sprocket wheels obtained from old sweeper equipment were also installed on these countershafts and on the truck axles so as to provide a link-chain drive between the countershaft and the axle.

Accompanying illustrations show the construction used. The countershafts are supported by pedestals at either end; bronze bushings serve as bearings. These were originally armature bearings from Westinghouse type 307 motors. The countershafts were made out of old axles, which had been discarded for worn journals. The gears are of a split type, which were easily mounted on a countershaft, and a keyway was milled in the shaft and a key installed to prevent turning. Lubrication for the countershaft bearings is provided by Galena oil cups taken from some old motors. The sprocket wheels are shrunk on the countershaft. It was necessary to bore these out to provide a larger diameter for the fit, and as the wall of the hub was quite thin, steel bands were shrunk over the outside ends of the hub so as to eliminate the danger of breakage when the sprocket wheels were forced into position.

The nose suspensions for the motors were constructed of 1-in. x 6-in. soft steel. Cross-members which provided the support for the motor were bolted to uprights,

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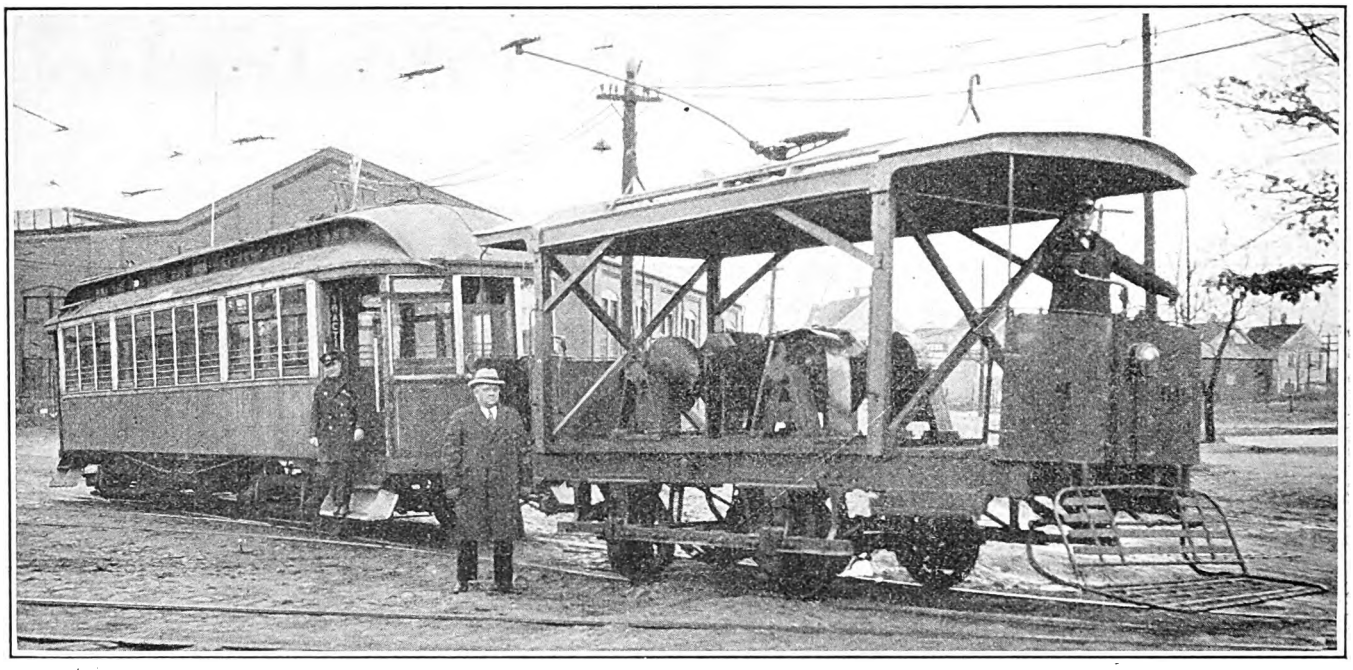


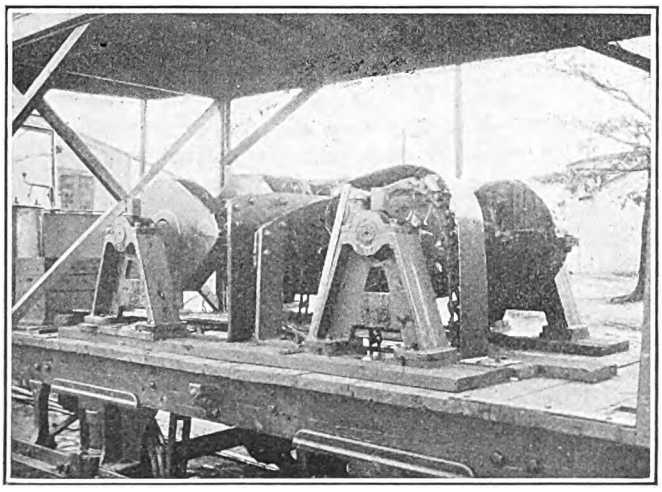
A Special Motor Car with Motors Mounted Above the Floor Hauls a High Platform Trailer

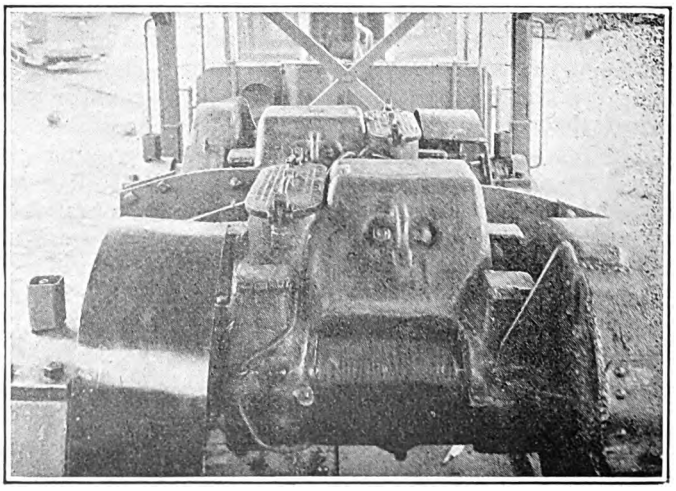
which in turn were bolted directly to planking above the floor. The resistors used in the motor circuit were placed at one end of the car above the floor level and were housed in a wooden box lined with transite. This box was perforated to allow the heat to escape. Protection was also provided over the sprocket wheels. This consisted of a sheet-iron guard, one end of which was bolted to the floor planking, while the other was connected to an angle fastened to the pedestals. The standard gear cases for the motors were used as a housing for the gearing.

The length of the motor car is 22 ft. 4⅞ in. over all and the roof construction consists of 2-in. x 1-in. rafters resting on ⅞-in. x 8-in. boards around the edge. The roofing consists of ⅜-in. white pine roof boards covered with 8-oz. canvas duck. The cross braces and end braces were installed to reinforce perpendiculars for supporting the canopy which were a part of the original construction. Two tarpaulin curtains 13 ft. 3 in. x 5 ft. 4 in. are provided for the sides. These roll up behind the letterboard. No curtains are used at the ends as they would obstruct the view of the motorman while observing passengers boarding and alighting from the trailer. The original draft rigging was reinforced so as to make certain that breakage would not occur, and as a further safety precaution a ¾-in. straight-link chain connects the motor car and trailer.

The trailer selected for this service has 33-in. wheels and double steps so that a high floor level is obtained. Cross and longitudinal seating is provided, which gives a seating capacity for 44 passengers. The trailer is 43 ft. 3 in. over all and has two Brill 27-FE trucks. The regular heating and lighting equipments of the trailer are used and connections are furnished through jumpers with receptacles from the motor car. A single five-light circuit lights the motor car.

This emergency ferry car and trailer is kept at a carhouse convenient to the flooded section, and as soon as inspectors report the water as rising so as to be dangerous to usual operation the emergency equipment is placed in service. The crew consists of a motorman for the motor car and a conductor for the trailer. In usual operation the passengers transfer directly from the ordinary cars to the emergency equipment, but where a delay occurs, emergency transfers are issued.





At Left—Standard Railway Motors Are Geared to a Countershaft. The Drive to the Axle Is by Link Chain and Sprockets.
At Right—The Sprockets and Link Chain Drives Are Covered with a Sheet-Iron Housing

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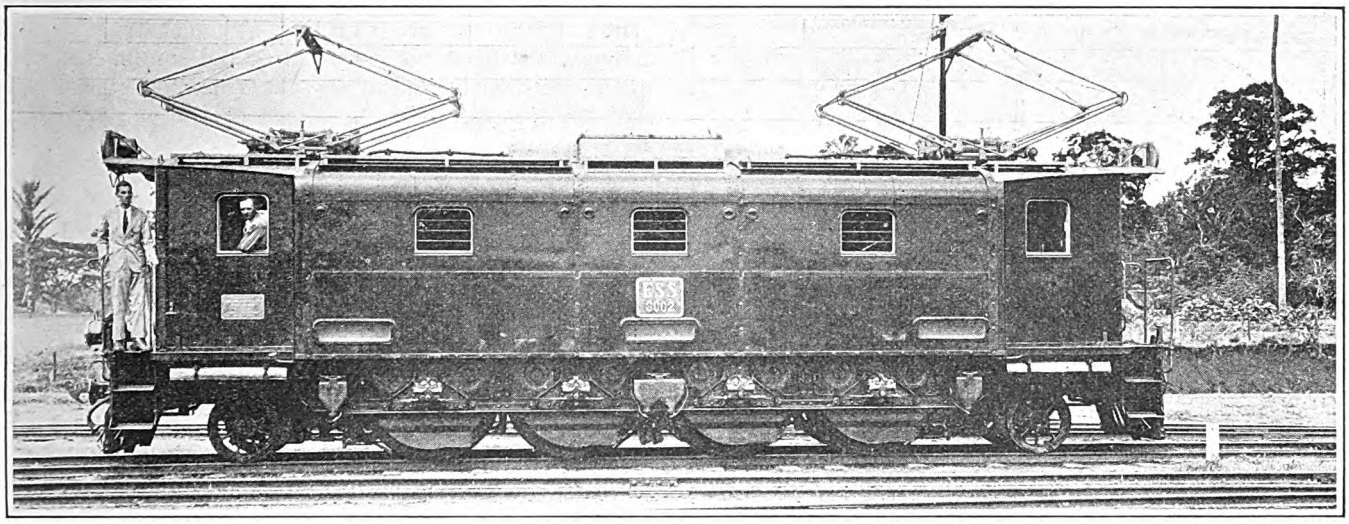
Java Starts Electric Trunk Line

Water Power Is Abundant and Coal Is Scarce—First Electrified Division of Dutch East Indies States' Railways Begins Operation on 50th Anniversary of the Day When Funds Were First Voted for Present Steam System

By C. F. Balsem

Railway Staff Dutch East Indies States' Railways,
Bandoeng, Java



This Is a 1,500-Volt Express Train Locomotive Built in Switzerland for the Java Electrified States' Railways

ON APRIL 6, 1925, the first section of the electrified States' Railways in the island of Java was opened with ceremonies and in the presence of a large number of the highest officials and the most prominent business men of Java. The day selected for the event was notable for other reasons than for the ceremony because it was the fiftieth anniversary of the day on which the first funds for starting railway building in Java were granted by the Dutch Legislative Council.

The idea of electrifying the Java States' Railways is not new. Years ago plans were drafted for extended electrification because of the excellent results obtained by the electrified sections of various steam railroads in Europe and in the United States. More than any other, probably, the success attained by the first trunk line electrification in Holland, from Rotterdam to The Hague, was urged as a reason for similar action in Java.

At the request of Ch. Engr. van Stipriaan Luiscius, managing director of the Java States' Railways, the chief of the western division of those railways, Engr. Damme, visited England, France and other countries in 1911 to study the latest developments in railway electrification. The result of this study was embodied in a voluminous report, warmly recommending railway electrification in Java.

The high costs of construction during the following years delayed the realization of Mr. Damme's recommendation. The development in 1916 on the Chicago, Milwaukee & St. Paul Railroad of high-tension d.c. distribution gave another impetus to the Java project. The great war also emphasized the desirability of electric traction, because of the scarcity of coal during those years. At that time the price of fuel went to very high figures, and the return of coal prices to pre-war standards seems very distant, if it should ever come. This experience proved the need, in the opinion of the Java railway authorities, of an absolute independence of every country in the matter of fuel for overland transport, especially in a dominion so far from its mother country as is Java.

WATER POWERS ABUNDANT

Fortunately, the island is rich in water powers whose hydro-electric possibilities were again studied. The opportunity with electric power of greatly reducing the number of employees per ton-mile run was also an important consideration. In consequence, in 1915 the former plans were again taken seriously in hand.

Engr. P. A. Roelofsen, now director of the department of government's industries in the Dutch East Indies, but then chief of the water-power division of that department, realized that the hydro-electric development for railway work should be part of a comprehensive plan for general power generation and distribution. By combining the needs of power in industry and in railway service it would be possible, in his opinion, to justify development which otherwise might have to wait many years for fruition. For this reason Mr. Roelofsen proposed in his report of 1917 a power development plan which would supply the industrial demand for electric power in the province of Batavia, and would also furnish the power required to operate the railways in and around the city of Batavia, the railway from Batavia

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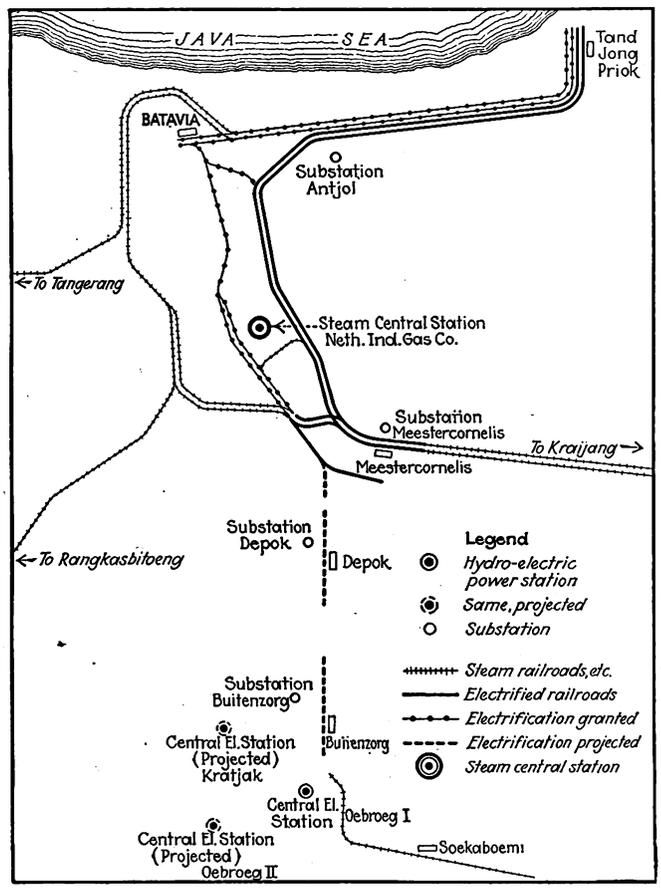


Map Showing Electrified Division About Batavia, Java States' Railways

to Buitenzorg, the Governor-General's residence in the mountains of Java, and the lines to Soekaboemi and Tjikampek. The necessary electric power for this plan was to be obtained from two hydro-electric plants.

These proposals were accepted by the government of the Dutch East Indies and approved by the home government. The construction of the two water-power plants was started in 1919 and the following year the States' Railways began the work of electrification. During the latter part of 1920 the railway part of the work was put under the direction of Dr. Eng. G. de Gelder, who had been sent out from Holland for that purpose.

The necessary energy was to be produced by two powerful hydro-electric plants, located on the Tjitjatih and Tjianten Rivers. The alternating current at 70,000 volts, obtained in those plants, was to be transmitted to the States' Railways' substations at Buitenzorg, Depok, Meester Cornelis and Antjol, there to be transformed to 6,000 volts a.c. At this voltage it was to be delivered to the States' Railways and to the substations for distribution to consumers of electric power and light.

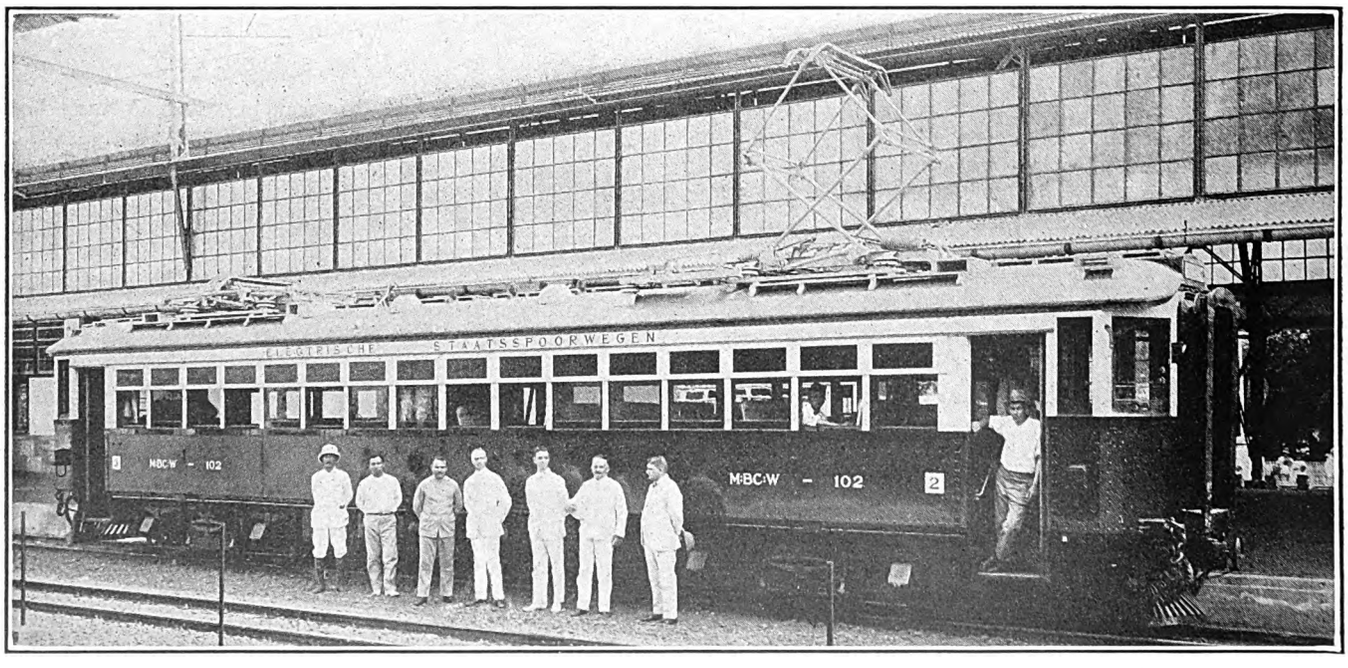
The water-power division was made responsible for the construction and operation of both the hydro-electric plants and the transmission line. The construction and management of the other parts of the equipment, such as the substations and of the electrification of the railway itself, were to be in charge of the electrification division of the States' Railways.

CHANGE IN PLANS NECESSARY

In 1921 all these plans were determined and construction had been begun, when the beginning of the general post-war financial slump compelled a change in the undertaking, and the Dutch government ordered a cessation of further construction. In consequence, the building of the central electric station on the Tjianten River, now called Kratjak station, was temporarily stopped. At the same time the electrification of the railway to Buitenzorg was postponed and the work on the rest of the electrical development in and around Batavia was slowed down.

These measures caused the postponement of the date of completing the first electrified section from the early part of 1923 to the end of 1924.

Under the changed plan the construction of Depok and Buitenzorg substations was temporarily abandoned, but the substations at Meester Cornelis and Antjol were already practically finished. The former substation has a capacity of 3,000 kw. in 1,500-kw. units, and the latter of 4,500 kw. in 1,500-kw. units, to transform the 6,000



This Is a Passenger Motor Car, Java States' Railways. The Second-Class Compartment Is at One End and the Third-Class at the Other

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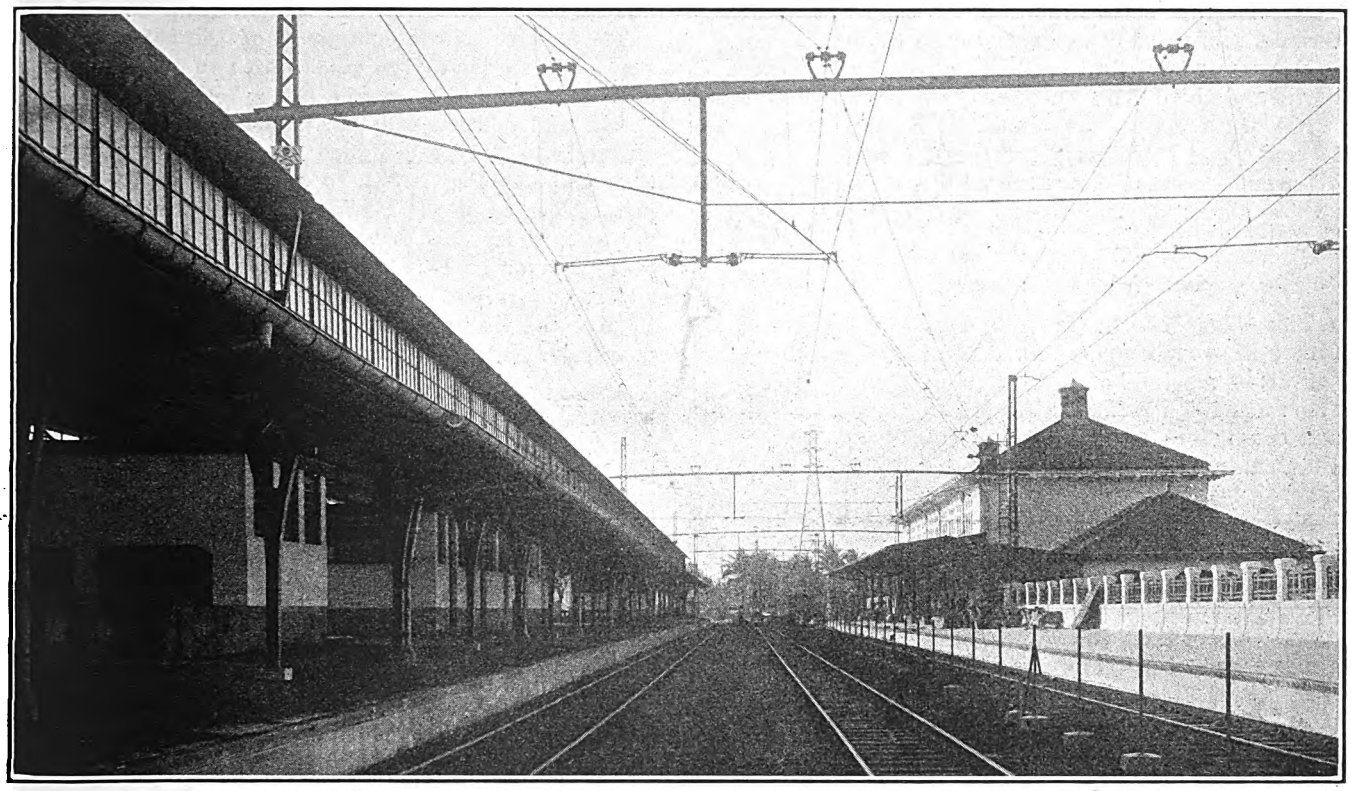

This Station Looks as if It Might Be in the Occident. Actually It Is at Pasarsenen on the Java States' Railways

volts a.c. to 1,500 volts d.c. This system was chosen as the most desirable for the States' Railways system. The Meester Cornelis substation was finished in September, 1924, and began operation on Dec. 3. Antjol followed in the following January. The equipment for the Meester Cornelis substation was supplied by the General Electric Company of New York and that for the Antjol substation by the Allgemeine Elektrizitäts Gesellschaft of Berlin.

Catenary Construction Used

The overhead contact system of the Meester Cornelis-Tandjong Priok division employs the catenary system with two parallel contact wires of 107 m.m² section and a copper catenary cable of 150 m.m² section. The Siemens-Schuckert works in Berlin supplied the overhead system complete, with the Enthoven foundry in Delft (Holland) as sub-contractors for the poles, many of which were made in Java.

The length of the electrified Meester Cornelis-Tandjong Priok division consists of 67.7 km. (42.3 miles) measured as single track. The total length of the lines composing the Batavia system amounts to 120 km. (75 miles) in all.

Rolling Stock

The electrical rolling stock consists of locomotives and motor cars with trailers. The latter supply most of the passenger service between Batavia and its harbor of Tandjong Priok. The standard train consists of one motor car and one trailer. The exception in the passenger service requiring the use of electric locomotives is in the transport of native coolies to and from their work during the rush hours in the early morning and the afternoon. This will be effected by means of trains of several passenger trail cars hauled by locomotives. Electric locomotives will also be used for freight service and to haul the through-express trains from the directions of Poerwakarta and Buitenzorg to the suburb of Weltevreden and to the city of Batavia, after their arrival at Meester Cornelis.

For the Batavia division twenty motor units were considered to be necessary. Ten of them were ordered from the Beynes Railway Carriage Works in Haarlem, Holland, and were electrically equipped by the General Electric Company of New York. The delivery of five other units, installed by the Westinghouse Heemaf Electric Works, was intrusted to the Koninklyke Fabriek van Werktuigen en Spoorwegmateriel at Amsterdam. Five other motor units will be ordered later.

The orders for the seven electric locomotives required were placed as follows:

Two express-train locomotives, type 1B-B1, 1,570-hp. capacity at a one-hour rating; maximum speed, 90 km.p.h., from the Allgemeine Elektrizitäts Gesellschaft in Berlin.

Two express-train locomotives, type 1A-AA-A1 of 1,500-hp. capacity at the one-hour rating from Brown, Boveri & Company in Baden, Switzerland.

Two passenger and freight locomotives of 1,200-hp. capacity at the one-hour rating and maximum speed of 60 km.p.h., from the Werkspoor-Westinghouse-Heemaf Company in Holland.

One freight locomotive, type AA-AA, 900-hp. capacity and maximum speed of 60 km.p.h., from the Allgemeine Elektrizitäts Gesellschaft in Berlin.

An order has also been placed for two accumulator switching locomotives with the Werkspoor Siemens-Schuckert Company. These locomotives will be of 360-hp. capacity with a maximum speed of 20 m.p.h.

Fares Charged

A zone-fare system is used on the Batavia Electric Railway. The total length of the line, 15.6 km. (9.75 miles), has been divided in three zones and the fares, expressed in American money, are as follows:

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For the first zone, first class, 10 cents; second class, 6 cents, and third class (natives), 3 cents.

For two zones, first class, 18 cents; second class, 12 cents, and third class (natives), 6 cents.

For three zones, first class, 24 cents; second class, 16 cents, and third class (natives), 8 cents.

Special trains to carry the mail are run once a week on the dates of mail boats leaving Tandjong Priok harbor for Europe.

MANY NATIVES AMONG EMPLOYEES

The wages of the train and station personnel are rather high as compared with those paid in Europe.

Station masters of European nationality receive as much as $300 a month in American money. Inspectors and conductors of European nationality receive maximum salaries of $120 and $80 respectively in the same time.

Native motormen and locomotive drivers are paid as high as $70 a month; conductors are paid a maximum of $28; signal men, $36; and switchmen, $13. Besides these payments, a system of premiums for efficient service offers the railway personnel an opportunity for a nice increase in their wages.

As a rule, Europeans are used in the more responsible positions of the staff and natives in those that are less responsible. It should be said, however, that in general the races of the Malay Archipelago, especially those of Java and Sumatra, are easily trained to be good railway men. This is especially true of work in the repair shops where the natives often become very skilled mechanics. Strikes are very rare and never general, and the spirit among the railway men, European as well as native, is generally one of contentment and satisfaction.

Reading Railroad Finds Gas-Electric Car Useful

SINCE being placed in service some time ago on the Trenton branch of the Reading Railroad a gas-electric car has been run approximately 16,000 miles. It gives frequent service between Trenton and Trenton Junction, the main line connection with New York-Philadelphia trains. The total run is 3.7 miles. The service is unusually severe as four station stops are made and operation at times is with a standard trailer. Grades are as steep as 1.1 per cent, but no auxiliary power unit is needed at any time.

Average schedule time for the one-way trip is ten minutes. Layovers at each terminal are from four to ten minutes in duration, giving a minimum round trip of 24 minutes. Without layovers the average schedule speed is 22 m.p.h. A total of 21 round trips is made on weekdays and 23 on Saturdays, giving an average daily mileage of 170. A 110,000-lb. standard steel coach is handled on three of the round trips. This car also handles the switching of express cars at Trenton and the transferring of one 73-ton express car from Trenton to a main line train at the junction.

This gas-electric car has replaced two class Q-1, 2-6-4 type steam locomotives and one coach. The locomotives were of special design for operation in either direction and in normal service ran around the cars, as the layover time at each terminal was inadequate for turning on a wye. For normal operation of the car no extra movement is necessary as the control is arranged for operation from the rear end and unless a trailer is hauled the operator can run the car from the rear end.

The motive power equipment of the car consists of a gasoline-engine-driven generator, two motors and control apparatus. The engine has a 7¼-in. bore and 8-in. stroke and delivers 250 hp. at 1,100 r.p.m. The generator is of a type designed especially for gas-electric cars and supplies power to two 140-hp., 600-volt d.c. motors located on the forward truck of the car. Motors are axle hung and drive through strong solid helical gears, having as 16:61 ratio, which are totally inclosed and run in grease. This large gear reduction was used to give the high tractive effort necessary with trailer operation. Speeds up to 51 m.p.h. have been attained.

The Readers' Forum

The Noise Reduction Committee's Position

DEPARTMENT OF STREET RAILWAYS
DETROIT, MICH., Jan. 27, 1926.

To the Editor:

In the Jan. 23 issue of ELECTRIC RAILWAY JOURNAL "Master Mechanic" criticises the work of the noise reduction committee and administers a dose of cold water to the new committee which is to study means of improving appearance and comfort of cars.

While it is true that the report of the noise committee did not stir up much discussion on the floor of the convention, yet that is not conclusive proof that the committee's work was futile. As chairman of that committee I have received several letters from railway officials making further inquiry and indicating that they are giving deep study to the subject. Several roads are experimenting along the lines suggested in the report. On one road, to my personal knowledge, something like $15,000 has been spent during the past four months to overcome noisy conditions in car equipment. This shows conclusively that noise reduction is a very live problem.

Your correspondent speaks of "theorizing" by the committee. In defense of the committee's work I would like to call attention to the fact that its work and report had to be completed between January and June, or in a period of less than six months. Inasmuch as the committeemen must of necessity superimpose this work on their other labors, they cannot hope to prosecute the task as diligently as though they were free to confine themselves to the one subject. It was felt by the members that if they could present to the association a comprehensive study of the underlying principles of the problem and a summary of all known causes with their possible remedies a good foundation would be laid for further work. It is believed that our report did accomplish that purpose, and that while many of the remedies remain to be proved, there are others that are too obvious to require proof. It is the intent of the committee to conduct research work during the present season so that it may submit in its next report definite results free from the taint of "theorizing."

The other question raised—expense—is one that is being given considerable attention. There are several aspects to this phase. In the first place what will it cost? Unfortunately that cannot be definitely settled, as conditions vary so greatly on different properties. It is the consensus of opinion, however, that whatever

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steps are necessary to reduce noise in car equipment, it will call for some initial investment, but ultimately the maintenance costs will be reduced due to the use of higher standards. Secondly, quiet cars have a better sales value, and if car riders are to be won back to the electric lines this becomes a very tangible asset.

The committee hopes to supply the Aladdin's lamp. It will be in the form of facts and figures which will give the equipment man the needed arguments to prove to his manager the results which can be obtained. On the other hand, the equipment man must do his bit. This will consist of application of the findings to his own property and keeping up a continuous barrage of reports until he sells the idea.

H. S. WILLIAMS,
Chairman Noise Reduction Committee A.E.R.E.A.

Small Roads May Create a Large Market for Modern Cars

BEAVER VALLEY TRACTION COMPANY
NEW BRIGHTON, PA., Jan. 23, 1926.

To the Editor:

Your issue of Jan. 16 was of particular interest to me, having just returned from a meeting of the merchandising transportation committee held in New York. In this number there were five editorials dealing with car equipment. Our committee considers that the car is the show window of our industry.

It is inspiring to note in the recent issues of the JOURNAL the prominence given to the proposition of replacing obsolete electric railway cars.

Recently a small railway company held a meeting of the department heads to discuss specifications of several new cars that were to be purchased. At this conference the question was asked whether it would be possible for the car manufacturers to furnish a unit that would contain comfortable seats and the body so designed that the eye would not be offended with the awkward looks of platform and other equipment. This is just one concrete example of the appreciation of electric railway employees that there is a growing demand for a car unit which will be a better merchandising unit. Undoubtedly the manufacturers will bring out new designs to meet this demand.

A combined purchasing power, perhaps beyond present realization, may be possible among the smaller companies alone when the greater earning power of a modern ride-inviting car is thoroughly demonstrated.

Your recent articles and editorials on this subject certainly have made interesting and inspiring reading.

CLINTON D. SMITH,
General Manager.

Buses Faster than Electric Cars in New York

NEW YORK, Jan. 25, 1926.

To the Editor:

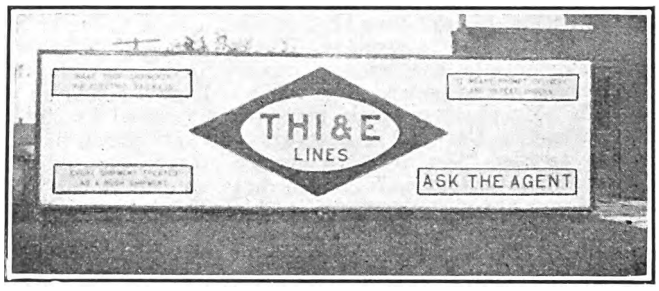
Some of your readers may get a wrong impression from the short article in your issue of Jan. 9 entitled "Cars Faster than Buses in Test" and believe that as a rule better time is made by street cars in Manhattan Borough, New York, than by the buses of the Fifth Avenue Coach Company. The period selected for the test was between 5 p.m. and 6 p.m. on a single day during December, when Fifth Avenue was crowded with shopping traffic for a large part of the section chosen for the test; i.e., that between Fourteenth Street and 57th Street. It is perhaps only to be expected that buses on Fifth Avenue, when it is crowded with Christmas shopping traffic, will make slower time than electric cars on Third Avenue, which run on what is almost a reservation in the center of the street, because of the elevated pillars on each side of the car tracks.

That street cars on the average make better speed on Manhattan Island than buses is not correct. One has only to turn to the reports of the New York Transit Commission and determine the vehicle speeds of the different companies, including layovers and delays, by dividing the vehicle-miles by the vehicle-hours. These for the year ended June 30, 1925, show the following for the surface cars: New York Railways, 6.6 m.p.h.; New York & Harlem Railroad, 6.8 m.p.h.; Third Avenue lines below the Harlem River, 6.6 m.p.h. During this period, however, according to the same method of calculation, the buses of the Fifth Avenue Coach Company in Manhattan Borough operated at an average speed of 8.1 m.p.h., or were considerably more than 1 m.p.h. faster than the average for the cars of any of the surface systems mentioned. TRANSPORTATION.

Uniform Signboard Advertising on Main Highways

BY D. H. WALKER
Assistant Engineer Terre Haute, Indianapolis & Eastern Traction Company

AT SEVERAL locations along main arterial highways the Terre Haute, Indianapolis & Eastern Traction Company has erected large signboards advertising its service. The majority of these signs have been placed on carhouse or power house property, but some are simply on the right of way at junction points of main highways or near towns. Signs are placed at a sufficient distance from the road to make them clearly visible to passing vehicular traffic. Since all the signs



Typical Advertising Sign of the T. H., I. & E. T. Co. Along the Jackson Highway, Which Runs from Chicago to Florida

are placed on company property they bear no rental charges. In some instances they have been so located that they may be seen from passing interurbans, but the governing factor has been to make them seen by the occupants of passing vehicles. Lighting at night has been tried on some and will soon be installed on all.

Signboards are made 12 ft. high and 30 ft. long with a large diamond emblem of the T. H., I. & E. lines painted in the center. In the four corners are hung boards 2 ft. x 10 ft., which carry the various advertising messages and slogans. The boards are changed at regular intervals and new advertising substituted. All work in connection with erection of signboards and changes of advertising is done by company forces. Messages stress the speed of freight handling and the convenience of fast limited and local passenger services. Pertinent facts concerning the electric railway industry as a whole, and the Middle Western lines particularly, are also placed on the boards.

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Association News & Discussions

Improvements for All Departments Discussed by New York Association

Papers Were Presented on Painting, the Use of Buses by Electric Railways, Co-operation of All Departments, Safety, Training Future Executives and Economical Practices—Annual Dinner Important Feature of Program

PROVIDING attractive, up-to-date equipment and improving all departments was the keynote of the mid-winter meeting of the New York Electric Railway Association held at the Commodore Hotel, New York City, on Jan. 27. In his opening address President William J. Harvie reviewed the progress that electric railways have made from the horse car days and discussed briefly the coming of the bus into the general scheme of transportation and its rapid advance in use. Attractive, up-to-date equipment designed for comfort rather than luxury was pointed to as a desirable result to be obtained. An abstract of Mr. Harvie's address appears in other columns of this issue.

Present-day practices in car painting were given in a paper by Samuel S. Demarest, abstracted elsewhere in this issue. Following the presentation of the paper Mr. Demarest gave some detailed costs of applying the three systems of painting referred to. These costs substantiate the general statements given in the paper.

E. A. Murphy, general manager United Traction Company, Albany, read a paper entitled "Destroying a Service Which It Cannot Replace." An abstract of the paper appears elsewhere in this issue. Discussing Mr. Murphy's paper, George MacLeod, vice-president and general manager Buffalo & Erie Railway, Fredonia, described the operating and fare collection methods employed by this company. He said that experiments are being made with an auxiliary magnetic brake.

The question was asked whether any of the railway men in the audience knew of an instance where the bus had been successful in handling mass transportation. Mr. Murphy replied that experience in Albany indicated that the bus could not handle mass transportation. He mentioned the desirability of having buses of larger carrying capacity than the 29-passenger vehicle now used in that city, but stated that overhanging trees prevented the use of double-deck buses. Experiments are being made with an eight-wheel bus, he said.

Successful use of a weekly pass on the West Penn Railways as a means of solving the fare collection problem with one-man cars was described by Walter Jackson, consultant, Mount Vernon. In regard to speed, Mr. Jackson pointed out that the double-deck bus is inherently a slow vehicle.

"Internal Co-operation" was the subject of a paper presented by C. P. Segard, assistant secretary Third Avenue Railway System, New York City. A paper, "Potential Executives in the Rank and File," by R. E. Danforth, formerly vice-president and general manager Public Service Railway, New Jersey, was read by Martin Schreiber, manager southern division Public Service Railway, in the absence of Mr. Danforth. "Points on Which City and Traction Officials Should Agree" was the subject of a paper by W. P. Capes, director New York State Bureau of Municipal Research. No discussion followed the presentation of any of these three papers. Abstracts appear elsewhere in this issue.

Barron G. Collier had been unavoidably detained out of town and was unable to write a paper.

Alfred T. Davison, general counsel Third Avenue Railway System, delivered a talk on accident prevention as practiced by his company.

Education before the accident occurs rather than discipline afterward is the plan on which the recent work of the Third Avenue Railway System has been conducted. For two years this company has filed all of its accidents on the seven-point system. The record of each accident is written with six carbon copies, which with the original make seven, and these copies are filed under the seven different classifications which might serve later to identify them. One record is under the name of the party injured, the second under the address given, third the date, fourth the line on which it occurred, fifth the car number involved in the accident, sixth the motorman involved, and seventh the conductor involved. Periodically a statement is made up showing the location of all accidents.

An analysis of the accidents shows that in 25 per cent of the accidents the company was at fault, and in 75 per cent the company was not at fault. The efforts of the company are directed toward reducing the 25 per cent of accidents at fault, and attempting to prevent recurrence of accidents falling in the 75 per cent class, and at the same time educating the operating department so that the claim department will have sufficient witnesses and other data that will aid in preventing payment of money if the cases come to court.

The company often pays large sums of money in settlement of accident claims falling in the 75 per cent not-at-fault class, because proper witnesses were not obtained, and trainmen are impressed that they are responsible not only to reduce accidents but to protect their company in connection with all accidents whether they are in fault or not. The company is also trying to impress trainmen that often serious accidents may result from apparently trivial things. A car that is allowed to roll only a few inches after the doors are opened may cause a serious accident to a feeble person who may be boarding or alighting.

The latest effort of the company to analyze accidents was started in November. Due to this work the serious accidents have been materially reduced. For the three months August, September and October of last year the serious accidents on this system averaged 1,719, whereas for November and December they averaged 1,632.

An interesting point used to prevail upon the trainmen and operating forces is that the company is now paying out twice as much money for accidents as it did ten years ago, and that the same care applied now as ten years ago would save from two to three times the amount of money.

Following Mr. Davison's talk, the question was asked from the floor as to how the company informed the men relative to the statistics of accidents, to which Mr. Davison replied that the road instructors, road men and superintendents must attend the weekly conferences, when they and others analyze the accidents. These officials then take up the analysis with the trainmen, and in this way carry much information directly to the trainmen.

To the question asked by President Harvie as to what effect this work is having on the 75 per cent of accidents not at fault, Mr. Davison answered that this could not be determined for perhaps a year, as it took at least this amount of time finally to dispose of cases that may be brought to trial. The answer would be the amount of money the company had to pay out in the settlements as compared to years prior to this work.

Charles H. Clark, engineer in charge of maintenance of way Cleveland Railway, then presented seven reels of moving pictures which illustrated many features of interest in the operation of his company. First his audience was permitted to take a ride down Euclid Avenue on the top of one of the Cleveland Railway's six-wheel double-deck buses. Surviving this experience safely,

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they then were conducted through the extensive maintenance and production shops, where many of the labor-saving devices developed by the engineers of the company were in operation.

A trip to various sections of the right-of-way was included in order to illustrate the methods employed in track and pavement construction and in general roadbed maintenance.

Several of the reels were prepared specially for showing at this meeting, while others were taken previously. Following the showing of the pictures, President Harvie declared the business session adjourned.

The dinner meeting scheduled for 6:30 convened shortly after, and was eminently successful. Edward F. Wickwire, vice-president of the Ohio Brass Company, Mansfield, Ohio, talked on "The Jollying Trolleying Public." The paper was filled with similes presented in the inimitable style for which Mr. Wickwire has become famous.

John A. Ritchie, president Yellow Truck & Coach Manufacturing Company, followed with a paper on "The Place of the Motor Bus in Co-ordinated Urban Transportation." Abstracts of both of these papers appear elsewhere.

The dinner was interspersed with good entertaining features and closed with a talk by Strickland Gillian, a humorist of note.

During the day the meetings were well attended and 437 members and guests attended the dinner.

What Type of Equipment Will Attract Patronage?*

BY W. J. HARVIE
Vice-President and General Manager Auburn & Syracuse Electric Railroad

DURING the time this association has been in existence we have witnessed many new developments in transportation methods. We are witnessing other developments in the methods used in public transportation, and we must not close our eyes to new requirements, both actual and fancied, as they present themselves.

Fundamental during all this time have been two thoughts, attractive, up-to-date equipment and economical operation. Great progress has been made along both of these lines in so far as those factors were concerned over which we had control. We have undertaken to meet changing conditions as they arose and as new needs and habits became apparent.

Many of you will recall a time some years ago when our sole idea seemed to be to operate electric cars which in the light of later experience were far too heavy. Within a period more recent we were installing on our lines the very lightest possible equipment, and were listening to debates regarding the cost per annum of carrying the weight of the paint which we applied to our light equipment; certainly an amazing example of going from one extreme to the other. Neither type of equipment was satisfactory; both were the result of a sincere effort on the part of railway operators and investors to furnish, in the first instance, what was then termed attractive, and even luxurious, equipment for the use of our public, and in the latter instance an effort to furnish attractive, though not luxurious, service, the main object being to reduce to the lowest figure the cost of furnishing that service. Both of these efforts were commendatory, but, in the light of experience, both went too far.

Some time just prior to 1922 a new form of transportation, the motor bus, began to make itself known. Its presence was not seriously noticed at first, but our public received it well, and it soon began to gain in popular favor. Its influence on our industry was not great, for in 1922 the bus carried but one-tenth of 1 per cent of the number of passengers carried on the electric cars. However, this small percentage amounted to more than sixteen million persons, and, as you know, the number has been increasing since that time.

We are then once more facing a new condition; not a complete transition from one form of transportation to another form, as before, but a partial transition and a revamping of our methods, so that by the addition of the bus we may furnish a more complete and more extensive transportation service than was possible before.

Our danger is that some of us may feel that we are facing a complete transition in existing transportation facilities and the consequent general disappearance of electric cars, and, indeed, some of our citizens do think so. I do not share this thought, for as long as large numbers of people desire to be transported by a public conveyance from place to place at about the same time, or continuously for a period, the electric car will be the most expeditious method by which it may be accomplished.

The fundamental need of the traveling public is the same today as it always was, although we are inclined to lose sight of that fact when we view around us the increasing tendency of our public to provide its own individual transportation service. This method we know to be the most expensive for the individual, and, from the community standpoint, most uneconomical of street space.

What is the type of equipment with which to attract patronage? It seems to me that the equipment should be what may be described as comfortable, not luxurious. So-called de luxe equipment is quite another matter, and rightfully calls for an extra charge. The question of size of units and headways should fit the needs of the public which is to be served. The equipment selected must, of course, be adaptable to highly economical operation. These considerations are of prime importance and are of equal force whether applied to electric street cars, buses or other means of public transportation.

Present-day conditions make it necessary for us to take stock of ourselves and our industry and, having in mind the fundamental needs, adapt our equipment and methods to present-day ideas of good service.

Let us not imagine that supplying plush seats with double cushions and putting tapestry curtains at the windows will suffice to increase permanently our present patronage or to win back lost customers. The average user of the electric railway does not seriously care for such refinements. If he can ride in reasonable comfort and reach his destination quickly he will be quite satisfied that he has full value for his fare. Neither do I think the average citizen cares what colors or decorations we use on our cars or buses so long as they do not offend the eye.

Consider your investments in equipment in the light of common sense and good judgment. Meet changing conditions with the right perspective. Do not permit good judgment to be warped by the present tendency to furnish de luxe service where only plebeian returns are possible, nor go to the other extreme of furnishing less than a comfortable ride to your passengers for economic reasons, and then expect your public to give you its support.

*Abstract of paper delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Feb. 4—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass.

Feb. 5—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8 p.m.

Feb. 8-11—American Institute of Electrical Engineers, midwinter convention, 29 West 39th Street, New York, N. Y.

Feb. 11—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.

Feb. 18—A. S. C. E., A. S. M. E., A.I.E.E. and A.I.M.M.E., joint meeting, Engineering Societies Building, New York, N. Y., 8-15 p.m.

Feb. 24-26—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11—Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa Okla.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

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Present-Day Car Painting*

By Samuel S. Demarest
Pratt & Lambert Company

FOR exterior car painting, be the surface wood or metal, there are three standard methods of application in vogue today. The first operation in car finishing or painting, after thoroughly cleaning the surfaces to be decorated, is priming. The priming coat may be applied by brush or spray and the material or primer used may be clear or it may contain pigment. In any event, whatever form of primer is used, on wooden surfaces it should be well worked into the surface. Many painters insist on white lead and oil for priming over wood; this practice is sound but not essential, for there are many long oil primers on the market today which insure equally efficient returns. Primers for use over metal surfaces, in the estimation of many authorities, should contain certain rust preventing or retarding properties; that is, be made up with admixtures of pigments such as red lead, blue lead or red oxide of iron; again, satisfactory results are shown where clear primers are used directly over the metal. Primers provide the base upon which the succeding coats depend. They must of necessity be long in oil in order to give the maximum of adhesion and provide proper elasticity.

Surfacing coats follow the priming operation. They provide a workability for sanding or rubbing, which creates a smooth, flawless base, ready for the finish coats. Surfacers are supplied in knifing and brushing consistencies. Knifing coats, which fill and hide all minute indentations or abrasions of the wood or metal, are applied with a putty knife. Brush-coating surfacer may be applied by brushing or spraying. There are no fixed rules as to the number of surfacing coats required; this depends solely upon the condition of the surface being treated and the fineness of the ultimate finish desired. Surfacers in their make-up should be short enough to insure being rubbed or sanded smooth without arduous labor and yet long enough in oil to prevent absorption of color coats and to allow for the contractive and expansive action in metal car bodies without disintegrating. All large holes or depressions in wooden or steel bodies are filled with putty or some kindred product in between the surfacing coats.

When flat colors, known as colors in Japan; car body coatings or enamels are used directly over the surfacing coats in order to obtain certain color schemes and these are followed by varnish coats, the plan of finish is known as the color and varnish system. This generally consists of one or two coats of color body applied directly over the smoothly rubbed or sanded surfacer, followed by one coat of rubbing varnish and one or more coats of finishing varnish.

Where one or more coats of long oil enamel follow the surfacing operations the system is known as an enamel system. The lacquer enamel system consists of the spray application of two or more coats of lacquer into which color pigments have been incorporated, over especially adapted primers and surfacers applied as above.

Due primarily to savings in labor costs, accounted for by its demands for a minimum number of coats, the enamel system represents the most economical method of exterior car finishing in use today. The color and varnish system stands second in this comparison and is about midway between the enamel and the lacquer enamel systems, the latter of which is the most expensive on original application. Many manufacturers feel the time is not far distant when increased production of lacquer enamels will bring the costs of these materials down to a level where the lacquer enamel system will prove the most economical from an original application standpoint of view.

Expressions as to time required for car shopping for painting vary slightly. The lacquer enamel system in our estimation now provides the fastest schedule of car finishing and this schedule will doubtless be reduced as new products going into the make-up of the system are developed and application methods for the materials themselves are perfected. The enamel system follows closely the lacquer enamel system in this connection, the color and varnish system standing last.

For sheer downright beauty and appearance of finish the color and varnish system, for a time, undoubtedly excels other systems in the sight of the most exacting. The high luster imparted to car bodies through the final coats of good finishing varnishes bespeaks a newness and cleanliness appealing to many operating officials. Comparative ease of cleaning and weathering, however, soon dim this first high luster and the sheen of the finish continues to go backward throughout the life of the job.

Several manufacturers of enamels have more recently incorporated into their products a luster which enables them to give a finish in their enamel systems vying closely with that obtained through the use of the color and varnish system. In the instance of the enamel system the luster of the final coatings recedes very slowly, and in a relatively short time, under identical conditions, the sheen of the finish secured through the use of the enamel system surpasses that given by the color and varnish system. The enamel system presents a surface readily cleanable if the proper cleaning compounds are used. The lacquer system now offers, in appearance, what is known as an eggshell finish. Surfaces to which lacquer enamels have been applied are, in most cases, easily cleaned with practically any form of cleaner and the finish itself picks up added luster through continued washing.

The color and varnish system lends itself readily to the various forms of striping, lettering and numbering, and especially is this so where that work is done in gold or aluminum leaf. Gold and aluminum leaf must be varnished, if only pencil varnished, for protection against the elements, all of which means extra operations where the enamel or lacquer enamel system is used. To offset this feature imitation gold and aluminum enamels have been developed for use in striping, lettering and numbering over enamels and lacquer enamels.

Refinishing costs in connection with the various systems of car painting are the issue commonly overlooked by operating officials in selecting a desired type of finish, and yet they represent almost as important a factor to the railway company as does the original combination applied to the car. If cars painted with the color and varnish system are not left on the road too long, they can in many instances be brought back to practically their original appearance through the application of but one coat of finishing varnish; this plan would frequently necessitate taking cars out of service for painting alone instead of refinishing only at the time of general car overhaul.

Where the color and varnish system is allowed to deteriorate too far it is an expensive system to employ from a refinishing point of view. The enamel system can be brought back to its original appearance at the time of car overhaul, through the application of but one coat of enamel directly over the old finish.

On first development, lacquer products bore so much of promise toward that goal of speed and endless service that enthusiastic sales representatives oversold themselves on it and they, in turn, oversold their ideas. Multicolored cars have in a measure been a stumbling block for lacquer application. Lacquer, thus far, has shown a tendency to serve better on exterior metal surfaces than on wood, its supposed highly inflammable composition leading it to be discarded by some without second thought. Some tried it and in certain instances it failed.

*Abstract of paper delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

Destroying a Service Which Cannot Be Replaced*

By Ernest Murphy
General Manager United Traction Company, Hudson Valley Railway Company, Capitol District Transportation Company, Albany, N. Y.

BUILDERS of the program for this meeting were almost as generous as the grizzled veteran in the colored congregation. The new minister had asked him to select a text on which he could speak, whereupon he pointed to the sentence, "This is the beginning and the ending."

Taking for granted the bare, broad statement that the automobile and the automobile riders have cut enormously into the earnings of the street railway companies, causing in many instances lines to be operated at a constantly increasing loss, the question naturally arises: When is the automobile used for pleasure and when is it used for business? Is it used for business when

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the owner rides to work in the morning, picking up a number of friends who might be prospective street car passengers and then leaves his car parked all day to obstruct normal traffic, so that it must move in a 16-ft. lane left between parked cars? The delays caused by traffic congestion in city streets due to parking is a problem felt by every operator in cities large and small.

Our own experience has been to review completely the several lines as to earnings, expenses and reconstruction costs, and where the reconstruction costs were such that the operating revenue did not warrant a reproduction in kind of the structures, the trolley lines were abandoned and buses substituted. Since the installation of our first bus operation, experience has proved that the buses hold the passenger traffic and in some instances apparently induced additional traffic over the lines.

Use of the double-deck bus in Albany was practically prohibited by overhanging trees, so that the 29-passenger single type was adopted. However, on certain lines it would be desirable to have a vehicle with a larger capacity for operation during the morning and evening peak loads.

The popularity of buses over the trolley cars is quite evident. The traveling public seems to be better pleased with riding on rubber wheels than on steel wheels and rails. There is no question about the fact that transportation by bus is quicker, and the people get to and from their work in less time than they did by the trolley lines which have been abandoned. It is unquestionably safer, because of the manner of boarding and alighting from buses as compared with the trolley car. The operation cannot be suspended by obstructions on the street.

The people today would not go back to the old sailing vessel for transportation; nor to the horse car. With care exercised by a railway management as to lines which could better be operated by the substitution of bus transportation, our experience tells us that such substitution is justifiable.

Internal Co-operation*

By Christian P. Segard, M.D.
Assistant Secretary Third Avenue Railway, New York

MANY of the lessons that we wish to mark indelibly on the juvenile mind of today are learned, not in the schoolroom, but on the play field. Perhaps the most important rule of all games in which more than one individual takes part is the unwritten law of team work. And team work of whatever kind, whether in games or in industry, requires as its counterpart, knowledge. The word co-operation might be substituted for team work.

Let us examine some of the causative factors of non-co-operation.

1. A lack of knowledge of the whole and the purpose of its parts leads to non-co-operation. The man whose job is fitting a bearing or setting up some bolts can never have the same interest in the completed product as the man who in former days did almost the entire job and in addition tested the product and saw it work.

2. The highly trained specialist who has devoted all his time to the study of one particular phase of industry naturally shows less interest in industry's other phases. It seems that the specialist has broadened his basic knowledge of one particular phase at the expense of his interest in all other phases. Interest and knowledge of the component parts of industry beget co-operation.

3. Many times the common objective of the whole is replaced by a lesser objective of one of the parts. In our anxiety to excel within a department we may throw a great burden on some other department far outweighing the excellence gained.

4. An unwillingness to accept suggestions or information when offered. The least we can do when a suggestion is made or information offered is to accept it with the same degree of interest that inspired it.

5. And last but not least we have the most interesting if not the most common cause of non-co-operation and that is the characteristics of the human being himsef. Human weaknesses such as self-interest, jealousy, fear and intentional non-co-operation should probably head the long list.

Methods to Secure Co-operation

We can't just talk about co-operation, we must lay down some few methods by which it can be accomplished. The following are ten factors involved in securing co-operation:

1. The common objective of the whole is the most important factor. Unified effort to attain this common objective is essential to growth. No one individual and no one department is of more importance than another. The individual and the department are each an integral part of the whole.

2. Information. How often have we heard the statement, "Why didn't I know this before?" meaning, "why didn't I get information?" Many a good piece of equipment and many a sound proposition has failed because of failure to co-operate with the forces that were directly concerned with making the proposed change an unqualified success.

3. Suggestions whether verbal or written are one of the means by which we understand that the individual is trying to co-operate. Very frequently we find that a suggestion may come from an entirely unexpected source and refer to something entirely outside of the department. Anyone offering any suggestion for the good of the company is entitled to our respect and a hearing. He is showing his willingness to co-operate.

4. To attain co-operation it is necessary that there be mutual respect. Without respect for our associates, superiors and organization, we certainly cannot secure harmony, efficiency or co-operation.

5. If we cannot effect co-operation we may be able to effect compromise. Two departments were using the same expensive material, but of a different quality. The difference was small, yet it was necessary for the storeroom to stock both qualities. One size could have been completely eliminated had these two departments been willing to compromise on one quality which could easily have been used for both jobs. The purchasing agent and storekeeper could frequently show us where a saving could be made if slight differences in size and quality specifications were eliminated.

6. How very often have we found in our own experience that we are very human in our willingness to receive approbation and yet so very unwilling to give our approval to those associated with us. This is a most inconsistent form of human weakness and can only be overcome through conscious effort. Exceptional effort is entitled to commendation just as mistakes require criticism. Commendations need publicity, criticism must be private.

7. Inter-departmental co-operation. How often have any of us gone to another executive or department head and said plainly, so there could be no misunderstanding," "How can my department co-operate with yours?" Unless we ourselves invite co-operation it is unreasonable to expect to receive it.

8. Conferences (of the heads of departments). One of the most abused words in the English language is the word conference as related to a meeting of a group of executives. The reason for this is that the purpose of a conference is information and to determine policy. When we begin to hold conferences to determine method, we are belittling the conference and needlessly consuming time. This, however, does not eliminate group discussion within a department on methods of carrying out a predetermined policy of the whole.

9. Contact. If there is one thing more than another that will beget co-operation it is personal contact. This can be established not only within the department but between departments. Heads of departments see, hear and grasp many points with relation to other departments that would be invaluable if passed on.

10. Programming. The most exact method that can be used by a department head for the securing of a plan for himself that will include his own department is to program the future. By programming is meant the simple process of putting down on paper the tasks for a definite period. Every link whereby the department relates itself to every other department is included in the program. It is an advance record of future co-operation.

There is an oriental saying that "It is just as easy to walk with a man as it is to walk four paces behind him." It is easier to compromise and co-operate with a man than it is to offer obstruction and opposition.

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Training Potential Executives in the Rank and File*

By R. E. Danforth
Formerly Vice-President and General Manager Public Service Railway, New Jersey

SUCCESSFUL continuance of the electric railway as an effective, reliable and economical mode of public transportation depends upon training of potential executives in the rank and file. It is not a new subject. It does not concern a problem peculiar to our industry. History fails to reach far enough back in the ages to mark its origin. It is universal wherever a group of individuals work under a leader, or leaders, to a common end—the perpetuation of authority and ability to control or direct.

If the employing agency has selected for employment men and women of good health, good character, a clean record, fair education, normal intelligence and a good disposition or cheerfulness, we may say safely that given proper supervision and training, able executives may be obtained from the rank and file of the employees. The great difficulty is, however, that the terms of the qualifying clause are often, if not usually, ignored in actual practice, as found upon our electric railways—not to say upon industrial concerns generally. "Given proper supervision and training"—that is where we are weak—where we generally fall down.

Experience alone does not fully equip the individual for an executive position, nor does education, whether technical, legal, scientific or classical. No, nor do the two together, great as their combined values are. Neither does ability to plan and devise ways and means to accomplish any purpose or work. Other qualities are needed today, including the ability to express one's ideas clearly and to get them across to others successfully.

Characteristics which are inborn in the man are of equal importance with those developed through training and experience. Good old-fashioned virtues they are and, praise be, so often found in the rank and file of our own employees. Honesty, loyalty, courage or determination to see a thing through, kindliness with its gift for making friends, enthusiasm for the job or the business, vision—eyes and brain that see things as they are and as they should or will be—all compounded into good old horse sense and gumption.

Given the specifications and the raw material, how are we to go about developing the executives of the future? Leave it to George, or to chance? No—of course not. The chief executive of a large system may not know personally all of the thousand or more employees under him. On such a system, however, there are other executives who can and should know the men in their own departments, and have at hand the personal records of many, if not of all of them. It is someone's business to know, and that individual is under a heavy obligation to his company and to its employees to see to it, first, that each employee does well his particular task; second, to see that he is properly fitted for advancement when opportunity offers, and third, to see that individual records show the good points of each employee and that such record is in due time made known to the executive who selects individuals for promotion.

Managerial timber is to be found in nearly every organization of average size. The problem is to find and develop it for use. The minor supervisory positions are usually filled from the workers in the particular department involved, and the selection is often too haphazard. Knowledge of the work and practice of other departments is valuable to those who are suitable for continued advancement. Opportunity to gain such knowledge should be given to the more able and progressive of the organization.

I advocate the systematic training of promising young men for executive positions—young men selected for the purpose when hired, or soon thereafter. Where possible, high school graduates should be shifted from department to department systematically during the first year or two of employment, in order to give them a general working knowledge of and sympathy with the methods and problems of each. These young men may then be placed in the ranks of any department and be permitted to grow up there until age, experience, evident ability to progress and personal records show them ready for promotion. I would call such young men "apprentices."

Others who have had a college education may be put through a "cadet engineer's course. After completing this with satisfaction they may be placed in some minor supervisory position or used as executive clerks to the general manager, superintendent or head of department, or be placed on the engineering staff, to be later transferred and used as occasion warrants. Many men now in positions of high responsibility were so trained.

We may often make mistakes in selecting these young men for apprentices or cadets. We may later find them not suited for the railway business. Therefore, the weeding out process, based upon a more intimate knowledge of the young man's ability and his probable fitness for railway executive work, is necessary. Let the weeding begin soon—but not too soon. Some develop slowly. Some have to unlearn many things before their true worth is made evident.

Look within your organization for men capable of being trained to carry on, and spare no effort to develop within the organization's ranks: Esprit de corps, knowledge of how to serve the public, the habit of courtesy, of economy and of willingness—of eagerness to learn new ways and up-to-date methods of operation and of service, and the fixed idea all up and down the line that an official's prime duty is promptly to train, develop and have ready at hand a fit man to take over his job when he himself steps up—or out.

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Points on Which Traction and City Officials Should Agree*

By William Paw Capes
Director New York State Bureau of Municipal Research

CITIES are in a quandary as to the correct solution of the transportation problem and proper regulations for existing services. We are in a period of evolution so far as urban and interurban transportation is concerned. Is the continuance of the street railway a public necessity in all or some communities or in none? Is the motor bus an essential utility in all or some communities? If so, should it supplant the trolley car? Should it be permitted to compete with the street railway? Should it be used as a feeder for the street railway? Will the trackless trolley help to solve the transportation problem? Will science develop some new and more economical methods of transporting people? If buses are an essential utility, who shall the city permit to operate them? What regulations should be made for bus transportation. With street railways being rapidly relieved of the essentials of monopoly which they heretofore enjoyed, should regulation of their rates and services be made less severe? These are only a few of the many questions vital to transportation of the future to which the cities are seeking the correct answer.

Urban and interurban transportation is more flexible and less monopolistic than ever before. Even climatic conditions affect the degree of flexibility and monopoly. The private automobile has made transportation of human beings almost a seasonal occupation. The resulting complicated situation is appreciated by the public official.

Nevertheless the public wants transportation service, efficient and economical, at any time it sees fit to use it. The prosperity of the community requires such a service. The public holds its public servants responsible either for providing it or insisting that it be provided. The public officials are, therefore, thinking hard and acting cautiously. Officials of the transportation company are in about the same uncomfortable and complex situation. Therefore, the two first points on which public and company officials should agree

*Abstract of paper delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

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are those of establishing confidence and co-operating to seek correct answers to the many questions that are vital to the interest of those they represent.

There are two other points on which public and street railway officials should agree. The first relates to the provisions of law in respect to pavements which railway companies must construct and maintain. Most of the cities and all of the traction companies agree that the present law should be modified to permit a greater flexibility in determining for how much paving area the company should be held responsible. The present provisions are too rigid. No general law, however comprehensive, may satisfactorily completely and fairly take care of paving charges either in all municipalities or even in a single municipality. Different localities present different requirements as to the paving area.

The only way to avoid litigation, misunderstanding and bickerings is by fixing a definite area for which traction companies would be held accountable. The extent of this area will vary as previously indicated. I, therefore, present for your serious, and I hope favorable, consideration the suggestion that the present law be amended so as to provide that surface railway companies shall be compelled to construct and maintain pavements contiguous to their tracks, the area to be determined by ordinance of the local legislative body upon the recommendation of the city engineer; provided that such amendment will not permit a greater area than that now prescribed by law and will in no way abrograte or change any franchise provision or contract now in force in respect to paving.

All of the proposals which representatives of the traction companies have submitted make the corporations responsible for pavements damaged by the existence of the tracks in the streets, such damages to be determined by the city and the traction company or by the Public Service Commission. The adoption of such a proposition would lead to endless litigation, misunderstanding and bickering which would cost the companies in legal services and good will a large share of the amount they hope to save through a change in the law.

My last point deals with delayed trolley service resulting from traffic congestion due to the parking of motor vehicles. Our studies show that in many cities this is a serious problem. The cities of New York State, through the State Bureau of Municipal Information, have investigated the parking problem and recommended a complete parking program for any city. Those recommendations which will be of particular interest to your association are as follows:

In view of the fact that traffic will continue to increase and that attempts to relieve congestion by parking time limits, traffic diversion and other restrictions do not and cannot satisfactorily and finally care for the interest of the public generally, the merchant or the automobile owner, it seems evident that eventually cities will be forced to prohibit street parking within and adjacent to congested districts, except in unusually wide streets. To put such a regulation into effect at one time and for the entire district, however, would be too drastic a step. It would for a time at least, seriously affect business conditions unless near-by off-street parking places were provided, and no city at the present time has adequate facilities for the parking and storage of vehicles off-street and conveniently located. For these reasons we believe that cities should undertake a gradual prohibition, as the needs require. They should apply the prohibition first to the most seriously congested thoroughfares and gradually extend the regulation as the pressing needs require and off-street parking facilities will permit.

We believe that in congested districts no parking should be allowed in a street in which street cars operate unless there is room for at least one line of travel, 10 ft. in width, between the street car area and the line of vehicles parked at the curb. This is the very minimum under which parking should be allowed. This will not, however, solve the parking problem, for traffic will be impeded and often interrupted and the fire hazard will be great. Under such conditions, and with parallel parking, the minimum width of roadway should be as follows: streets with a single trolley line, 47-ft. roadway; streets with a double trolley line, 57-ft. roadway.

Traffic will not be seriously affected and fire hazards will be practically eliminated if parking is allowed only in a congested street, the roadway of which will accommodate two lines of moving traffic and one line of parked cars between the street car area and the curb. Under such conditions, and with parallel parking, the minimum width of roadway should be as follows: streets with a single trolley line, 67-ft. roadway; streets with a double trolley line, 77-ft. roadway.

Whether or not parking should be prohibited absolutely or in part in streets whose widths are greater than those above specified, depends upon traffic conditions. No general recommendation can be made for these.

It needs no argument by me to convince you that if these recommendations were made effective in every municipality, your troubles so far as delays resulting from congestion are concerned would be eliminated. Why are they not adopted? That question brings the discussion on this point to a head.

In approaching the street parking problem, cities must consider the needs and desires of three groups: the public generally, the business man and merchant and the motorist. It is exceedingly difficult, if not almost impossible, to provide regulations that will meet all needs and satisfy all desires.

If you expect the city to regulate parking so as to eliminate trolley car delay, you must give those officials who make and enforce regulation your unstinted moral support. They will need all the help that you and others interested in efficient transportation can give them to prevent selfish interests upsetting their plans and thwarting their efforts.

Co-ordination of Rail and Automotive Transportation*

By John A. Ritchie
President Yellow Truck & Coach Manufacturing Company

TO MY mind the American Electric Railway Association convention in Atlantic City last October marked a milestone in the advance of co-ordinated electric railway and motor coach transportation. Not only the display of motor coaches at a convention of street railway operators, but more especially the thoughtful, intelligent consideration in a large number of papers on the problems of motor vehicle operation, gave overwhelming evidence of the realization of our common interest as transportation men.

With the adoption of the motor vehicle new problems have arisen, especially the best way to use the motor coach. That brings up the subject of co-ordination.

The Public Itself Is a Dictator of Transportation

But who is to permit the co-ordination? We have a national dictator of transportation. He is not, however, an individual. This dictator is the public itself. But suppose we had a national officer called the "Dictator of Transportation." What would his first job be? Co-ordination.

He'd find that we have about 300,000 miles of steam and electric railroads, about 70,000 motor coaches, 3,000,000 motor trucks and about 17,000,000 passenger automobiles running over nearly 500,000 miles of improved highways and 2,400,000 miles of highways yet to be improved.

The transportation act of 1920 specifically recognizes this in its terms, something no preceding act had ever done. In Section 15-a, the so-called rate-making section, it provides that the commission, bearing in mind the necessity of railroad growth, shall permit rates on which the railroads may earn a fair return on their fair value. I do not feel that this has been accomplished—and that is another story—but the will of the people, as expressed by Congress, is in the act.

As to the railroads, at least, it practically repealed the Sherman anti-trust act, and the vigorous sentiment in approval of railroad mergers which are in the public interest is evidence of how far we have traveled. The value of co-ordination in railroad service is now beginning to be appreciated.

The big idea in regulation used to be restriction and preservation or incitement to competition, which often became competition of the cut-throat variety.

Courts and Commissions Approve the Idea of Co-ordination

Both courts and commissions have pointed out the value of co-ordinated service to the public. The Maine Public Service Commission, in refusing a certificate for a 955-mile independent motor coach system, said:

"We believe that the objective to be sought, in our state at least, is a co-ordination of public automobile service with that of the steam railroads and with such of the electric railways and street railways as will lend themselves to such co-ordinated service."

The courts have returned to the New Haven Railroad its trolley lines which were taken away in 1914 in an action under the Sherman anti-trust law. The New Haven based its appeal to the court on the fact that the Public Util-

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ities Commission of Connecticut had recommended to the General Assembly a co-ordinated service as in the public interest.

There was a time when such a judicial expression would have been practically impossible, and Judge Winslow's opinion is one of the highest significance.

You may be interested in some actual examples of co-ordinated operation. The largest in this country is that of the Public Service Railway Company of New Jersey with over 800 motor coaches. The policy of the company has resulted in more frequent service, cut down the number of bus-miles and car-miles operated and increased revenue on both cars and buses. Thomas N. McCarter, president of the corporation, in a letter to the stockholders said that "There can be no doubt that if co-ordination were brought about throughout the entire territory a great betterment in conditions would result."

In Philadelphia the Mitten Management was early in adopting the motor coach to relieve certain trolley lines and to feed others, as well as to meet competition from independent operators. It is now undertaking the taxicab business on a similar basis. In announcing its plan the management said:

"Co-ordination of transportation in big cities has been a steady onward march. It is inevitable. You can no more stop it than you can stop the law of gravitation."

In Providence, R. I., motor coach service was co-ordinated with the trolley by allowing the trolleys to run as expresses, with motor coaches taking care of the local passengers. This has gained much public good will and has resulted in increased net income.

The Pennsylvania-Ohio Electric Company operates an interurban motor coach service at Youngstown, Ohio, paralleling its own trolley car lines, but at a higher fare. This operation has proved both popular and successful.

The Colonial Coach Lines operate nearly 1,000 miles of intercity routes, chiefly in northern and western New York State, but extending into Pennsylvania and into Canada. Their rates are higher than railroad rates, but the operation is popular, successful and growing.

The Chicago, North Shore & Milwaukee Electric Line, operating between Chicago and Milwaukee, declares that through their more frequent and better service motor coaches have been directly instrumental in developing traffic where very little existed before. Furthermore, the operators say that the coaches have served as an advertisement for the company and in reaching out into the territory have secured many new patrons for their main line.

Co-ordination is advancing with great strides.

Whereas in 1920 only sixteen electric railways were using motor coaches, 280 companies, according to the ELECTRIC RAILWAY JOURNAL, were using them in 1925, and 2,171 motor coaches were purchased by electric railway companies in 1925, more than twice as many as in the preceding year, which itself held the record. On Jan. 1, 1924, only 14 per cent of the electric railways operated motor coaches. In the following year this was increased to 19 per cent and last Jan. 1 the proportion was 35 per cent.

More than 13,000 miles of motor coach routes are now in operation by street railway companies, most of which is new service.

MASS TRANSPORTATION BY ELECTRIC CARS AND RAPID TRANSIT LINES

Electric cars or rapid transit trains probably will remain the chief vehicles in moving large crowds of people within rush-hour periods. Certainly they will so long as they can carry masses of people more cheaply, for there will always be people to whom the price of service is of more importance than the quality.

And while co-ordinated, each service should be permitted to retain its individuality. Then it will build up custom for itself.

There can be no doubt that existing companies are the ones to whom this job of co-ordination must fall. By virtue of training and experience in the art and science of transportation, electric railway managements, in most communities, are better prepared to operate motor coach lines than any organization without experience in transportation, a highly technical and difficult field. Transportation is both a science and an art and they have studied it all their lives.

Electric railways generally have important financial connections and resources which are necessary to assuring continuous motor coach service. This is a most important point—financial responsibility. Service by fly-by-night companies inexperienced in transportation, often formed only as stock selling propositions, can never render a continuous, dependable, comfortable and satisfactory service.

Nor should important rights be granted to applicants if they seek, with promises of lower rates, to get their heads under the tent and invade a field already occupied. Specific instances of this have lately arisen in Buffalo and in several applications for franchises in the city of New York.

Such reduced rate promises are specious, for they never can be more than temporary, and the ultimate cost to the public is greater.

Decisions of courts and commissions are full of recognition of these facts. For example, let us read from a decision by the Wisconsin commission in the LaCrosse Gas & Electric case:

"Rate wars usually mean for a time lower than paying rates, failure to keep plants in the best operating condition, and in the long run inadequate service.

"They often result in ruin of one or more of the plants concerned, crippling of the rest and in the ultimate consolidation of the remnants in one concern.

"In the end customers will lose more through bad service than they have enjoyed through temporary low rates."

Just a word on another phase of co-ordination. It is time to get away from the word "monopoly." Co-ordination being new to so many may give an opportunity to the demagogue to arouse suspicion in the public mind by crying "monopoly." It is time we ceased using certain words and phrases that hurt us with the public.

For the best reasons of public policy should transportation companies be allowed ample earnings, to provide not only for present good service, but that future growth which the country will need.

In establishing a co-ordinated electric railway and motor coach service there will arise one point which may become of serious importance and which must be placed effectively before regulatory bodies. Superseded physical property has a definite value represented by your securities and the co-ordinated service must produce sufficient net earnings to amortize over a term of years the physical value of the superseded property. To follow any other course would discourage new investment.

Public utilities as a group are never done growing, except in a dead community. And this means that a constant supply of new capital is just as necessary as a constant supply of new coal.

There is only one way in the world for you to get this capital from the investor. He has thousands of other ways to invest his capital and he is, therefore, the final dictator. Earning power with safety is all that attracts him, and any rate of return that fails to attract the investor in needed public utility service is a rate that is against the public interest.

In my judgment the earning power of the steam railroads as a whole has never, since effective regulation began, been anything like adequate, and even more, of recent years, have the electric railways suffered.

In the manufacturing field we permit any rate of return that the manufacturer's sagacity, foresight, skill and judgment enable him to earn, even though it be 25, 50 or 100 cent.

It is easy to see why the investor fails to be attracted by 6 per cent, or 7 or 8 per cent, as a maximum which may be earned by a transportation company which has no assurance even of that and must stand its own losses.

It is no crime to earn a net return. The net earnings of industry as a whole is the source from which all existing wealth, facilities and comfort of the world have come.

Had there never been any net return to industry mankind would still be running around naked, dwelling in caves, living on fish and native fruits.

Production and transportation are the nation's right and left arms. What shall it profit the nation if one be protected but the other be allowed to wither?

LIMITATION OF FAIR EARNINGS A FORM OF "PRICE FIXING"

In my humble opinion the limitation by law of profits honestly made has no place on statute books. I cannot see that, in principle, it differs from the policy of governmental price fixing for the products of any other industry. It is an attempt to overthrow the law of supply and demand, and history has yet to record any governmental effort in that direction which did not ultimately force somebody to pay a disastrous price.

Not only has your industry a right

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to a good profit, but it is in the public interest that you should have it. No half bankrupt company can render good service. And your profits should be such as to enable you not only to serve the needs of the moment but to lead in new transportation development.

Next to providing transportation companies with adequate rates and fares, public officials should reduce taxation on all forms of public transportation. Taxes add to the cost of service, and it is in the public interest to make the cost of transportation as low as it is reasonably possible. The one who uses a public utility service should pay for it rather than the taxpayer.

The Jollying Trolleying Public*

By Edward F. Wickwire
Vice-President Ohio Brass Company

WHEN I was asked to give this little talk my first thought was respectfully to decline. I believe in the wisdom displayed by some of the so-called lower animals, such as the clam, for instance. The first thing the mother clam teaches her young is to keep its mouth shut.

However, having consented to violate the rules of the ancient and honorable order of clams, I was anxious to select a subject close to everybody — like underwear, for instance. But the program committee objected on the ground that in these winter days that subject is too rough, even for utility men. Finally we settled on the subject that is printed on the program, "The Jollying Trolleying Public." That was all right, because, like most people, I can discuss the other fellow's business better than I can talk about my own. Of course, anything that affects the electric railway industry has a direct influence on our ability to trot down to the corner grocery store on Saturday night and join in the groceryman's cash register chorus.

I am talking to you tonight not only from the standpoint of the 500,000 workmen who make electric railway supplies but also in behalf of the folks who are buying 43,000,000 electric railway rides in this country every day. How many of you have realized the fact that the electric railways of this country are furnishing 43,000,000 rides every day, and that the number is not decreasing, but steadily increasing.

When I speak of the jollying, trolleying public I am referring particularly to that part of the public which has for some years past, perhaps unthinkingly, been jollying the trolley out of existence in its conversation but still trolleying to the tune of something like 16 000 000,000 rides a year.

Try to imagine what would happen if we kicked the trolleys off the streets. If we substituted buses, that would mean something like two double-deck or three single-deck buses for every street car now in service.

If we think traffic is bad now, imagine what it would be if public transportation had to have double or three times the amount of street space during the rush hours. The buses would have to move so slowly that a tired snail with broken arches would outdistance them in half a block.

Replacing street cars with private cars would be worse. A friend of mine told me the other day he had driven his car 30,000 miles in one year—5,000 miles back and forth to work and 25,000 miles looking for a place to park.

As it is now, there is an automobile for every seven and a third persons in the United States. In other words, one out of every seven drives his own car. The fractions ride in ambulances. The remaining six evidently buy the 43,000,000 trolley rides every day, because very few of them feel able to walk.

I did hear of a Scotchman not long ago who walked 18 miles to see a football game, but he didn't gain anything, because when he got there he was too tired to climb the fence.

According to an accurate survey made here in New York, it takes seven times as much space to handle a passenger by taxi or private car as it does on a surface street car. If you include parked automobiles, it takes twenty times as much space per passenger. With these facts in mind, a man would have to be gifted with positively brilliant stupidity to claim that either the bus or the automobile could successfully take the place of the street car for mass transportation.

Russia has her Bolsheviks; we have our highly enthusiastic "Automotiviks," who advocate rubberizing all forms of American transportation, and who may, by some stretch of the imagination, have in mind stopping the production of pedestrians or perhaps producing a new race of tougher and more resilient pedestrians.

Can Destroy But Not Replace

The danger lies in the fact that competitive motor transportation can destroy a transit system which it cannot replace. Fortunately, however, people are beginning to realize that the "automotivik," the man who says buses can entirely take the place of street cars, has too much tortoise shell on his glasses and not enough focus in the lenses.

The bus has its place in urban transportation—but it is not in the place of the street car. Ask the people of Saginaw, of Toledo, of Des Moines and of Akron—the Rubber City—who tried to put buses in the place of street cars. They were mighty glad to get the cars back. They had to lose them to appreciate them—as the flea said when he left his comfortable old home on a tramp for a position on a wealthy old skinflint.

A study made in St. Louis showed that while street cars carry about 90 per cent of the people using the streets, yet they cause only 10 per cent of the congestion.

Since it is a well-established fact, then, that the electric railway is indispensable, the natural question is "What about the bus?" And the answer is, "Yes, there is a place for the bus." The next question that perhaps comes to mind is, "What relation is the bus to the trolley car, if any?"

Many of the early buses started at a time when electric railway expenses had increased enormously, while their rates of fare were held down to the starvation point. It was the zero hour in electric traction history and "wildcat" jitneys and "blunder" buses showed up, not to fill a need, but to grab a chance.

Like the sixth-class passenger on an ocean liner who went to the captain and said, "Can I have a berth to sleep in?" The captain asked, "Where have you been sleeping the past four nights?" And the passenger answered, "I was sleeping on a sick man, but he got well and won't stand for it any longer."

And so it is with the electric railway industry, it naturally objects to the bus living on it, but is actively carrying out plans for the bus to live with it.

Although electric railway men were not the first to operate buses, they seem to be the first and the only ones to endeavor to put in a complete, coordinated system which uses the buses as an addition to the existing transportation system, instead of a drain upon it.

Electric railway men who are experienced transportation specialists should be given an opportunity to work out the problem along sound, sane, economic, unexcited lines. The shrieks and tirades of the politician with a megaphone voice are no more useful than the whistle on a peanut stand. It makes a lot of noise, but doesn't roast any peanuts.

It is up to the people, who need the best possible transportation service, to discourage the type of public official who insists that the street car company shall pay for paving it doesn't use, pay big taxes, pay exorbitant damage claims, or, in a word, pay to feed and house the transportation cow, and then donate to the wildcat bus equal milking rights.

They have seized on the traction issue as a convenient vehicle for personal publicity. In one respect these politicians are like shoes—the cheaper ones squeak the loudest.

It is up to us to see that the bus isn't made to answer when the street car is called, but we do want the bus to take its place in the branches of transportation for which it is especially adapted.

For instance, the bus can provide a luxurious mode of conveyance, at a high rate of fare, to people who are willing to pay for that kind of service. Also, the bus has a very distinct mission supplying transportation in outlying sections of cities and in suburban communities not sufficiently populated to warrant expensive track extensions. Such service is usually not profitable in itself and the independent bus could not survive. But as auxiliary feeders to the trolley line, its use is justified.

The bus is also a good means of tying together various railway lines in cross-town or short-cut service, where the amount of traffic does not justify the heavy investment required for street car service.

*Abstract of address delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

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Used in that way, the bus reduces still further the necessity for walking, and that seems to be the aim of most people nowadays.

The problem resolves itself, then, into a matter of constructive co-ordination, instead of destructive competition. This will be a distinct disappointment to people who think it is more fun to throw bricks than to lay them.

The keystone of a well-balanced transportation system, using street cars and buses—each in its proper place—is recognition of the undeniable fact that public transportation is a natural monopoly, especially since it is subject to the strictest kind of regulation—sometimes this regulation almost amounts to strangulation. Perhaps some of you have the thought in the back of your heads that competition is a good rule. Generally speaking it is. But there are exceptions to all rules, no matter how good. For instance, "start at the bottom" is a good rule to follow, but it's even advisable to make an exception to that rule when you're learning to swim.

The transportation companies which operated horse cars and cable cars in the old days discarded them when the electric car was developed. And they may discard the electric car in time, but not until the right substitute has been devised.

Meantime, the bus and the trolley car, both controlled and routed by one responsible transportation agency, are the best means yet discovered for providing quick, convenient and cheap transit for the majority of the people.

So why not let the electric railways, which are transportation specialties, work out the problem, not hampered by too many restrictions? Some legislators seem to jump out of bed every morning with an idea for a new law about traffic. For example, a bill was recently proposed in a Western state providing that night-driven herds of cattle on the highway must be equipped with tail lights.

I believe it would be better to enact a law compelling all pedestrians to be equipped with reflectors—red lights for females under 30, violet for grass widows and green for old maids. In that way a lonely motorist could tell at a glance whom to pick up and whom to run over.

As a closing thought I would like to say that while it is a good idea to give buses all the backing they deserve, it is certainly a mistake to let them run over the backbone of mass transportation—the electric stret car.

I think I'd better quit right here, before you commence to think that I'm trying to imitate that famous Chinese orator "On Too Long."

Diversified Program at Louisville Meeting

Many Matters Discussed in Short Talks During One-Day Session of Kentucky Association of Public Utilities—Officers Were Elected and a Dinner-Dance Was Held

DISCUSSION of service matters, public relations, safety, advertising and publicity, co-operation between employer and employee and methods of improving the employee occupied an interesting one-day session of the Kentucky Association of Public Utilities, held at Louisville, Jan. 15. J. P. Barnes, president Louisville Railway, and president of the association, managed the program so that a large number of subjects were discussed and papers read during the short period of time available.

N. W. Funk, director of safety Louisville Railway, stated that in 1924 an economic loss of $500,000,000 was caused over the United States by accidents, that 100,000 people were killed and a million others injured in avoidable accidents. He discussed the remarkable improvement in facilities for the pleasure and convenience of mankind over the last quarter of a century, which have, however, increased hazard and made safety work more important and necessary.

D. L. Gaskill, secretary-treasurer of the East Central Division, National Electric Light Association, Greenville, Ohio, discussed "Value of Associations to Utility Men," bringing out that through associations utility men have secured a much better grasp of conditions and interchanged information.

Harry Reid, president Interstate Public Service Company and president Kentucky Utilities Company, talked on the "Future of the States' Utilities." He told of the formation of the association ten years ago with about eight present at a meeting at the office of the Louisville Railway, the small start growing into a large association and an organization for general good.

E. A. Jonas, editor-in-chief Louisville *Herald-Post*, delivered a humorous talk, on "What Is Power," referring to the power of the press, power of man, power of natural resources. George Colvin, superintendent Louisville & Jefferson County Children's Home, talked on "Public Utilities from the Citizens' Standpoint," holding that the industry was on the threshold of even bigger things than have been accomplished.

Labert St. Clair, director of publicity American Electric Railway Association, discussed "Don't Hesitate to Talk About Yourself." He argued for application of the golden rule, holding that it must be said, not sung from behind screens and frosted windows. He stated that today utilities were spending $20,000,000 to $25,000,000 annually on publicity and advertising and that it was doing a lot of good.

Dempster MacMurray, director of advertising and Publicity Middle West Utilities Company, Chicago, discussed "Relations of Public Utilities to the Press," in which he outlined the fact that the public had learned to depend upon the press for information concerning plans and policies of utilities and wanted the real information, not propaganda. He held that it was no place for a press agent interpreter, as it was a question of what the public wants to know and what the utility must know regarding public thought.

At the afternoon session W. J. Horrigan, consulting engineer, Louisville, discussed "Water Supply from the Standpoint of the Public Utility Company." Helen E. Steiner, director of public relations of the Ohio Public Service Company, made a few remarks regarding the co-operation of the women's committee in Kentucky and the excellent co-operation given by the utility executives in the state to the work of the women. She introduced Miss Isabelle Davie, secretary of the women's committee of the headquarters staff, N.E.L.A., New York City, who discussed "Women's Work in Public Utilities." N. M. Brigman, dean of the Scientific School, University of Louisville, discussed "Engineering Schools and Industry."

W. H. Hodge, manager advertising department, Byllesby Engineering & Management Corporation, Chicago, discussed "Customer Relations." He argued against suits against customers, for cutting red tape, quiet, sensible telephone operators, with pleasant voices and trained to their work, and a liberal policy, even if it meant smashing a lot of rules.

Dr. W. R. Jillson, State Geologist of Kentucky, in a talk on the "Natural Resources of Kentucky," said that state was on the threshold of a day in which public interest would turn to internal industrial development.

Officers were elected for the coming year as follows:

President—T. B. Wilson, vice-president and general manager Louisville Gas & Electric Company.

First Vice-President—H. J. Cochrane, president Maysville Public Service Company.

Second Vice-President—W. R. Power, general manager Ohio Valley Electric Railway.

Treasurer—A. A. Tuttle, treasurer Kentucky Utilities Company.

Secretary (re-elected)—E. P. Kelley, assistant to president Louisville Railway.

Executive Committee—J. P. Barnes, L. B. Herrington, W. H. Harton, J. P. Pope, P. S. Poge, H. D. Fitch.

About 150 utility men were present at the morning session and a slightly increased number at the afternoon session. On the evening of Jan. 14 there was a get-together dinner-dance in the crystal ballroom of the Brown Hotel at 7 o'clock. J. P. Barnes was toastmaster and welcomed the visitors. About three hundred attended the dinner-dance.

New England Street Railway Club

THE February meeting of the New England Street Railway Club will be held at Copley Plaza Hotel, Boston, Mass., on Thursday, Feb. 4, 1926.

There will be two sessions. The afternoon session will be called to order at 4 p.m. and will be devoted to three short papers on the subject of "Bus Maintenance." They will be presented by C. V. Wood, Jr., superintendent of bus division, United Electric Railways, Providence, R. I.; H. L. Sullivan, automotive engineer Eastern Massachusetts

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Street Railway, and D. S. Mackay, supervisor of automotive equipment Boston Elevated Railway.

The evening session will be held in the Swiss Room of the Copley Plaza Hotel and the following papers will be read:

"Relation of the Bus to the Street Railway," by W. B. Spencer, assistant to president United Electric Railways, Providence, R. I.

"Buses as Used on the Boston Elevated Railway," by Edward Dana, general manager Boston Elevated Railway.

"How to Use Buses to the Best Advantage," by C. T. Seeley, vice-president Chicago Motor Coach Company, Chicago, Ill.

This is the last meeting before the annual meeting and banquet, which will be held on March 25, 1926.

New Officers for Engineering Council

AT THE annual meeting of the American Engineering Council, held in Washington, D. C., Jan. 13-15, Dean Dexter S. Kimball of Cornell University was elected president. The vice-presidents elected were: Gardner S. Williams, Ann Arbor, Mich.; O. H. Koch, Dallas, Tex.; I. E. Moultrop, Boston, Mass., and A. W. Berresford, New York City.

Dr. H. E. Howe, Washington, D. C., was re-elected treasurer and Col. John H. Finney, Washington, chairman of the finance committee. L. W. Wallace was again elected executive secretary.

American Association News

Engineering Executive Committee Meets

Charles Rufus Harte Elected President, Succeeding Roy C. Cram, Who Tendered Resignation—Considerable Routine Business Transacted

ROY C. CRAM tendered his resignation as president of the Engineering Association in a letter dated Jan. 15. A special meeting was called for Jan. 23 to consider it. At this meeting, which was held at association headquarters, with First Vice-president Charles Rufus Harte in the chair, President Cram's letter of resignation was presented by Secretary Welsh. It is as follows:

January 15, 1926.

TO THE EXECUTIVE COMMITTEE,
AMERICAN ELECTRIC RAILWAY
ENGINEERING ASSOCIATION,
GENTLEMEN:

I have recently made a change in my company connections and find my duties there, combined with some matters of a personal interest, will require a great deal of my time.

I have found so far that the work involved in the office of president of the Engineering Association consumes a great deal of time and for the best interests of the association, as well as myself, I very reluctantly tender herewith my resignation as president of the American Electric Railway Engineering Association, which I hope will be accepted at your earliest convenience.

Thanking you for the splendid co-operation which I have had, I beg to remain,

Yours very truly,
(Signed) ROY C. CRAM.

The executive committee, on motion by Mr. Dalgleish, seconded by Mr. Graves, voted to accept with regret the resignation of Mr. Cram.

Acting Chairman Harte, asking Mr. Dalgleish to take the chair, offered the following resolution, to be spread upon the minutes and a copy transmitted to Mr. Cram:

Inasmuch as Mr. Roy C. Cram has changed his business connections, and having found his new duties require so much of his time that he feels he cannot properly attend both to this and to his duties as president of the American Electric Railway Engineering Association, he has accordingly tendered his resignation as president, to take effect at once; the executive committee of the Engineering Association, while greatly regretting the necessity for this action, can only accede to Mr. Cram's request.

From his first connection with the organization Mr. Cram has been an indefatigable worker, as an individual member of committees, as committee chairman, and in recent years as a member of the executive committee culminating in his election to the presidency of the Engineering Association.

Bringing to his work a never-failing enthusiasm and an untiring energy, Mr. Cram has materially advanced the work and the interests of the Engineering Association, and in accepting his resignation the executive committee hereby formally records its recognition and appreciation of Mr. Cram's services to the Engineering Association.

On motion by Mr. Harte, seconded by Mr. Durie, the resolution was unanimously adopted.

Mr. Harte then resumed the chair. On motion by Mr. Dalgleish, seconded by Mr. Miller, Mr. Harte was unanimously elected president to fill the unexpired portion of Mr. Cram's term. No action was taken to fill the vacancy existing on the executive committee.

ROUTINE BUSINESS TRANSACTED

Immediately following the adjournment of the special meeting a regular business meeting of the committee was called by the newly elected president, Mr. Harte.

The executive committee was advised of the approval by the way and structures committee of the simplified practice recommendation on shovels, scoops and spades. The executive committee voted unanimously in favor of indorsement by the association of this project.

Several matters in connection with the work of the American Engineering Standards Committee were considered. The question of the appointment of an alternate to Mr. Dalgleish on the main committee was discussed. The committee voted to authorize the president to appoint an alternate at the earliest possible moment.

The secretary announced that a final report on the design of plain girder rails for use in paved streets had been received from the sectional committee on special trackwork materials and plain girder rails. The committee on way and structures unanimously approved the report. The executive committee then approved the report and authorized its submission to the A.E.S.C. for approval as tentative American standard.

In referring to the procedure set up for handling the reports of sectional committees under the sponsorship of the association, it was pointed out that no definite procedure had been provided for submitting such standards to the membership for approval for inclusion in the Engineering Manual. After discussion Chairman Harte appointed the following sub-committee to study the entire matter of procedure: Charles R. Harte, chairman; R. H. Dalgleish, M. B. Rosevear and G. C. Hecker.

Chairman Harte transferred Mr. Dalgleish from the sub-committee on the program for equipment day at the convention to the sub-committee on the program for way and structures day.

The secretary read a letter from the American Society of Mechanical Engineers and the National Machine Tool Builders Association inviting the association to be represented on a sub-committee on standardization of tool holders and tool post openings. This project is a part of the work of the central committee on standardization of small tools and machine tool elements.

After discussion it was voted to inform the sponsor bodies that the association does not feel that its interests in the project are sufficient to warrant the appointment of a representative. It was decided also that the secretary should bring this project to the attention of the chairman of the equipment committee, requesting that he keep in touch with the movement as far as possible.

A letter from H. F. Brown, chairman of the committee on heavy electric traction, was read, suggesting that the publication of the Bibliography on Heavy Electric Traction might be financed by selling advertising to a selected list of manufacturers. Mr. Brown's feeling was that a number of the manufacturers were very much interested in having the Bibliography published. The executive committee felt that Mr. Brown's plan was worthy of serious consideration. It was voted to have Chairman Harte refer the matter to the committee on policy of the American Association.

A letter from James S. Mahan, Western Actuarial Bureau, was read, in which he pointed out that in the work of certain committees of the Engineering Association there would be an advantage in having someone familiar with fire insurance standards designated to work with these committees. After discussion Mr. Hecker was authorized to communicate further with Mr. Mahan and obtain any definite suggestions he had to make.

An invitation was received from the public utility group of the National Association of Purchasing Agents to send a representative to a conference which will be held in Schenectady on Jan. 28 and 29. The invitation had been referred to P. F. McCall, chairman of the committee on purchases and stores, who had arranged to send C. J. Swift, purchasing agent Chicago, North Shore & Milwaukee Railroad, to the conference.

A letter from the All-American Standards Council urging the association to support the pending metric standards bill (H. R. 10) was read and discussed. The secretary was instructed to acknowledge the letter and thank the All-American Standards Council for bringing the matter to its attention.

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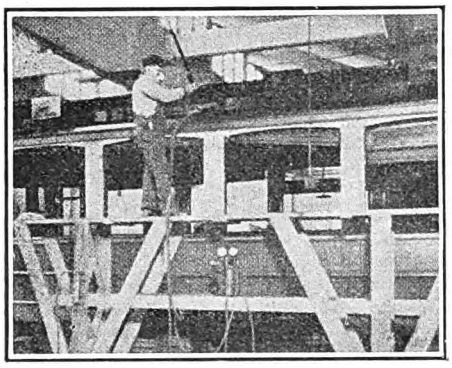
Maintenance of Equipment

Spray Painting Used in Chicago

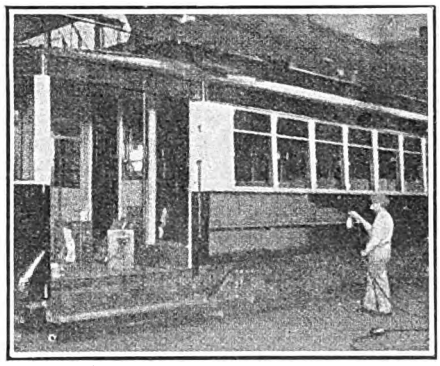
BY W. C. WHEELER
Equipment Engineer
Chicago Surface Lines

CARS are separated into three general classes for painting in the shops of the Chicago Surface Lines. In the first class are included new cars constructed and cars to be rebuilt. These naturally require the greatest amount of painting work. The second class includes cars in for overhauling and the third class cars which are to be repainted.

The preparation of the new car for painting begins very early in the assembly of the body, for all metal parts are given a coat of red lead wherever they come in contact with other metal. After assembling the frame and before any woodwork is placed thereon the entire surface for exterior painting is sandblasted so that it is clean and in proper condition to receive the coat of priming paint. After this is applied, the car is allowed to stand for at least one day before a coat of process No. 2 is applied.



Applying a Coat of Paint to the Roof



Spraying the Car Body

On the fourth day a coat of thin putty, or what is known as knifing compound, is applied to give a smooth surface. The fifth day the surface is sanded with linseed oil and benzine, and a second coat of process No. 2 is applied on the sixth day. The seventh day the surface is smoothed with dry sandpaper and one coat of red ground color is applied to those parts of the body that are painted red and a coat of cream ground color is applied to the rest. On the eighth day the paint is allowed to dry, followed by a coat of red color varnish and a second coat of cream color varnish on the ninth day. Lettering, numbering and decorating are done on the tenth day. On the eleventh, thirteenth and fifteenth days the first, second and third coats of body finishing varnish are applied. This allows the varnish to dry on the twelfth and fourteenth days.

Construction of the woodwork portion of the car body is carried on simultaneously with this painting program, so that the painting of the interior can be done at the same time as that of the exterior. Special precautions are taken to see that the interior receives a very fine finish, as well as one that prevents deterioration due to improper protection. The floor is painted underneath as it is being laid and then it receives three coats of paint after it is in place, the last coat being a varnish color. Forty-eight hours are allowed to elapse between coats, so that the paint may dry thoroughly. All interior woodwork is oiled with boiled linseed oil and stained to a uniform color, after which it receives two coats of varnish and is rubbed down to a dull, smooth finish. The roof boards are painted with one coat of paint and the canvass is applied while the paint is wet. The roof is then given two coats of paint.

The second class of cars includes those whose condition is such that the old paint must be entirely removed and a new surface prepared. Cars with wooden panels have the old paint burned off with a gasoline torch and scraped. The steel panel cars are sandblasted clean. After this the treatment is practically the same as for a new car. This class also includes cars on which a great deal of new work is necessary during a general overhauling.

The third group of cars includes those which are still in good physical shape but which can be helped greatly in appearance by a coat of paint and varnish. These cars are washed thoroughly and any small scratches or breaks in the wood are primed, filled with putty and then the entire surface is given a coat of color varnish. After the lettering, striping and decorations are retouched the car is given one or two coats of finishing varnish as conditions require.

In order to reduce the time necessary for the car to be held out of service during the painting process, time-saving methods have been introduced from time to time. One of these is the use of the spray gun to paint the roofs, trucks and under parts of car bodies. The lettering, numbering and decorating of the car, with the exception of the striping, are done with decalcomania transfers, which permit a great saving of time over the old method of hand work.

Steel I-Beam Under Joints in Concrete Paved Track

SPECIAL concrete construction has been adopted for car tracks in Augusta, Ga., regardless of the type of street pavement. The construction used at joints to prevent depressing of the tracks under passing cars and so produce strains in the paving, which might result in cracks, is told in the *Concrete Highway Magazine* for November, 1925. A steel I-beam is welded under each rail joint and a 3-ft. x 3-ft. concrete block, 19 in. thick, is cast under the beam for a foundation. This construction provides a rigid track which is not depressed by passing cars and in which the rails, ties and adjacent pavement all work together to support the load.

Concrete paved streets vary in

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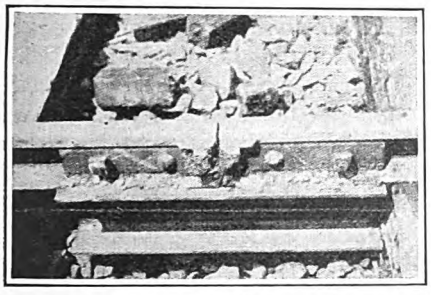
width from 24 ft. to 50 ft., exclusive of the car tracks. Transverse expansion joints are installed at intervals of from 40 to 75 ft., depending upon the distance between street intersections. A 2-in. board is used as the expansion material. This board is cut to the exact cross-section of the street and, until the concrete is



A Steel I-Beam Supported on a Concrete Pier Is Welded Under Each Rail Joint in Concrete Paved Track in Augusta

placed above it, is held accurately at right angles to the pavement surface by stakes. When the top of the board has been worn off by traffic, the joint is filled in with bituminous material. The street railway company's charter provides that the city must maintain all paved car-track areas. Driveways on either side of the track are paved to within 18 in. of the rail. After this pavement has hardened sufficiently to permit working on it the car-track area is paved. The space between the bottom of the ties and the top of the rail is filled with 1:1½:3 concrete. This makes a rigid concrete construction and the steel beam to support the joint has proved of particular benefit. The electric railway company prepares the track and the city pays for the paving.

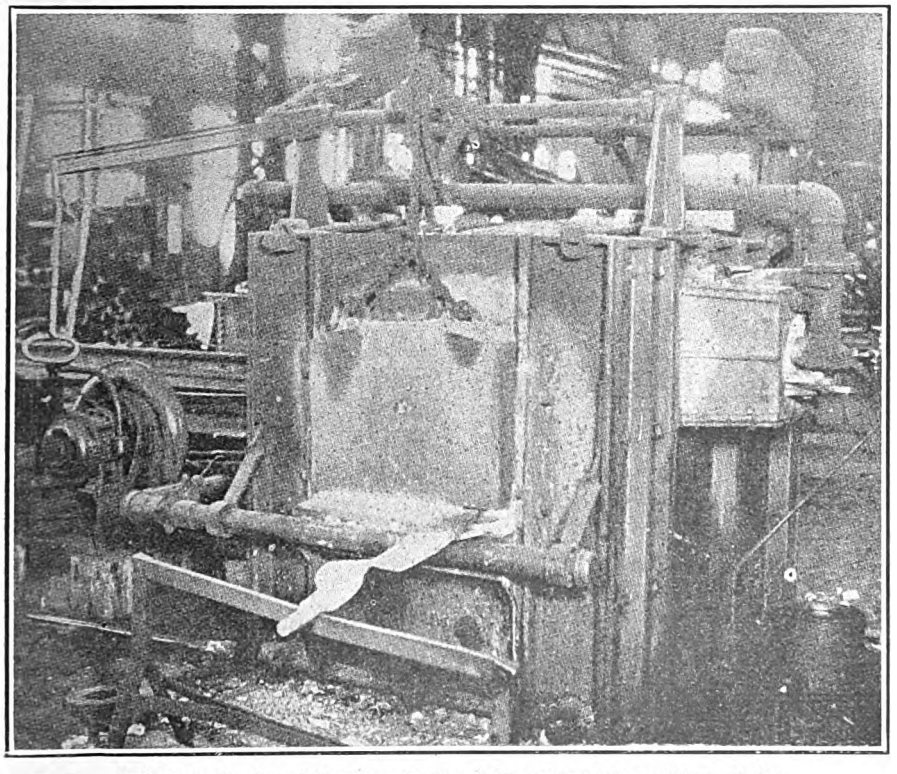
Calorizer Equipment for Shop Furnaces

EFFICIENCY in the Cold Spring forge shop of the Milwaukee Electric Railway & Light Company has been improved considerably by equipping the fuel-oil-fired heating and annealing furnaces with calorizers. The accompanying illustration shows one of the furnaces in operation with the calorizer equipment.

The calorizer is shown at the right-hand side of the furnace and consists of a box-shaped attachment with an atomizer and gasification and combustion chambers. The small pipe from below leading to the calorizer feeds the fuel oil from the large storage tanks, while the large pipe over the furnace to the calorizer delivers the low-pressure air required. This air is supplied from a direct-connected motor-driven blower mounted to the left of the furnace.

In the calorizer the fuel oil is atomized and intimately mixed with air and so serves the furnace in a similar manner as the carburetor serves a gasoline engine. Provision is made for quick gasification, followed by the addition of the exact amount of air to insure the most perfect combustion possible. Low-pressure air at from 8 to 12 oz. per square inch is used for both atomization and combustion.

The temperature and composition of the gases in the calorizer-equipped furnace are under the control of the operator and any conditions desired can readily and easily be secured and maintained. There is also a more even distribution of heat throughout the furnace and very little if any gases or smoke are emitted. This gives more satisfactory working conditions. Increased production results from the time saved from bringing the furnace up to proper heating temperature by properly controlling the temperature and by improved distribution. These economies have more than justified the change from the old style oil burner to the calorizer for the oil-fired furnaces.



Calorizer-Equipped Furnace in the Cold Spring Forge Shop of the Milwaukee Electric Railway & Light Company

Redwood Blocks Make Durable Shop Flooring

FOUR-INCH blocks cut from new redwood ties were used recently for a wood-block flooring for the machine shops of the Los Angeles (Cal.) Railway. This made a cheap, durable flooring, easily constructed by unskilled labor, which is giving satisfactory service.

The ties, each 6 in. x 8 in. x 6 ft., were first surfaced on four sides to insure uniformity. After the blocks were cut they were creosoted and placed on end, ¼ in. apart. The subbase was then graded and rolled and any depressions were filled with dirt and rerolled to insure a firm foundation. Grade stakes were set about 10 ft. apart and a base of 5-in. concrete was poured, care being taken to surface this as level and smooth as possible. This was necessitated by the fact that no sand cushion was used. The blocks were placed directly on the concrete base, which was first thinly surfaced with hot asphalt, and they were set into the asphalt while it was still liquid. By hitting the block with a wooden mallet, it was found to stick to the asphalt and was thus held in position until the entire floor was laid.

A ⅛-in. x 1-in. x 1-in. angle iron 6 ft. long, on which two small handles had been welded, was placed over the first row of blocks along the wall at one edge of the area to be

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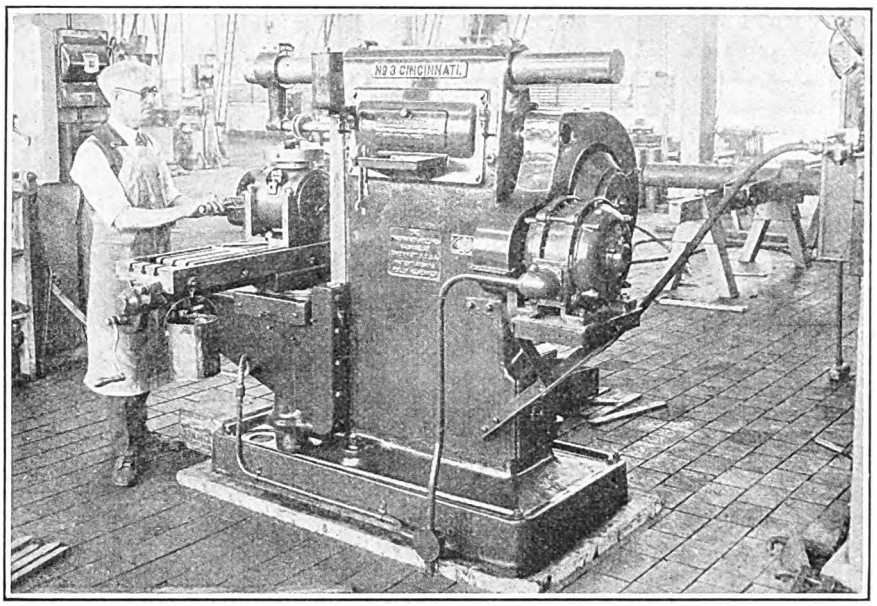


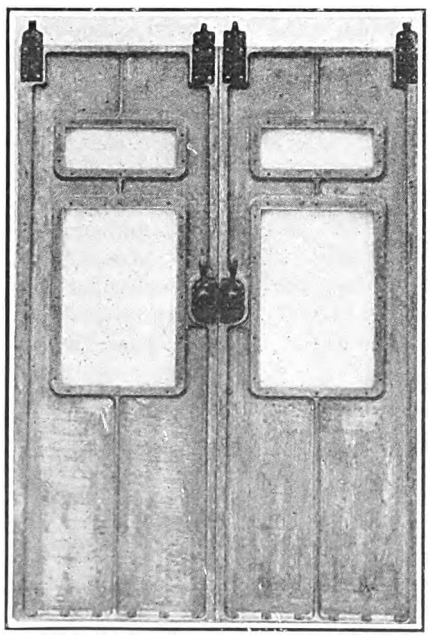
Wood-Block Flooring in the Shops of the Los Angeles Railway

laid. The next row was then placed snugly against it, securing alignment of each succeeding row. Several piles of loose sand were dumped on the surface after all blocks had been placed and this fine sand was swept into the cracks between blocks. Oil from various machines eventually saturated this sand, holding the blocks firmly in place.

New Equipment Available

All-Metal Car Doors

MANUFACTURED from a new aluminum casting alloy, a new design of door for electric cars has been patented and put on the market by Lightalloys, Ltd., London, England. The alloy used for the construction of these doors is a binary one, containing 86.5 per cent of aluminum and 13.5 per cent of silicon. These materials are subjected to a special refining and modifying process in the foundry. The treatment changes the original properties of the alloys and produces a fine grain material having great strength, ductility and toughness. The tensile strength under test amounts to approximately 13 tons per square inch with an elongation in 2 in. of 7 per cent.



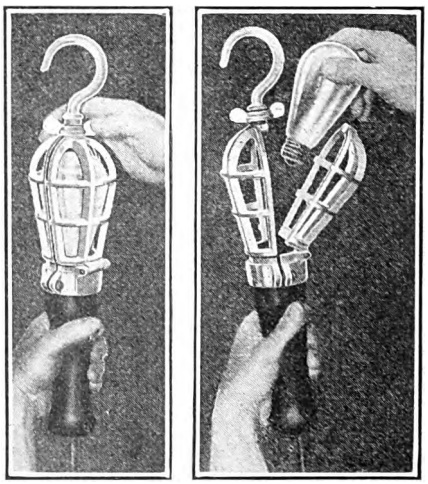
Aluminum Sliding Doors for Electric Car Service

Advantages of this type of door over built-up wooden construction are that the metal door is more rigid and there is no tendency to warp when exposed to bad weather conditions. The design of the metal door provides a wide extension at the lower end, and when mounted as a sliding door in electric car service danger from jamming or tilting is reduced.

The mounting for sliding consists of two ball bearing wheels, the inner race being stationary and held in position by three rivets which pass through two steel plates into recesses in the main casting. The outer race, which is free to rotate, is formed with a groove and runs on a rail fixed to the floor of the car. The top guide is of extruded manganese bronze. A flexible edging is provided which consists of rubber, vulcanized onto patent leather. This is fixed firmly to the front edge of the door by means of aluminum binding strips. A long strip of rubber fastened on the back of the door acts as a dust excluder when the door is closed. The slot for housing the roller guide used in mechanical opening and closing of the door is lined and faced with bronze. A small plough is fastened to the bottom front end of the door to keep the sliding rail slots clean.

Safety Guard on Lamp

CONSTRUCTED to withstand the severe service encountered in electric railway shops, a hand lamp with strong safety guard has been brought out by the Crouse-Hinds Company, Syracuse, N. Y. The guard and half shade are made of special aluminum alloy, which is light in weight but very strong and tough. The hook at the end of the guard is large and strong and is swiveled so that when half a shade is used the light can be directed as desired. A compression washer prevents a twisted lamp cord.



Construction of Safety Hand Lamp. At Left, Guard Closed; at Right, Guard Open

The handle is of seasoned maple, black enameled, and contains the lamp socket and a strain release cord clamp. The socket is of weatherproof type and is made of heat-resisting, molded, insulating material. The guard may be opened by a few turns of a wing nut which holds the parts together at the top. The hinged side of the guard swings back and gives free access to the lamp. There are no detachable parts which might be lost easily.

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The News of the Industry

Franchise Committee Appointed in St. Louis

Mayor Victor J. Miller of St. Louis, Mo., has appointed a special committee to draft an ordinance embodying a franchise for the St. Louis Public Service Company, which has been organized to take over the properties of the United Railways. When the ordinance draft is completed Mayor Miller will invoke the initiative provisions of the city charter to submit it to a vote of the people for ratification. The committee will be composed of the Board of Public Service, the Comptroller, the President of the Board of Aldermen, the City Counselor, the committee on public utilities of the Board of Alderment and the Mayor.

The action of Mayor Miller assumes that the receivership of the United Railways will be lifted at an early date. It is probable that on Feb. 15 Federal Judge Faris will conclude the litigation involving the affairs of the company, join all the issues and order a sale of the properties of the company under foreclosure.

An amendment to the public service commission act passed by the Missouri Legislature of 1925 provides the manner in which a service-at-cost system may be put into effect. The amendment was passed at the instance of the reorganization committee of the United Railways. It defines and provides the service-at-cost arrangement.

It is believed that the basis for the new franchise will be the finding of a transit survey by the St. Louis City Plan Commission made in 1920. This will be revised and brought up to date. It is also believed that the new measure will provide specifically for co-ordination of street car and bus. Mayor Miller favors that plan.

The 1920 survey report provided for eight main arteries of traffic from the down-town district, all other streets being left clear for vehicular travel. It also provided for the rerouting of various lines. It covered 370 miles of track and 70 per cent of the city's area. It was based on the assumption that a quarter mile walk to a street car is "easy walking distance," and on that theory recommended the elimination of 65 miles of street car tracks by shortening and straightening existing car lines.

The City Plan Commission recommended against the establishment of a rapid transit system. It contended that the volume of traffic in any one direction was not sufficient to warrant the outlay.

In recent months the city, through a special committee of the Board of Aldermen, has made a special rapid transit survey. This report is now in preparation. C. E. Smith, consulting engineer for the Department of Public Utilities, who is in charge of the details of this survey, favors the creation of a rapid transit system, including subways in the down-town district.

Fare Question Up at Louisville

The question of whether the Louisville Railway, Louisville, Ky., will get an increase in fare from 7 cents cash, with a 6-cent ticket fare, to a straight 7-cent fare was expected to come close to settlement at a meeting scheduled for Jan. 26, at which officials of the railway were to meet members of the Board of Works. The railway's statement for the twelve months ended Dec. 31, 1925, shows that the barometer fund is under the $200,000 limit, at which, under existing agreement with the city, the fare would increase automatically on Feb. 1.

It is understood that members of the Board of Works conferred a few days ago with the City Attorney and officials of the Public Utilities Bureau about the railway's statement.

Railway and Bus on Super-Highway

Elaborate Program of Detroit United Contemplates Use of New Light-weight Cars and Double-Deck Buses—$1,000,000 Program for Detroit-Pontiac Line

A. L. DRUM, executive manager for the receivers of the Detroit United Railway, has outlined contemplated improvements in the D. U. R. service between Detroit and Pontiac and cited reasons for the company's contention that it should have control of the transportation on Woodward Avenue, where the Detroit Motor Bus Company has also petitioned the Public Utilities Commission of Michigan for permission to operate. It was intended to hold the hearing in Lansing on Jan. 26.

It is pointed out by Mr. Drum that in the development of the super-highway between Detroit and Pontiac the Detroit United Railway has co-operated to the utmost with state authorities during the past construction season and it is the earnest desire of the receivers to continue that co-operation. The state's plan for this wider Woodward Avenue involved relocating the railway's tracks in the center of the highway. The company owned certain tracts of land and private rights-of-way, but it joined in the Governor's program. The work done so far, together with that to be accomplished this year, involves the company in an expenditure of more than $300,000 for track and overhead.

Fully appreciating the rapid development of this section of the territory served by the company, a construction program has been started as part of which the company is now receiving ten of the most modern light-weight cars particularly adapted for this service.

The D. U. R. will shortly start a limited service every hour on the hour between Detroit and Pontiac. Stops will be made only at the principal cities and important intermediate points. When the line is functioning as anticipated, new and additional outlay on this division for cars, tracks, terminal stations and buses will be more than $1,000,000.

As soon as the double tracking is complete and the road brought to grade throughout, waiting rooms and shelter stations will be provided and well-lighted passenger platforms for the rail passengers will be placed within the curb line out of the way of general vehicular traffic.

Mr. Drum expects that the new electric car and bus passenger terminal station at Highland Park, opposite the Ford plant, will become one of the busiest passenger stations of its kind in the United States. It is expected that very heavy short line electric rail and bus service will be operated from this Highland Park terminal station northerly over Woodward Avenue to the several cities and communities along the route, so as properly to fit the carrying capacity and routes of electric car and bus service to the volume of the traffic between Highland Park and Pontiac and the intermediate cities and communities.

It is pointed out that to supplement the rail service the receivers recently purchased the Star Motor Coach line, operating in this territory, to the end that rail and coach service may be properly co-ordinated and properly administered.

The management of the D. U. R. is rapidly organizing and improving bus operation between Detroit and Pontiac. It proposes to add new and improved motor coaches to this service as rapidly as possible. The existing equipment is being overhauled and newly painted. Application has recently been made to the Michigan Public Utilities Commission for authority to try out a special short line service from the Highland Park terminal to Ferndale, Pleasant Ridge and Royal Oak. Double-deck motor coaches seating 60 passengers will be run. It is the expectation to operate many double-deck coaches on the Woodward Avenue super-highway from Highland Park to Royal Oak, Birmingham and Pontiac to serve the peak loads of traffic to and from the industrial plants. These vehicles will be

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especially advantageous in serving the large volume of excursion and sightseeing traffic that will be attracted to the Woodward Avenue super-highway during the spring, summer and fall.

Mr. Drum further points out that unified operation will unquestionably produce greater benefits to the people than can any competitive operation, particularly where there is such absolute control by the authorities as in Michigan. According to Mr. Drum anything less than unified operation will have an ill effect upon the people through eventual poorer service or higher fares, or both.

Seek Better Service in Nashville

Conferences between engineers of the Nashville Railway & Light Company, Nashville, Tenn., and the Railroad and Public Utilities Commission will be held in an effort to work out some plan to relieve traffic conditions in the downtown section of the city. This decision was the result of a hearing before the commission. The company announced it welcomed suggestions about its service.

Interstate Sunday Passes Added at Wheeling

Following expiration of the formal 30-day notice required by the Interstate Commerce Commission, the Wheeling Traction Company, Wheeling, W. Va., added a series of interstate Sunday-holiday passes as of Jan. 24. The new passes are: "Ohio," from Wheeling to Martin's Ferry, Lansing and Bellaire, 25 cents; "Ohio-Greater Wheeling," from the continuous community Warwood-Wheeling-Benwood to Martin's Ferry, Lansing and Shadyside, 50 cents; "Ohio Terminals," from Wheeling to ends of lines at Rayland, Barton and Shadyside, and "Windsor," from Windsor to Steubenville, 50 cents. The Wellsburg-Weirton 50-cent pass and the "Universal" $1 pass were liberalized to take in Steubenville and all Ohio routes respectively. The Steubenville-Brilliant (Ohio only) 25-cent pass was added Jan. 1, following the West Virginia passes inaugurated Dec. 25. A novel feature in the sale of this pass is that tickets are accepted in payment, owing to the fact that most regular riders are supplied with strip tickets and are therefore less inclined to lay out additional cash.

Messrs. Stotesbury and Mitten Settle Differences

The following announcement was issued on Jan. 27 by the Philadelphia Rapid Transit Company:

Through the good offices of General Atterbury, the unfortunate misunderstanding which has existed between Messrs. Drexel & Company and the P. R. T. management has been completely removed.

Mr. Stotesbury and Mr. Mitten met in General Atterbury's office just before Mr. Stotesbury left for the South and agreed to work together in harmony for the advancement of the city.

E. T. Stotesbury is head of the banking house of Drexel & Company. Thomas E. Mitten is chairman of the executive committee of the P. R. T. and president of Mitten Management, Inc. General W. W. Atterbury is president of the Pennsylvania Railroad.

Christmas "Lucky Bags" Sold at Baltimore

Street car fare tokens as appropriate Christmas presents attracted considerable attention in Baltimore when the United Railways offered them as a solution to the "what to give" problem. Shortly before Christmas the company publicly announced "Lucky Bags" of car checks as useful and economical Christmas gifts.

The "Lucky Bags" consisted of a small green bag tied with red ribbon and sealed with red wax. Each bore a gift card with the following:

In wishing you the best of luck
Upon this Christmas Day
I'm sending you these tokens,
Which will help you on your way.

Each "Lucky Bag" contained thirteen tokens, each good for one fare on the cars of the United. The bags were sold at 98 cents each. The fare is 7½ cents, when tokens are used, and the United pointed out that the additional half cent helped to defray the cost of the bag, ribbon, seal, card, etc. The company stressed the fact that the "Lucky Bags" made acceptable gifts for "friends, relatives, the office boy, the stenographer, the cook, the maid, the elevator boy, the ice man, the coal man, the janitor, your Uncle Bim—in fact, everybody."

The "Lucky Bags" were sold at the offices of the United and at a large number of stores, banks and other places in all parts of the city.

"Use the Car" Campaign in Birmingham

The Birmingham Electric Company, Birmingham, Ala., owner of the electric railway system at Birmingham, is conducting a campaign to induce the public to use the street cars more and

The Message of the Birmingham Company

the automobile less for business purposes. Attractive display advertisements are appearing in the Birmingham newspapers.

The parking problem in the downtown section is a matter that is giving the city officials serious concern. The Birmingham Electric Company is taking advantage of the situation and is advising the public to ride the street cars as a means of solving the parking question.

New York-New Jersey Loop Line Suggested for Commuters

Speedy construction of an interstate rapid transit loop, 17 miles in length with tunnels under the Hudson River at the Battery and West 57th Street, New York, has been recommended by the North Jersey Transit Commission in its report submitted to the Legislature by Gov. A. Harry Moore. The cost of constructing the loop, which would consist of a subway in Manhattan and elevated or depressed tracks on the New Jersey side, was estimated at $154,000,000, with $40,000,000 additional for equipment.

Governor Moore said:

Having in mind that it will take probably from eight to ten years after actual construction has been commenced to complete an adequate transportation system, and that suburban terminals are now practically at the saturation point, it is obvious that the solution of this problem may not longer be delayed.

Governor Moore recommended that the commission not only be continued with a proper appropriation but that it receive broader powers of negotiation, such as would be necessary with the authorities of New York State and New York City, if the plan was to be carried out.

A bill designed to establish the commission as a statutory body, instead of one depending upon each Legislature for continuance, has been introduced by Senator Mackay of Bergen County. This bill authorizes the appointment by the Governor of a commission of seven members.

The recommendation for the construction of an interstate loop was only one of many by the commission for the relief of congestion in the so-called "inner ring" of New Jersey, consisting of Hudson, Essex, Bergen and Passaic Counties, within a radius of 20 miles from the City Hall in New York. This territory, the report said, has an area of 706 square miles, a population of 1,951,000 and tax ratables of $3,122,000,000.

Limited Cars for Rush-Hour Service

The New York State Railways notified the Public Service Commission on Jan. 20 that it would put into effect the commission's suggestions for limited cars for through service from Utica to Clinton between 4.30 and 5.30 each afternoon. The limited cars will leave Utica at 4.30, 5 and 5.30 p.m. The purpose of the through cars is to meet the objections of patrons of the Clinton-Waterville bus line that Clinton cars were crowded each night during the rush hour with Utica city passengers. The company also notified the commission that it had instructed its operators to delay the departure of cars from Clinton when buses of the Barber company are in sight in order to accommodate passengers going to Utica.

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Contract Signed in Chautauqua —Students Will Have Service

The Board of Education of Chautauqua, N. Y., has signed the guarantee agreement with the Chautauqua Traction Company which provides for the operation of one passenger car for the purpose of transporting school children and for such additional cars as may seem wise. This is the result of negotiations between representatives of the Chautauqua Board of Education and officials of the traction company, following the petition of the company for permission to abandon service between Ashville and Mayville. It was said at the time the proposed agreement was under consideration that it would not involve a withdrawal of the petition pending before the Public Service Commission for consent to abandon the line between Ashville and Mayville.

It is the intention of the agreement which the parties that are concerned now proposed entering into to maintain the most economical schedule possible. The agreement also provides that the school district will pay all deficit in actual operating expenses to the end that the Chautauqua Traction will not suffer any direct loss from such operation. This payment does not include any salaries for general offices, charges for depreciation, interest on investments or the funded or unfunded debts of the company, or any allowance or sums for accidents. The agreement will continue in force from month to month until canceled by one or the other party by ten days written notice. The present agreement is effective for 30 days from Jan. 11.

Reference to the proposed abandonment of the Mayville line was made in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 19, 1925, p. 1094. At the hearing in Buffalo on Jan. 4 before the Public Service Commission George R. Raynor, principal of the Chautauqua High School, testified that there was 10.8 miles of the 13.4 that was proposed to be abandoned in the school district. He pleaded for a continuation of a service upon which 144 students were solely dependent. Later negotiations looking toward limited service were started.

Fare Agreement in Spokane

New fares of 10 cents cash with five tickets for 35 cents were granted to the Spokane United Railways, Spokane, Wash., by the Department of Public Works of Washington at Olympia on Jan. 23, two days after a formal hearing at Olympia, where officials of the city of Spokane protested the increase. School tickets will remain at 50 for $2. Transfers will remain free, but the age limit of children carried free is raised from four to five years. The new fare schedule will become effective on Feb. 1. It will replace a 7-cent cash fare with five tickets for 30 cents.

Fare discussion has been going on in Spokane since last October, when the company filed notice of increased rates. The company first sought a 10-cent cash rate with a ticket fare of thirteen for $1. An agreement between the management of the railways and the city resulted in a modification of this petition with the filing of a 10-cent cash fare and a 7-cent ticket rate.

Zone Changes in Columbia

Consolidation of Nos. 1 and 3 fare zones of the Columbia Railway, Gas & Electric Company, Columbia, S. C., into a single zone is provided in an order recently issued by the South Carolina Railroad Commission. The order also extends the northern limits of Zone 1 by approximately eight blocks. The change was effective Jan. 10.

The fare zone system, designed by the Railroad Commission to increase if possible the company's revenues, was started on Dec. 16, but, according to reports recently made public, failed to produce the results desired. As was told in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 26, 1925, page 1125, the commission divided the system into five zones with a 5-cent fare in each zone. The old fare had been 7 cents with 3 cents additional for transfers.

Fewer Accidents in Los Angeles

On the lines of the Los Angeles Railway, Los Angeles, Cal., there were 3,050 fewer accidents in 1925 than in 1924 although more miles of street car service were operated. In 1925 there were 20,244 accidents, against 23,294 the previous year. According to *Two Bells*, the official paper of the Los Angeles Railway, the improvement was consistent throughout the year. Most of the accidents were caused by collisions of automobiles and street cars. There were 15,118 such accidents in 1925, compared with 16,799 in 1924. A reduction in collisions with pedestrians from 514 in 1924 to 325 in 1925 is attributed to the restriction of jay-walking in the downtown district.

News Notes

New Paper to Tell of Memphis Doings.—Tri-Service News is the name of a new paper that has just been issued by the Memphis Power & Light Company and the Memphis Street Railway of Memphis, Tenn. It is a monthly and will deal primarily with the problems of the employees. The first issue carries a review of the development by the two companies during the past year and a statement of the program for 1926. Paul Renshaw, advertising manager of the companies, is editor.

Pass System Continued.—The Tacoma Railway & Power Company, Tacoma, Wash., has again been given an extension of its permit to continue the weekly pass system at $1.25 a week, the permit covering the quarter ended April 25. Although the company has had the pass system in use for nearly four years, a portion of which time the passes sold for $1 each, it has operated the system as a temporary proposition on quarterly permits from the State Department.

Philadelphia Will Not Appeal Decision.—The decision of the Public Service Commission in upholding the Philadelphia Rapid Transit Company's petition for maintenance of the 7½-cent fare rate will not be appealed by the city. Mayor Kendrick of Philadelphia, Pa., made this fact known on Jan. 20. The Mayor defined the city's attitude shortly before he left City Hall with Charles B. Hall, president of the Council and City Solicitor Gaffney to attend a Sesqui-Centennial meeting. Mr. Gaffney would not express any opinion until he had looked over the ruling.

Election on Public Utility Control.—The East St. Louis, Ill., City Council on Jan. 18 passed a resolution instructing the city counselor to circulate petitions for an election to determine whether the public utilities within the municipality should be placed under control of the city. A state statute provides for the assumption of such control by referendum vote. The action is being taken, the resolution states, as the result of numerous complaints made to the City Commission of unfavorable decisions by the State Commerce Commission.

Referendum on Purchase Legal.—A referendum on the proposal of the City Council of Seattle, Wash., to purchase the Seattle & Rainier Valley Railway is legal, according to a ruling of Corporation Counsel T. J. L. Kennedy. The question had been raised as to whether the residents of the entire city could sign petitions for a referendum vote on the purchase of the valley line. Mr. Kennedy said there was no such thing as a "regional referendum," claimed by some in favor of the purchase, who held that only the people of the valley were entitled to participate in a referendum. The railway purchase is being held up by a referendum petition being checked by Harry W. Carroll, City Comptroller.

Railway Needs Help.—At a meeting of the directors of the Chamber of Commerce at Owensboro, Ky., a committee was named to take steps to aid the Owensboro City Railroad. G. M. Millican, general manager, in a communication, reported that despite rigid economy, the company continued to lose money. The system has been in the hands of W. A. Carson, Evansville, as receiver since 1923. A saving has resulted, Mr. Millican reported, as a result of the city municipal plant supplying current for the operation of the cars. A 7-cent fare is charged.

May Operate Mozart Line. — The Wheeling Traction Company, Wheeling, W. Va., has been asked to take over the City Railway line in Wheeling to Mozart Hill, an agreement to that effect having been discussed at a meeting of the joint Council, a citizens' committee and officials of the traction company on Jan. 20. The Wheeling Traction Company stated it would consider the offer recently made by the committee provided the latter reconsiders the present traction franchises. Under the terms of the offer made by the city, the Wheeling Traction Company could operate the line for a period of three months and if during that time the service proves unprofitable the line could be returned to the city. If possible an appointed committee will effect a plan whereby all lines of the Wheeling Traction Company in the city of Wheeling can be operated under one franchise.

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Recent Bus Developments

Discussion of Bus Renewed in Buffalo

H. H. Melville, president of the American National Omnibus Corporation, New York City, has assured Mayor Schwab and the City Council at Buffalo, N. Y., that the company will appear before the Public Service Commission at an early date to urge its case for the right to operate 5-cent bus lines in Buffalo. The company already has its franchise from the city for operating thirteen routes over 71.5 miles of streets.

He explained in a letter to municipal authorities that it was found that the manufacturing and financial capacity oi the Gray Manufacturing Company, Detroit, was not equal to the requirements of the large amount of business under negotiation and accordingly new arrangements were made which has resulted in the organization of the American Bus & Truck Company, Inc. The assets of this company are more than $3,500,000, of which $900,000 is cash working capital, and which has no liabilities of any kind except its capital stock. This company is now completely organized and the plant at Springfield, Ohio, formerly owned by the Kelly-Springfield Truck Company, has been purchased and is in possession of the new company. In this connection it was necessary for the American National Omnibus Corporation to transfer its American rights in the Tilling-Stevens United States patents. This transfer was made in London last month and Ernest M. Howe, Detroit, who secured the Buffalo bus franchise, will return from England within a very short time with all details completed.

Associates in the new bus enterprise in Buffalo are William Schall of Schall & Company, New York; Gerard P. Tameling, Tameling, Keen & Company; Frank Hagemeyer and Charles P. Norcross, vice-president of O. J. Gude, outdoor advertisers.

There is much opposition to the institution of a 5-cent bus service in Buffalo by outside capitalists. The Buffalo Chamber of Commerce believes the move is made to discredit the International Railway Company and its subsidiary, the International Bus Corporation, which now operates three lines in the city. N. Loring Danforth, president of the Buffalo Chamber of Commerce, has sent a letter to the municipal authorities saying the new bus interests should show their good faith by filing their financing plan at once with the commission and take steps to bring about an early hearing on their application for a certificate of convenience and necessity from the state utilities board.

Withdraws Request for Bus Extension.—Withdrawal of its request for permission to operate buses as an extension of its car service along Summit View Road, between Walker Avenue inside the city limits of Yakima, Wash., to Englewood Avenue outside the city, has been filed by the Yakima Valley Transportation Company with the Department of Public Works. The withdrawal has been allowed.

El Paso Supplies Rail-Bus Service to Lower Rio Grande Valley

An extensive rail-bus service to Clint, Ysleta, Fabens, Tornillo and other points in the Lower Rio Grande Valley, south and east from El Paso, Tex., is being supplied by the El Paso Electric Company. The combined service extends 45 miles east of El Paso. The interurban cars of the company run as far as Ascarate, which is 6 miles out of El Paso. At this point the transfer is made by passengers under a covered depot to the valley buses, incoming passengers to change at this station from the buses to the interurban cars and continue on into El Paso. The present interurban tracks from Ascarate to Ysleta, a distance of 7 miles, will be abandoned. It is said this will not occasion any inconvenience to former interurban passengers between these points as the bus service from Ascarate eastward is along a concrete highway which parallels the interurban.

The interurban cars in this service are painted a bright green with red roof and sash. The buses in this service are Reo, 20-passenger intercity type, with front entrance and exit door. They are painted gray with blue stripings and on the side of the buses are the words "Lower Valley King Cotton Express." The combined interurban and bus service started on Nov. 19, 1925, and it is believed will solve successfully the problem of adequate transportation service in the lower Rio Grande Valley.

In addition to its interurban service the company in December, 1925, passed an ordinance to supplement its railway service within the city of El Paso with buses.

South Bend Company Seeks Three-Cents-a-Mile Bus Fare

The Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has petitioned the Public Service Commission of Indiana for an increase of ½ cent a mile in the basic rate of fares on the intercity buses. Fares on bus lines within the city of South Bend would not be affected. The intercity buses operate between South Bend and the Indiana Michigan state line and from South Bend to Goshen, through Mishawaka, Elkhart and to Laporte. The company cites figures showing that between Oct. 10 and Dec. 31, 1925, a loss of $7,228 was incurred as a result of the present rate of 2½ cents.

Since October, 1925, the basic rate per mile as approved by the Public Service Commission has been 2½ cents, with a 25 per cent reduction for commutation tickets. All passengers paid per mile. The present petition would establish 5-cent zones for short hauls, with a minimum fare of 10 cents. Under the proposed plan twelve commutation tickets would be sold for $1 and a $5 coupon book for $3.75.

The petition states that if a safe, efficient and dependable service is to be given and taxes paid an increase in the basic rate of fare must be allowed. Officials of the company claim that the ½-cent per mile increase sought would be sufficient to care for both operating expenses and returns on the investment. The rate war which was conducted between competing companies is generally blamed for the fact that revenues failed to meet expenses. This dissension some months ago caused several smaller bus companies to go out of business, but the Jahns bus lines and the interurban company made an agreement whereby part of the service offered by each was rearranged.

New Line Lowers School Fare.—The Public Service Commission has approved as of Jan. 18 the establishment of a new bus line by the Utica Railway Co-ordinated Bus Line, Inc., beginning at Genesee Street and Main Street, in Utica, and extending to Clark Mills. Fares for pupils attending day schools are 10 cents where regular fare is 15 cents or 20 cents; 15 cents where regular fare is 25 cents or 30 cents; 20 cents where regular fare is 35 cents. Minimum fare between any two stops is 10 cents.

Permission to Run Buses.—The Council of Salamanca, N. Y., has granted the Olean, Bradford & Salamanca Bus Lines, a subsidiary of the Olean, Bradford & Salamanca Railway, a franchise to run between Salamanca and Little Valley and the Allegany State Park.

Buses May Supplant Four-Mile Line.—The Denver & South Platte Railway, operating between Englewood and Littleton, Col., a distance of about 4 miles, has organized the Denver & South Platte Transportation Company as its subsidiary. The subsidiary specifies buses, and if it can get a permit for the buses and permission to substitute them for the tramway operation of the railway will be abandoned. Travel over the line is light. Connection is made by the Denver Tramway at Englewood.

Service in Portland Extended.—The Portland Electric Power Company has added another bus line to its supplementary service in Portland, Ore. This is to be known as the Powell Valley Road line and will operate in the vicinity of Powell Valley Road over East 82d Street to Kendall station.

Will Supplement Rail Service with Bus.—The Asheville Power & Light Company, Asheville, N. C., will supplement its railway service between West Asheville and the main business district of the city with two eighteen-passenger buses on a fifteen-minute schedule. The fare will be 10 cents with no transfer privileges. The company for some time past has been maintaining a bus service to the end of the street car line in West Asheville, carrying passengers as far as the entrance to Sulphur Springs on a half-hour schedule. The new service is expected to be of benefit to the West Asheville residents.

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Financial and Corporate

Radial Troubles Explained

Toronto Paper Resents Statements Made in Recent Issue of "Tulley Talks"

As the Toronto *Daily Star* sees it, the two greatest problems which Toronto faces to-day are the deficits on its harbor and the deficits on its radial railways. That authority says the annual deficit on the radials is due chiefly to an obvious and curable cause —their operation as isolated units by a commission which has nothing whatever to do with the city system in which they would naturally center. The *Star* says that if the radials had been operated in 1924 at T. T. C. costs there would have been a saving of $255,000 to offset the reported deficit of $248,000. It was on the basis of such facts that Mr. Cameron sought election to the mayoralty on a straight platform of T. T. C. operation. The *Star* said that a vote for Cameron as Mayor and for Gibbons, McBride, Whetter and Robbins as controllers was a vote to stop the radial deficits by giving the radials to the T. T. C. to operate.

Incidentally, that paper was led into a general discussion of the whole matter as a result of a quotation in the ELECTRIC RAILWAY JOURNAL from a recent issue of "Tulley Talks," published by Mitten Management, Inc., at Buffalo. The statement by Mr. Tulley said:

> Toronto, under municipal operation, concerning which much has been said as to the kind of service and the cheapness of the fare, is also proving a disappointment in that the taxpayers are already being called upon to pay large sums of money to make up for the losses sustained in carrying the people at less than actual cost.

The fact is that outside the city Toronto owns the York radials. These lines are operated for Toronto by the provincial Hydro commission at an annual loss to the taxpayers of nearly $250,000. Inside the city Toronto owns the whole street railway system. It is operated for Toronto by the Toronto Transportation Commission without the loss of a dollar to the taxpayers. The *Star* says that in efficiency of service and in financial soundness it is a splendid advertisement for public ownership, but that the advertisement is marred by the failure of the radials. Here's how the *Star* explains the matter:

> The losses made by the radials under provincial Hydro management are attributed to the city system under T.T.C. management. It is an unwarranted reflection on the T.T.C., which has never yet operated at a loss. But if the garbled statement is a reflection on the T.T.C., the truth is a reflection on the Hydro, and public ownership again suffers. It suffers unnecessarily. For the deficits arise from an unnecessary condition. No management could make the three radials pay when they are separated from the city system and from each other, with consequent quadruplication of equipment, barns, yards and shops, and absence of a "through" service to the center of the city. But by giving the radials to the T.T.C. to operate, all these disadvantages disappear, and the deficits disapper with them.
>
> Operation of the Toronto-owned radials by the Toronto Transportation Commission will therefore have the following beneficial effects:
>
> 1. It will take a burden of $250,000 a year off the shoulders of the Toronto taxpayers.
>
> 2. It will relieve the Hydro of the discredit of operating radials at a loss.
>
> 3. It will relieve public ownership of this reproach. In fact, it will strengthen public ownership. For the T.T.C. will wipe out the deficits.
>
> 4. It will give radial users and radial express a "through" service to and from the center of Toronto, and Toronto and the surrounding country will profit by the trade thus developed.
>
> 5. The T.T.C. will profit by the rentals charged the radials for use of tracks, barns, etc., within the city, while the radials will profit by paying only once for these, instead of paying for duplicated and triplicated facilities.

Sale of Ohio Properties Approved

Sale of the properties of the Cincinnati & Dayton Traction Company, including the main line from Cincinnati to Dayton and the Hamilton city lines, now in the hands of George P. Sohngen, receiver, has been approved by the Court of Appeals at Hamilton, Ohio. The receiver has been ordered by the court to pay all claims against the company so as to facilitate the sale. The receiver holds cash and securities amounting to $777,067.

A reorganization plan has been approved and adopted by the protective committee representing the holders of the first and consolidated mortgage 5 per cent bonds of the Southern Ohio Traction Company and the holders of the first 6's of the Cincinnati & Hamilton Street Railway, included in the Cincinnati & Dayton system.

San Francisco Municipal Loss $305,162

For Year Ended June 30, 1925, the Excess of Income Over Operating Expenses, Interest, Depreciation and Accident Reserves Was $6,385, but Taxes and Similar Charges Amounted to $311,548

TOTAL revenue of the Municipal Railway, San Francisco, Cal., for the year ended June 30, 1925, was $3,281,498. Interest on securities owned increased this by $44,595, to $3,326,093. Deducting operating expenses of $2,544,720 left net of $781,372. Against this $186,678 was charged for interest on funded debt and $588,308 for reserve for depreciation and for accidents, leaving a balance of $6,385, compared with $8,374 for the previous year.

For the purpose of securing a comparison between the results of operation of the municipally owned utility and similar utilities operated by private capital, the charter of the city and county of San Francisco provides that the operating reports shall include certain comparison charges consisting of items which constitute part of the actual cost of operating privately owned companies, but which the municipally owned utility is not required to pay. For the year these charges amount to $311,548, leaving a net loss of $305,162. This compares with a similar deficit of $295,230 for the previous year.

There has been a continuing deficit, as shown by the cumulative income account for the period from Dec. 28, 1912, to June 30, 1925, amounting to

COMPARATIVE INCOME ACCOUNT, SAN FRANCISCO MUNICIPAL RAILWAY

	Year Ended June 30 1924	Year Ended June 30 1925	Dec. 28, 1912 to June 30, 1925
Passenger revenue	$3,173,181	$3,268,383	$28,683,573
Miscellaneous revenue	16,352	13,115	123 470
Total revenue	$3,189,533	$3,281,498	$28,807,043
Interest on securities owned	46,519	44,595	361,269
Total income	$3,236,052	$3,326,093	$29,168,313
Operating expenses:			
Way and structures	$115,467	$115,073	$914,993
Equipment	187,635	197,619	1,693,105
Power	465,889	464,990	3,834 695
Conducting transportation	1,523,269	1,600,499	12,600,619
Traffic	109	.....	3,836
General and miscellaneous	167,910	166,333	1,130,702
Loss on road retired	.....	.....	8,184
Total operating expenses	$2,460,282	$2,544,515	$20,186 138
Other deductions:			
Taxes—Motor bus	.....	205	205
Total operating expenses	$2,460,282	$2,544,720	$20,186,343
Excess of income over operating expense	$775,770	$781,372	$8,981,969
Less: Interest on funded debt	196,223	186,678	2,561,640
Excess of income over operating expenses and interest	$579,546	$594,694	$6,420,328
Less: Reserve for depreciation and accidents (18 per cent of gross earnings)	571,172	588,308	5,162,145
Excess of income over operating expenses, interest, depreciation and accident reserves	$8,374	$6,385	$1,258,183
Less: Charter comparison charges	303,604	311,548	2,587,732
Net loss	*$295,230*	*$305,162*	*$1,329,548*
Analysis of Comparison Charges:			
*State franchise tax—4½ per cent of gross earnings	$167,442	$172,279	$1,510,832
†Municipal franchise tax—3 per cent of gross earnings	126,927	130,735	954,893
Municipal car license	3,135	3,135	33,393
Federal income tax	.....	.....	13,270
Salary of clerks	.....	.....	4,872
Law expenses	.....	.....	13,500
Insurance	6,099	5,398	56,969
Total	$303,604	$311,548	$2,587,732

*State franchise tax percentage has varied in different years. †Municipal franchise tax now increased to 4 per cent. *Italics* indicate loss or deficiency.

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STATISTICAL DATA, SAN FRANCISCO MUNICIPAL RAILWAY, FISCAL YEAR ENDED JUNE 30, 1925

	Total Amount	Per Car-Mile	Per Car-Hour
Total passenger revenue	$3,268,383.23	$0.3673	$3.5477
Total operating expense (taxes and depreciation not included)	2,544,515.59	0.2859	2.7519
Total operating earnings (taxes and depreciation not included)	723,867.64	0.0813	0.7858
Ratio of earnings to passenger revenue	0.2215		
Total taxes and charter charges	311,753.11	0.0350	0.3384
Ratio to passenger revenue	0.0954		
* Depreciation	588,308.97	0.0661	0.6386
Ratio to passenger revenue	0.1800		
Operating expenses, depreciation and taxes	3,444,577.67	0.3871	3.7389
Ratio to passenger revenue	1.0539		
Net deficit from operation	*176,194.44*	*0.0198*	*0.1912*
Ratio to passenger revenue	0.0539		
§Passenger car mileage	8,897,271		
†Passenger car-hours	921,283		
Platform expense (67½ cents per hour; time and one-half for overtime after eight hours, and after ten hours range, time and one-half for seventh day work; twelve days vacation per year with pay). Bus operators, 72½ cents per hour, same conditions as platform men	1,332,652.65		

Number of passenger cars owned	209	Free passengers (employees, etc.)	618,830
Number of work cars owned	6	Total passengers carried	79,900,645
Total number of cars owned	215	Number of passengers carried per car-mile	8.98
Total number of buses owned	10		
Total number of cars and buses owned	225		
Passengers carried—5-cent fares	64,783,403		
5-cent fares—Government tickets	43,952		
2½-cent fares—School tickets	1,009,735		
‡2-cent revenue transfers	392,016		
Free transfers	13,142,709		

* The sum of $201,000 expended from depreciation reserve funds for bond retirement.
§ Includes mileage of buses.
† Includes car-hours of buses.
‡ Transfers lifted at Fillmore and Union Streets, treated as revenue transfers pending result of present crossing litigation.
Italics indicate loss or deficiency.

$1,329,548 when the comparison charges are included. Omitting these from consideration, there has been an excess of income over operating expenses, interest, depreciation and accident reserves of $1,258,183.

As in previous reports, particular attention is given to the explanation of the items in the balance sheet, which is reproduced in condensed form herewith. Capital assets consist of road and equipment, $7,992,410, and general expenditures, $324,872. Thus the total cost of road and equipment was placed at $8,317,283. Current assets consist of $943,517 of securities bought for the drepreciation fund, $15,185 in accounts receivable and $153,523 for materials and supplies. The item of deferred assets, some $132,123, did not change during the year. Thus the total of assets was $10,595,543. On the liability side the funded debt item represents the par value of bonds outstanding in the hands of the public on June 30, 1925. Current liabilities include accounts and vouchers payable, $339,763, and interest due on funded debt, $44,231. The reserves include a reserve for depreciation of $1,373,288 and a reserve for compensation insurance of $102,855.

The Municipal Railway has no capital stock and the excess of its assets over its liabilities represent surplus. In a preparation of a balance sheet this surplus has been divided into two classes: First, that which was created by donations or contributions, and, second, that which has accumulated from the earnings resulting from the operation of the road. The contributed surplus includes premiums from the sale of bonds, $26,000, and contributions from general taxes, $306,552. In surplus from income is included $1,791,000, representing the income which has actually been set aside for the redemption of bonds. Of this amount the item of $1,690,000 represents bonds redeemed and canceled and the item of $101,000 was cash.

An item of considerable interest to railway operators is the charter reserve of $1,119,471 for insurance and taxes. As explained previously, there are set aside certain sums for comparison with private operation, of which this item is a part. The municipal system not having to pay any of these charges, the receipts from operations were deposited in the operating cash fund without any restrictions as to how they were to be used. As a matter of fact, most of the cash in the operating fund, represented by such comparison charges, was actually expended in new construction and addition and betterment work, so that these reserves representing obligatory comparison charges have in reality been used as reserves for betterments. For the purpose of making the balance sheet reflect the actual results of operations, the amount expended in addition and betterment work has been reflected in an account entitled "Additions and Betterments from Income," and the charter reserves for insurance and taxes carry a balance equal only to the unused portion of the original reserves.

The amount included in the additions and betterment account is $2,651,573. This account represents the value of construction and addition and betterment work performed out of the funds derived from the operation of the road.

Operating surplus of the San Francisco Municipal Railway is made up as:

Operating surplus		*$1,052,316*
The following is an analysis of the above figure:		
Surplus June 30, 1924		*$768,481*
Add: Transfers from depreciation fund to operating fund to cover deficits in the latter		74,093
		$694,398
Deduct: Amount transferred from income account	*$694,398*	
Interest on securities credited to income but deposited in depreciation fund	44,595	
Internal revenue tax on motor buses for hire for years 1920 to 1924	820	
Adjustment — Replacing cable in Twin Peaks Tunnel	7,351	357,929
Total		*$1,052,316*
Total surplus from income		$4,611,851
The total surplus derived from the operations of the road is as follows:		
Bonds retired through income		$1,690,000
Reserve for bond redemption		101,000
Advance general fund — Twin Peaks Tunnel		82,152
Advance general fund—Stockton Street Tunnel		48,971
Advance general fund—Ocean Shore Railroad switching		1,000
Charter reserves		1,119,471
Additions and betterments from income		2,621,573
Operating surplus		*1,052,316*
Total		$4,611,851

STATEMENT OF BUS LINE OPERATIONS, SAN FRANCISCO MUNICIPAL RAILWAY, YEAR ENDED JUNE 30, 1925

Revenues:		
Passenger earnings	$40,765	
Q. M. tickets	6	
School tickets	771	
Local transfers	13,628	
Total revenues		$55,172
Operating expenses:		
Repairs to buses	$9,385	
Tire expense	8,236	
Garage expense	18,155	
Conductors and chauffeurs	27,742	
Depreciation (18 per cent of receipts)	7,337	
Compensation insurance	1,097	
Motor bus tax	205	
Total operating expenses		72,160
Net loss for year		$16,987
Average net loss per day		46.54

COMPARATIVE CONDENSED GENERAL BALANCE SHEET, SAN FRANCISCO MUNICIPAL RAILWAY, AS OF JUNE 30, 1925

Assets	1925	1924	Increase or Decrease
Capital assets	$8,317,283	$7,912,526	$404,756
Current assets	2,146,137	2,174,925	*28,788*
Deferred assets	132,124	132,124	
Total assets	$10,595,544	$10,219,576	$375,968
Liabilities, Reserves and Surplus:			
Funded debt	$3,791,000	$3,992,000	*$201,000*
Current liabilities	383,996	269,720	114,275
Reserves	1,476,144	1,568,470	*92,326*
Contributed surplus	332,553	332,553	
Surplus from income	4,611,852	4,056,833	550,019
Total surplus	$4,944,405	$4,389,386	$555,019
Total liabilities, reserves and surplus	$10,595,544	$10,219,576	$375,968

Italics indicate loss or deficiency.

The net loss on bus operation was $16,987, compared with $19,861 for the previous year. These figures, however, do not include any supervision or other overhead or comparison charges.

The total single track mileage as of June 30, 1925, was 69.40. The total bus route mileage as of that date was 5.42.

Indianapolis Property Reported in New Insull Deal

Announcement was made at Chicago on Jan. 27 of an impending deal which will bring under Insull control the Terre Haute, Indianapolis & Eastern Traction Company, including the Indianapolis Street Railway. These properties will be merged with the Central Indiana Power Company. Mr. Insull was reported to have said that the interests he represented were not going into the consolidation primarily from the traction point of view, but that with their traction lines in northern Indiana and the Interstate Public Service Company's line from Indianapolis to Louisville closer traction relations were certain, with through interurban service possible from Chicago to Louisville.

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Atlanta Company in Southeastern System

Individual shareholders owning substantially more than a majority of the total outstanding common capital stock of the Georgia Railway & Power Company, Atlanta, Ga., have agreed to accept in exchange therefor 1.633 shares of cumulative participating preferred stock and one share of non-par value common stock of the Southeastern Power & Light Company for each share of Georgia Railway & Power Company common stock owned by them. When completed this exchange will bring under centralized, unified and co-ordinated ownership and management the Alabama Power Company (a subsidiary of Southeastern Power & Light Company) and the Georgia Railway & Power Company.

The Alabama Power Company and Georgia Railway & Power Company will continue as individual operating companies, with their own organizations and management, under the local state laws, maintaining their own financial structures and subject to public regulations as to rates and security issues within the respective states served. The present policies and management of the Georgia Railway & Power Company will continue. No change in the organization personnel is contemplated.

The agreement reached will make possible more effective and continuous use of present operating water power and steam plants, and will result in future co-operative development of water power in the various water sheds of Georgia and Alabama.

In addition auxiliary steam power generated to the extent necessary at the mouth of the Alabama coal mines will be connected by wire with and made available throughout the territory served, a condition of great economic and industrial advantage.

Milwaukee Company Calls 8 per Cent Issue

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has called for payment on March 1 the $3,000,000 of 8 per cent preferred stock sold by it locally to its customers in 1921. Holders have the option of turning in the stock on March 1, on which date the dividend is payable, and receiving their principal and a bonus of $3 a share or of receiving in lieu of the 8 per cent stock a similar amount of the company's 7 per cent issue. It would appear from the terms of the offer of exchange that an additional amount of the 7 per cent stock is shortly to be issued.

The company will reduce its funded debt by $6,500,000 on Feb. 1 by the payment of its consolidated first mortgage bonds due on that date. This maturity will be met without the issuance of any new bonds. The cash required will be provided by the issuance and sale of $3,750,000 additional common stock and by local sales of preferred stock, and, to such extent as may be necessary, by cash advances by the parent North American Company. Upon the retirement of this issue, only about 57 per cent of the company's total capitalization will be represented by mortgage bonds and the value of the company's property will be more than double the amount of all mortgage bonds outstanding.

Interurban Offers a $5,000,000 Issue

Changes in the financial structure of the Chicago, Aurora & Elgin Railroad, Aurora, Ill., were made public on Jan. 27 with the announcement of an offering by Halsey, Stuart & Company, Inc., of an issue of $5,000,000 first and refunding mortgage 6 per cent bonds, at 96 and interest, yielding more than 6.30 per cent. Part of the proceeds will be used to refund the $750,000 of 6½ per cent notes due next December, the $1,050 000 bonds due in 1947, and also for the purchase of approximately $2,000,000 of first mortgage 5 per cent bonds due in 1941. This will place the company in an unusually strong position.

As part of the plan the Chicago, Aurora & Elgin Railroad will be incorporated in Illinois as successor by consolidation to the present company of the same name. The company will own 103 miles of line, measured as single track. For the twelve months period ended Nov. 30, 1925, gross revenue of the company was $2,699,900. Net earnings during the same period before depreciation were $665,734, as compared with the annual interest of $310,150 on the company's funded debt to be outstanding in the hands of the public upon completion of this financing.

Protective Committees for Chicago Street Railways

Plans are fast being perfected to protect the holders of securities of companies embraced in the system of the Chicago Surface Lines. Early in February Leonard A. Busby, president of the Chicago City Railway, stated before the City Council transportation committee that protective committees of security holders were being formed. Now Frank O. Wetmore, chairman of the board of the First National Bank, bankers for the South Side lines, says that the personnel of the committees will be made known soon. It is known that four committees are being organized, of which the two principal committees will be these:

First—For the protection of $60,000,000 underlying bonds of the Chicago Railways Company; chairman, A. W. Harris, Harris Trust Company.

Second—For the protection of the $40,000,000 underlying bonds of the Chicago City Railway and the Calumet & Southern; chairman, Frank O. Wetmore, First National Bank.

A third committee will protect the junior securities of the Chicago City & Connecting Railways; chairman B. E. Sunny.

That leaves one committee to be formed—the committee to protect the securities of the West Side properties.

Prior to the consolidation of the properties in 1907 the Chicago City Railway had no bonded indebtedness, and the only securities outstanding were $18,000,000 in stock. Of this amount the Morgan house bought shares having a par value of $17,000,000.

$457,109 Surplus for Interborough for Six Months

For the six months ended Dec. 31, 1925, the total revenue of the Interborough Rapid Transit Company, New York, N. Y., from all sources was $30,167,690, an increase of $1,614,977 over the corresponding period of 1924. This increase is largely accounted for by the receipt in July, 1925, of a cash payment of $770,000 as part consideration for the new advertising contract, which became effective Nov. 1, 1925. There was no similar payment in the previous year. Operating expenses, taxes and rentals paid to the city for the old subway increased $766,855. Income deductions increased $142,496. The net result for the six months was a surplus of $457,109. This represented an improvement of $705,625 compared with the corresponding period of 1924, due chiefly to the new advertising contract.

Conestoga Traction Properties in Deal

Purchase of control of the Lancaster County Railway & Light Company, Lancaster Pa., and of the Harrisburg Electric Light Company, Harrisburg, Pa., is announced by the Lehigh Power Securities Company. Included in the deal are 162 miles of electric railway operated by the Conestoga Traction Company, the common stock of which is owned by the Lancaster County Railway & Light Company.

The Lehigh Power Securities Corporation has sold to bankers an issue of $25,000,000 of 6 per cent gold debentures, series A, due Feb. 1, 2026, the proceeds to be used to retire $7,566,000 outstanding Lehigh Power ten-year 6 per cent secured gold notes, to finance the purchase of the new properties and other purposes. The United Gas & Electric Corporation is to receive for the Lancaster and Harrisburg properties Lehigh Power's present outstanding issue of $13,000,000 of $6 cumulative preferred $100 par stock and about $10,000,000 in cash.

After disposal of the properties the United Gas & Electric Corporation is to be absorbed by the Empire Power Corporation.

Preliminary Figures at Grand Rapids

E. J. Bechtel, New York, was elected a director and a vice-president of the Grand Rapids Railway, Grand Rapids, Mich., at the annual meeting on Jan. 26. Other directors and officers were re-elected. The annual report, as furnished the city, showed total earnings for 1925, including miscellaneous items, of $1,738,779 a decrease of $32,553 compared with total receipts for 1924. Operating expenses were $1,172,157, an increase of $72,982 compared with 1924 and largely due to rental of cars by the company because of stock destroyed in the fire at the Hall Street carhouse and to high maintenance charges.

Arrival of 27 new cars about April 1 is expected to improve the situation. The number of revenue passengers carried during 1925 was 23,947,305 or a decrease of 877,713 compared with 1924.

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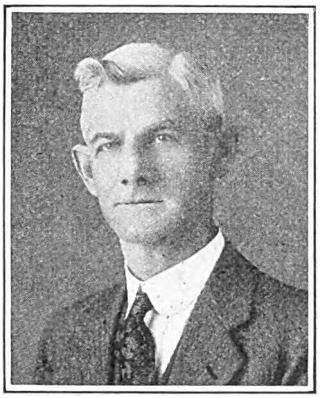
Personal Items

F. J. Linforth Promoted

Superintendent of Employment at San Francisco Made Assistant to General Manager

Frank J. Linforth, superintendent of employment and training of the Market Street Railway, San Francisco, Cal., has been appointed assistant to M. McCants, general manager of that company.

Much of the success of the company's personnel policy is attributed to Mr. Linforth's close application to the solution of this problem. Each section of the country has problems that are largely its own in this matter, but so far as the Market Street Railway is concerned it has succeeded in cutting down labor turnover materially. The complete picture in figures cannot be given here, but since Mr. Linforth became inspector of applicants in 1910 more than 18,000 men have passed through his hands, so to speak. For the last three years all the men hired have taken a training course. Perhaps still more to the point in some respects is the fact that at the start of the new system of training in 1923 the probationer's examination was taken voluntarily by all motormen and conductors.



F. J. Linforth

But there is another angle to the matter. Mr. Linforth has edited the company's magazine, the *Inside Track*, since its inception in March, 1922. He will continue in his capacity of editor. This is good news for the men and women of the company, for he has made the *Inside Track* one of the very best of its kind. That publication is edited in a way that indicates keen insight on the part of the editor into the needs of the men and women of the system, shows rare good taste and reflects a humanitarianism based on wide contact with men and events over a long period of years.

Mr. Linforth entered the employ of the Market Street Railway as a conductor in September, 1908. In June, 1910, he was detailed to the Turk and Fillmore office as night clerk and was in succession day clerk, investigator and inspector of applicants in the employment department. In July, 1923, he was appointed superintendent of employment and training.

Before going to the Market Street Railway he had been a captain of constabulary in the Philippine Islands. He went to the Philippines as a volunteer during the Spanish-American War. He was educated at Notre Dame University.

J. P. Dick and C. E. Bennett Promoted in Atlanta

Jackson P. Dick, formerly assistant to the vice-president and general manager of the Georgia Railway & Power Company, Atlanta, Ga., has been promoted to assistant general manager.

Mr. Dick has been with the Georgia Railway & Power Company since 1919 as purchasing agent for the department of development and shortly thereafter was made purchasing agent for the entire company. In July, 1924, he was promoted to assistant to the vice-president and general manager. This position he has held up to Jan. 1, 1926, when he was made assistant general manager. Mr. Dick was graduated from the University of Georgia in 1908. At one time he was connected with the Texas Company.

C. E. Bennett, electrical engineer, has been appointed manager of the company's electrical department.

G. S. Davison New President of A.S.C.E.

George S. Davison has been elected president of the American Society of Civil Engineers for the year 1926. He is well known in electric railway and in rapid transit circles. Back in 1897 Mr. Davison became chief engineer of the Monongahela Street Railway System, which operated 70 miles of track in Pittsburgh and neighboring communities. He built the Pittsburgh & Charleroi Street Railway. In 1901 he became the general manager and director of the Pittsburgh & Birmingham Traction Company, serving the section of Pittsburgh south of the Monongahela River. In 1905 and 1906 he directed the construction of the Allegheny Valley Street Railway from Aspinwall along the Allegheny River to Natrona. In a consulting capacity he investigated and reported upon many interurban street railways for financial purposes.

Mr. Davison was born in the Lawrenceville section of the city of Pittsburgh in 1856. He was graduated from the Rensselaer Polytechnic Institute at Troy, N. Y., in 1878, with the degree of civil engineer. At the present time he is a member of the Planning Commission of the city of Pittsburgh and chairman of the Transit Commission of the city of Pittsburgh. He has been a member of the American Society of Civil Engineers since 1890. He served it as a director and vice-president previous to his election as president.

W. C. Campbell in New Post

Duties of Tennessee Official Widened and More Closely Defined—Man of Wide Experience

W. C. Campbell, formerly assistant to B. C. Edgar, new president of the Tennessee Electric Power Company and the Nashville Railway & Light Company, was placed in charge of all operations in the communities outside of Chattanooga and Nashville, effective Jan. 1. The position is a new one and comes as a result of the continual expansion of the company's business throughout middle and eastern Tennessee.

The new executive has been associated with various branches of the public utility business for the past 25 years. Early in his career he served a year and a half in the test department of the General Electric Company at Schenectady, and was sent by this concern to New York City to supervise the installation of car equipment for the New York subways. With the exception of one year spent as general carhouse foreman of the New York Railways, he remained in New York City with the General Electric Company until 1909, going from there to the Pacific Coast for construction, engineering and sales work.

W. C. Campbell

In 1914 he left the General Electric Company and returned East to become assistant general superintendent of the Columbus Railway, Power & Light Company, Columbus, Ohio. He became general superintendent in 1918. It is at this point that Mr. Campbell recalls to mind the Campbell-Clapp combination. H. W. Clapp, another engineer executive, was promoted to the general managership of the Columbus property at the time that Mr. Campbell succeeded to the post of general superintendent, previously occupied by Mr. Clapp. The careers of both men were reviewed in the ELECTRIC RAILWAY JOURNAL of Dec. 28, 1918. It was said at that time that both Mr. Campbell and Mr. Clapp would retain their interest in electrical engineering matters. It was also said that their experience demonstrated that engineering training need not prove a bar to general administrative work if a man has a talent for such.

One year later Mr. Campbell went to Chattanooga, Tenn., as assistant to B. C.

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Edgar, then vice-president and general manager. He has had charge of all rate matters for the company, insurance and other duties, which he will continue to supervise.

Mr. Campbell is a native of Kentucky. He was graduated from Union College, Schenectady, N. Y., in 1900 and took an additional year of engineering at Purdue University.

P. R. T. Real Estate Manager to Retire

J. A. Patterson, for many years real estate representative of Mitten Management and of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will retire from active service July 1, 1926.

Mr. Patterson, with long experience and observation in the earlier days of transportation development in Philadelphia, has been one of the warmest advocates of co-operation as typified by Mitten Management. His participation with the P. R. T. and Mitten Management will be less active, but they will still have the benefit of his counsel and encouragement.

Albert M. Greenfield & Company, which negotiated the purchase of the Frankford, Tacony & Holmesburg Street Railway by the Philadelphia Rapid Transit will succeed Mr. Patterson.

Ernest Stenger Heads Denver Water Board

Ernest Stenger, who piloted the Denver Tramway, Denver, Col., through receivership and was elected president of the Tramway when it was reorganized, has been selected by Mayor Stapleton to head the Denver Water Board. The position will in no way interfere with his duties as president of the tramway, but is in itself a great honor. The newspapers and citizens were insistent that the Mayor get a man to head the water board who would improve conditions. Mr. Stenger is a degree man in civil engineering from the University of Michigan, has served the Denver & Rio Grande Railroad as a general superintendent, the Union Pacific Railroad as superintendent and is known as a builder.

R. W. Lamar Chief Engineer at Birmingham

Robert W. Lamar has recently been appointed chief engineer of the Birmingham Electric Company, Birmingham, Ala. In this capacity he fills the vacancy caused by the appointment of H. E. Cox to the position of assistant general manager. This appointment was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 14, 1925, page 887. Mr. Lamar has had broad experience in engineering and utility business in the western and central states. He has been connected with the J. G. White Management Corporation and for several years with the Electric Bond & Share Company of New York, and affiliated companies. During the World War he was captain of engineers in the United States Army. Mr. Lamar was born in Indiana. He was graduated from Washington University, St. Louis.

Washington Bus Personnel

Messrs. Merrill and Shapiro Will Operate New North American Subsidiary in Nation's Capital

New officials in the persons of E. D. Merrill and Alexander Shapiro have been named to fill the posts of president and general manager and of assistant general manager respectively of the Washington Rapid Transit Company, a bus company of Washington, D. C. An announcement to this effect was recently made by F. W. Doolittle, vice-president of the North American Company, for whose interest the properties of the former company were recently acquired.

Both appointees are well known in the railway field. For the past two years Mr. Merrill has been traffic engineer for the Chicago Motor Coach Company and the Yellow Coach Manufacturing Company. Back in 1909 he joined the Union Pacific Railroad as assistant engineer, remaining with that road until 1913. A year later he joined the Puget Sound Traction Light & Power Company, Seattle. When he resigned from that organization in 1919 he was traffic engineer. Later he was identified with the Milwaukee Electric Railway & Light Company, a subsidiary of the North American Company, and became assistant superintendent of transportation. From 1920 to 1922 he was with the Philadelphia Rapid Transit Company as traffic engineer and assistant superintendent of transportation. During 1923 he was assigned to special study work for the Boston Elevated Railway, following which he joined the Cincinnati Traction Company as superintendent of schedules. In 1924 he lined up with the Chicago organization.

Mr. Merrill was graduated from the Massachusetts Institute of Technology in 1909.

Mr. Shapiro, who will assist Mr. Merrill in conducting the operation of the Washington Rapid Transit Company, recently went to Washington to make a survey of the lines of that company. At that time he held the position of commercial manager of the Wisconsin Motor Bus Lines, affiliated with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Mr. Shapiro has long been identified with the North American Company. Back in 1922, when the bus operations of the Milwaukee Electric Railway & Light Company, expanded so rapidly that a reliable man was needed to supervise their operations, he was chosen, along with Sylvester Henningfeld. At that time he was statistician and assistant in the executive department of the Milwaukee company. In 1914 Mr. Shapiro joined the staff of the American Electric Railway Association as assistant in the bureau of fare research. He was later retained by the association as assistant statistician and for more than a year was in charge of the association's bureau of statistics and information. In 1919 he was retained by the Committee of One Hundred of the association on work in connection with the Federal Electric Railways Commission investigation. He went to Milwaukee in the spring of 1920 as statistician in the executive department. Later he became interested in operating work and for nearly a year acted as secretary of the company's transportation committee, which passes on all problems arising out of the operation of the company's railway and bus utilities.

Mr. Shapiro was graduated from the College of the City of New York, where he received his preliminary engineering training and where he specialized in statistics, economics and accounting.

Appointment of R. V. Taylor to I.C.C. Reported Favorably

The Senate interstate commerce committee has decided to report favorably the nomination of R. V. Taylor of Alabama to the Interstate Commerce Commission.

An official poll of the interstate commerce committee was declared on Jan. 26 to show nine votes to eight of the Senate for a favorable report on the nomination of Thomas F. Woodlock, New York, who now holds a recess appointment on the Interstate Commerce Commission. After the committee has reported, leaders said, a poll of the Senate would be made, and should it show a majority against the nomination the wishes of President Coolidge would be consulted.

Roy C. Cram Resigns from Brooklyn Company

Roy C. Cram has resigned from the Brooklyn-Manhattan Transit Corporation, with which he has been connected since 1912. At present he is engaged on a special assignment connected with one of the railways in the metropolitan district, but he has not yet fully matured his plans for the future. The new work and some personal matters on which he is engaged, by their very nature, have made it impossible for Mr. Cram to devote to the work of the office of president of the A. E. R. E. A. the time and attention that he had hoped to give to it and so he has resigned his official association affiliation.

Roy Cram has been engaged in electric railway work since 1898. During a considerable part of that time he has been active in state and national railway association affairs. He has also been a frequent contributor to the engineering and technical press. His long career in the industry was reviewed in the ELECTRIC RAILWAY JOURNAL for Oct. 10, 1924, page 634. It is understood that one of the proposals which he has under consideration contemplates his withdrawal to a line of endeavor not connected with railway work on its operating side.

John G. Baukat has returned to the electric railway field in the capacity of consulting engineer for the New York Railways, New York City, N. Y., where he will devote his attention to general designing and development work. For the past few years Mr. Baukat has been occupied in general consulting engineering work, principally designing and superintending the building of trolley car equipment and electric locomotives. Prior to that, from 1921 to 1923, he was president and general manager of the Batavia Car Works, Batavia, N. Y., which he organized and operated until

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other interests bought the company. Mr. Baukat also served as mechanical engineer of the Hydro-Electric Power Commission of Toronto, Canada, in charge of electrifying the London & Port Stanley Railway. This job included the design and construction of all rolling stock and shops. He was also in charge of the equipment and shops of all railway properties controlled and operated by the Hydro-Electric Power Commission in Ontario.

George W. Struble has resigned as claim agent of the Oklahoma Railway, Oklahoma City, Okla., after twenty years in the service of the company. Mr. Struble began as a motorman and earned successive promotions until he reached the position of claim agent of the company. He expects to devote his time to his farm.

R. B. White, general manager of the local division of the Baltimore & Ohio Railroad at New York, included in which is the Staten Island Rapid Transit Railway, recently electrified, has been elected vice-president of the Central Railroad of New Jersey. He is well known among electric railway men and is at present a member of the committee on rapid transit of the American Electric Railway Association.

Charles A. Halbert, in the service of the Wisconsin Railroad Commission since 1913, and now chief engineer of that body, has been appointed State Chief Engineer to succeed Arthur Peabody, resigned.

David A. Ellis, since 1919 a member of the Massachusetts Department of Public Utilities, has resigned and at the close of a Mediterranean trip will devote himself to the practice of law at Boston.

Fred P. Snyder, who has been connected with the Oakwood Street Railway, Dayton, Ohio, since 1922, has been appointed general manager of the company.

R. J. Higgins, attorney for the bondholders of the Kansas City Railways, Kansas City, Mo., has become a law partner of Senator James A. Reed. The firm name will be Reed, Holmes, Higgins & Taylor. Mr. Higgins formerly was counsel for the railways at Kansas City and is a former city attorney of Kansas City, Kan.

W. W. Box, Birmingham, Ala., has been appointed chief clerk in the passenger and freight office of the Oklahoma Railway, Oklahoma City, Okla., succeeding Carl E. Knoepfel, who has accepted a position as rate clerk in the freight office of the Rock Island Railroad.

R. L. Loy, Jr., became claim agent of the Oklahoma Railway, Oklahoma City, Okla., on Jan. 1, succeeding in this capacity George W. Struble, resigned. Mr. Loy went to the Oklahoma Railway from the Rock Island Company, having been with that railroad since 1910 and having served in the claim department since 1913. After finishing school Mr. Loy was employed in a bank for a year. He then began his service with the Rock Island. Here he attracted the attention of the receivers of the Oklahoma Railway. He was born in Effingham, Ill., and went to Shawnee with his parents in 1906.

Obituary

W. H. Maltbie

William H. Maltbie, counsel for the United Railways & Electric Company, Baltimore, and one of the most prominent lawyers of that city, died on Jan. 23 at St. Agnes' Hospital, Baltimore, after an illness of about a week. His death was due to pneumonia. The last important case for the railway in which Mr. Maltbie participated was the valuation hearing held last year by the Maryland Public Service Commission. The decision in this case has not been rendered.

Mr. Maltbie had earned for himself a national reputation as an authority on the question of public utility valuations and as a publicist on this and other questions. He was the author of "The Theory and Practice of Public Utility Valuations," but this work represented only a small part of his contribution to the constructive thinking on this subject. One of the last pieces of writing that he did was the preparation of the article "Valuation Principles in Baltimore Case," contributed by him to the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 9.

W. H. Maltbie

Men marveled at the clearness, force and elegance of the Maltbie contributions to the literature on utility subjects and the oral discussion of such subjects by him, but the answer was not far to seek. It was to be found in the early scholastic training of the man and in his insistence, without being pedantic, that things should be right. Indefatigable industry was at the bottom of it all. As the Baltimore *Sun* so aptly said, vague thinking, loose verbiage, obscure objectives, all were hateful to him. That paper said editorially:

> His sudden, tragic passing causes, therefore, a gap in the life of the city that will not be filled. The ranks appear to close up when such a man crosses the river, but the appearance is deceptive. His peculiar combination of brains, character and diverse, yet deep, training cannot be duplicated. There is no one just like him in our community.

It is impossible to do more than to set down a part of his contribution to the work of the American Electric Railway Association. He was counsel for the association in the railway mail pay case and special counsel for the association in connection with the study of the subject of depreciation of electric railway properties made by the Interstate Commerce Commission with the idea of establishing definite rates to be applied to the various classes of electric railway property. He was also chairman of the committee on special taxes and a member of the committee on traffic congestion.

Seldom is it that a man develops the well-rounded ability that was possessed by W. H. Maltbie. For less than ten years he had focussed his attention on public utilities, yet engineering, operation and finance were so blended with his more intimate knowledge of law that his solution of problems showed a well-balanced appreciation of all the major factors that made his practice marked in its thoroughness.

Mr. Maltbie received his early education in Toledo and in Iowa and was graduated from the Ohio Wesleyan University. Upon his graduation he went to Baltimore, where he took a course in economics, mathematics and physics at Johns Hopkins University. Later he became professor of mathematics at Goucher College, Baltimore, and studied law. He was graduated from the University of Maryland Law School and was admitted to the bar. He remained at Goucher College until 1910. The following year he became president of the Merchants & Manufacturers Association. He was elected to the Maryland General Assembly in 1912 and while a member of that body was responsible for much constructive legislation. Mr. Maltbie was the first head of the Bureau of Municipal and State Research and following this served as a member of the City Charter Commission. During the war he was appointed assistant food administrator for the state and took full charge of this work when the administrator resigned.

Mr. Maltbie's intimate knowledge of law and mathematics and his untiring efforts to bring about improvement in every possible way were largely responsible for his appointment a few years ago as a member of Mayor Howard W. Jackson's Commission on Economy and Efficiency. He played an important part in the work of this body, which has brought about a real business administration in the city government. The work of this commission has attracted attention all over the country.

At the time of his death Mr. Maltbie was a director of the Baltimore Association of Commerce. He also had an important part in establishing the Sherwood Forest community, near Baltimore. Mr. Maltbie was born at Toledo, Ohio, in 1867.

Frederick M. Staunton

Frederick Marshall Staunton, president of the Charleston Interurban Railway, Charleston, W. Va., and one of the most prominent business men of that city and the Kanawha Valley, died on Jan. 20 at his home in Charleston. His activities in the traction line began with his reorganization of the original company into the Interurban company. It was during his administration that the Interurban company branched out and added the traction lines to Cabin Creek Junction and

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St. Albans, later acquiring the Dunbar line. He was also president of the Kanawha Banking & Trust Company and until about four years ago was president of the Diamond Ice & Coal Company. He organized these companies and developed their affairs. Mr. Staunton was 60 years old.

Frederick A. Huntress

Frederick A. Huntress, for many years an official of the Brazilian Traction, Light & Power Company, Ltd., operating in the cities of Rio Janeiro and São Paulo, Brazil, died at Boston on Jan. 27. He had been connected with electric railways in Boston, Montreal, Halifax, N. S., and Worcester before he was chosen in 1905 as the first manager of the Rio Janeiro property. Later he was made first vice-president and general manager of the company, becoming one of the best known North Americans in Brazil. He returned from South America in 1922, and had resided since in Lenox and Boston.

Mr. Huntress was a brother of F. E. Huntress, president of the Neal Electric Headlight Company, who died Dec. 19.

Frederick N. Parsons, superintendent of the department of electrical repairs for the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died on Jan. 11. Mr. Parsons had been connected with the Brooklyn railways almost continuously for the past twenty-eight years. He went with the old Nassau Railroad, a surface line, in 1898, served as foreman of the electrical department of the Brooklyn Rapid Transit Company from 1902 to 1907 and as superintendent of that department from that time until his death. His quiet, unassuming manner made many friends for him in the railway industry and his close attention to the details of electric railway equipment made his department the barometer of the system. Previous to his work in Brooklyn Mr. Parsons was connected with the Steel Motor Company and the Lorain Steel Company. He was 57 years old.

Judge Bernard F. Brough, who retired as Mayor of Toledo, Ohio, on Jan. 1, died on Jan. 14 after a brief illness. He served as Mayor four years. He took a keen interest in traction matters, so much so that he addressed one of the annual meetings of the American Electric Railway Association. Judge Brough was a close friend of Frank R. Coates, president of the Community Traction Company and president of the American Electric Railway Association. He was 54 years old.

Ernest Benedict, one of the oldest railway engineers in England, died on Dec. 1 at the age of 87. He was one of the last if not the last of the engineering pupils of Isambard Kingdom Brunel and was associated with the construction of the long-time famous steamship the *Great Eastern.* For many years he held important railway posts in India. On returning near the end of last century he became engaged in engineering journalism and for some years was secretary of the Tramways and Light Railways Association. For 53 years he was a member of the Institution of Civil Engineers.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Rubber Monopoly Hit

Two Large American Concerns Formed to Stimulate the Independent Production of Rubber

Air continues to leak out of the crude rubber balloon as American consumers maintain their policy of watchful waiting. Prices in England have been steadily falling since the peak of the boom was reached several weeks ago and some speculators in rubber stocks have become rather panicky, making frenzied efforts to unload their holdings on a sluggish market. Some observers have declared this to be a result of the political turmoil engendered in United States government circles over this commodity. Whether this is actually the case or not does not seem to be the principal consideration. The main fact is that prices of the British monopoly continue to fall, while concerted efforts are being made by American interests to cope with the rubber situation without federal treasury aid.

This point was made by Secretary Hoover in a report to the House interstate commerce committee on Jan. 18. No slackening in American ventures in this field has occurred as a result of the policy of the administration to advise against government loans to those interested in plans for breaking the back of the British monopoly.

Two very positive steps have been taken in this program. One of these is the formation of a $10,000,000 organization—the American Motor Rubber Company—whose function will be to stimulate independent production of rubber, and the other is the formulation of plans for a $50,000,000 organization to invest in rubber plantations, now being worked out by the Rubber Association of America. Details of these two proposals are not yet available. Co-operative buying by American consumers has also been mentioned as a valuable aid in meeting the situation.

Promotions in Timken Executive Personnel

Ernest Wooler has been appointed chief engineer of the Timken Roller Bearing Company, Canton, Ohio. This office will entail his taking full charge of all automotive, industrial, experimental and service engineering. For the past year he has held the position of automotive engineer. He is an Englishman by birth and has had experience in both American and European engineering and manufacturing practices. His qualifications for the responsible position which he now assumes are therefore unquestioned.

For the past twelve years Mr. Wooler has been an active member of the Society of Automotive Engineers and the Institution of Automobile Engineers, which is the recognized British society. He has held important positions with many automotive manufacturing companies, both in this country and abroad, and has designed and supervised the building of many motors and other types of automotive equipment.

Other changes in the executive personnel of the Timken company include the promotion of J. W. Spray to the position of manager of sales, automotive division; those of E. W. Austin and R. W. Ballentine to be assistant managers of sales, automotive division, and that of Peter C. Poss to be assistant advertising manager. Mr. Poss has been in the advertising department of the Timken company at Canton since joining that organization. He was formerly with the Penton Publishing Company, Cleveland.

Gas-Electrics May Be Purchased Soon

Rumor has it that the Missouri-Pacific may shortly purchase a large number of gas-electric rail cars for use on its short lines. W. H. Fetner, chief mechanical engineer of the Missouri-Pacific Lines, was one of the officials aboard the St. Louis-built gas-electric car which was recently delivered to the Seaboard Air Line after a trial run from St. Louis to Memphis. While he refused to divulge the purpose of his trip, it has been noised abroad that the Missouri-Pacific is investigating the various types of rail cars now on the market with a view to finding the one best adapted to its own requirements.

Convention Interprets Coast Tendencies in Bus Design

Pacific Coast problems in the design of buses were discussed on Bus Day at a convention of Mack salesmen and representatives in Seattle, Wash. The principal speakers were D. Lloyd Smith and George H. Scragg. As interpreted by these speakers and in the discussion a demand is felt in the Northwest for lighter weight buses, more powerful brakes, higher speed and better body construction. All steel bodies are growing in favor and operators desire larger seating capacity. The place of the 14 to 21-passenger stage is slowly being superseded by the 25 to 29-passenger parlor car.

These tendencies are the result of growing attention to safety and comfort, according to the opinions expressed. Blinding fogs, winding roads and quick changes from high altitudes to sea level encountered in bus operation in the Northwest are the primary causes of the new designs.

Extensive promotions of personnel will be effective on Feb. 1, it was announced. H. H. Harwood, manager of the Portland branch, will become as-

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sistant to J. A. Stoner, vice-president and general manager of the Pacific Coast organization. C. C. Eickelberger, Seattle branch manager, will be special representative and territorial supervisor of the Pacific Northwest.

St. Louis Builds Large Gas-Electric Cars

Two New Units Designed for Seaboard Air Line—Comparative Tests of Bearing Equipment to Be Made—Torsional Strains in Body Are Largely Eliminated

DELIVERY of the first of two gas-electric passenger rail cars ordered by the Seaboard Air Line Railroad has been made by the St. Louis Car Company. The second car is ready for delivery. A trial run was made by the first car from St. Louis to Indianapolis over the line of the Big Four Railroad on Jan. 14. The 267 miles were covered in six hours 48 minutes, which is considered to be an excellent record, in view of the fact that the average running time for Big Four passenger trains on the same run is six hours. No especial attempt was made to attain a high running speed.

The two cars were built by the St. Louis Car Company and the Electro-Motive Company. They are among the largest cars yet erected in this country, their length over bumpers being 71 ft. 3⅝ in. A passenger compartment with a capacity of 34 persons and a capacious baggage compartment are provided. From the standpoint of flexibility of service, the value of the cars is greatly enhanced by the fact that they are capable of hauling three standard passenger coaches as trailers.

In designing the engine room and operator's compartment every effort was made to keep space requirements to a minimum. All of the various operating units are inclosed, thus eliminating all danger from exposed moving machinery. In the usual course of operation the engineer need only think of his throttle, controller and the air brake. There is no need for mechanical adjustments on a run made under ordinary conditions.

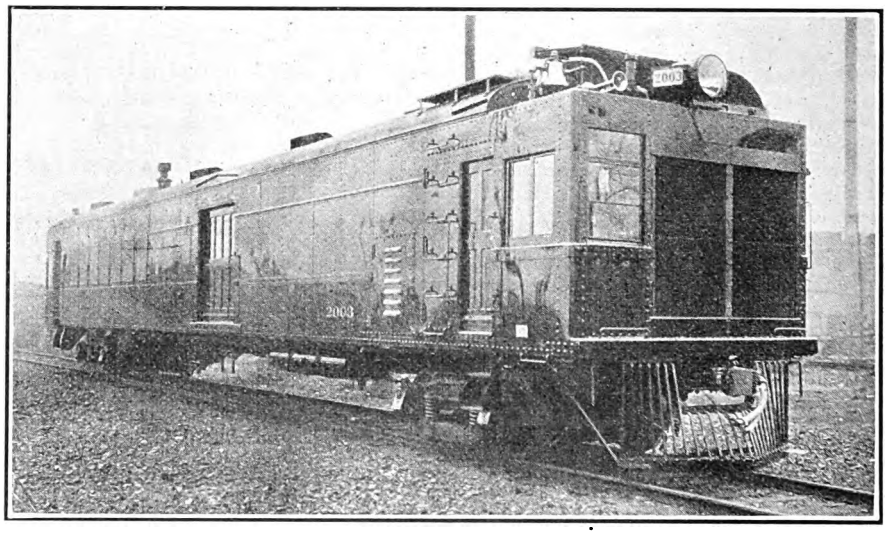
The prime mover of the power plant consists of two 200-hp., six-cylinder moderate speed gasoline engines, specially designed for railroad service by the Winton Engine Company of Cleveland, Ohio. Unlike other railroad gasoline engine equipment, it is not an adoption of a marine or automotive type of engine, but conforms to standard railroad practice in the use of standard United States threads and other construction features. Simplicity, rigidity and accessibility are outstanding characteristics of this design of engine.

All electrical equipment was designed and built by the General Electric Company. The generators are mounted on the same bases as the engines and are 700-volt direct-current machines especially, designed for these cars. They are excited separately. The voltage of the generators is regulated by the current demands of the motors and the engines are designed to operate at their most efficient speed regardless of the load applied. Twin motors are provided on both the front and rear trucks of the car.

The auxiliary equipment consists of an electrically driven air compressor, which furnishes air for standard Westinghouse combined straight and automatic air brake equipment and for starting the engine. Motor-driven fans cool the engine jacket water in honeycomb radiators. Current for the lighting system is furnished by storage batteries which are charged by the exciters of the generators. A 12-in. x 12-in. compressor cylinder and a type J slack adjuster are embodied with the Westinghouse air brake equipment. The signal system is Westinghouse type M, with standard couplings and hose.

Hyatt roller bearing equipment is provided on the car which has already been delivered. The other unit will be provided with standard A.R.A. journal boxes and brasses throughout. After the two cars have been in service for a certain period, in which the power consumption on each will have been accurately measured, the bearing equipment will be interchanged and the observations continued. In this way it is hoped to determined the operating characteristics of the two types on a competitive basis. The periods of observation will of course be equal.

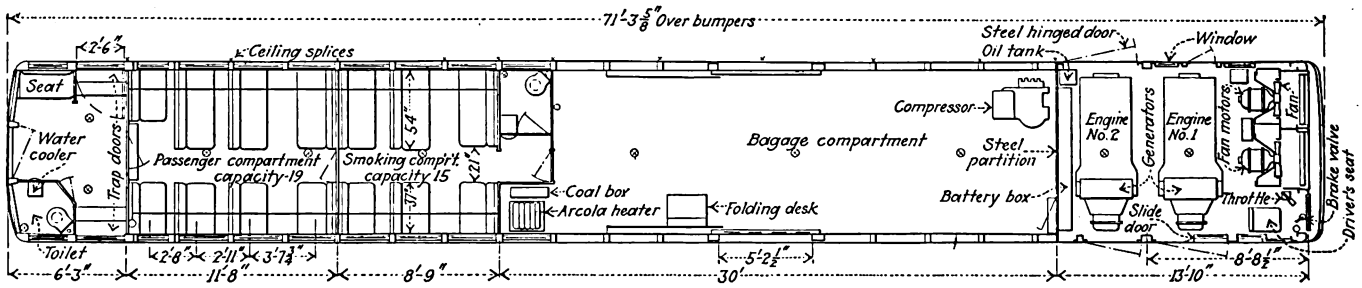
In designing the car the manufacturers gave especial thought to the elimination of torsional strains and the shocks usually caused by crossings, switches, curves and back tracks. Another decided advantage is the accessibility of all parts of the engine.



Completed Car Delivered to Seaboard Air Line

The steel partition between the engine room and the baggage compartment is bolted to special steel frames so that it may be easily removed when necessary. In addition, the whole side of the engine room may be removed if it is desired to remove the engine or other parts of the power plant for repairs or replacement.

All-steel construction is used in the car body, while the inside finish is of wood. Every effort is made to insure a maximum of strength while at the same time eliminating all unnecessary weight. Without load the weight of the car is 110,000 lb. The general design of this type of car is such that modifications in the superstructure may be made to meet specific requirements. The exterior finish of the car is olive green. A capacity run of about 450 miles without refueling is claimed for these units.



Floor Plan of Car. Note Compactness of Engine Room and Effective Arrangement of Passenger Compartments

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A list of the principal dimensions of the car is given here:

Length of car over bumpers	71 ft.	3⅝ in.
Width of car over all	9 ft.	10¾ in.
Height of car, rail to top of roof	12 ft.	6⅝ in.
Length of baggage compartment	30 ft.	
Length of passenger compartment (capacity 34)	11 ft.	8 in.
Length of engine room and operator's compartment	13 ft.	10 in.
Truck centers	50 ft.	10½ in.
Wheel centers	6 ft.	6 in.
Post centers and seat centers.		35 in.
Diameter of wheels		33 in.

Need for Quasi-Judicial Body Not Met by Trade Commission

Failure of the Federal Trade Commission to develop along judicial lines, as have other similar bodies of specialists, such as the Interstate Commerce Commission and the admiralty courts, is regarded as mainly responsible for the demand for its abolition. That there is a great need for a quasi-judicial body to deal with matters of unfair practice is admitted, but it will have to establish its principles out of precedent and experience.

The instinct of the people is against an institution in which the judges do the charging. The examiners and attorneys of the Interstate Commerce Commission, for instance, come before the commission in much the same way as the representatives of the Attorney-General go before the Supreme Court. They are in the same category as the representatives of the other party to the case and decisions frequently go against them.

There is evidence that the attempt of the Federal Trade Commission to fly in the face of the experience of a thousand years is unsuccessful, as its record shows that it has been wrong about 75 per cent of the time and has set up no fundamental principles which can be followed.

Vote on Pressed Steel Merger Feb. 17

Stockholders of the Pressed Steel Car Company will meet on Feb. 17 to act on the proposed merger into the company of the Western Steel Car & Foundry Company, one of its subsidiaries. Changes in the capital structure, through an exchange of stocks, is provided.

The agreement provides that upon the merger becoming effective, the corporate existence and name of the Pressed Steel Car Company shall continue with a total authorized capital consisting of $16,200,000 par value of preferred stock and $46,300,000 par value of common stock, of which there will be outstanding upon the completion of the merger $15,000,000 of preferred stock and $12,500,000 of common stock, against $12,500,000 of preferred stock and $12,500,000 of common stock now outstanding.

Mack Bus Shipments

Shipments of buses by Mack Trucks, Inc., during 1925 were 159 per cent larger than in 1924 and during the last six months of the year exceeded by 100 units shipments for the entire year 1924.

New Equipment Will Supply Traction Power in Philadelphia

One of the largest pieces of electrical machinery of its kind ever designed, representing an investment of close to $500,000, has been ordered by the Philadelphia Electric Company from the Westinghouse Electric & Manufacturing Company. The contract also calls for delivery of eight huge oil breakers having a voltage of 73,000 and a rupturing capacity of 1,500,000 kva. The machine, known as a frequency changer, upon completion next fall, will be installed in the Schuylkill River station of the Philadelphia Electric Company, which furnishes energy to both the Philadelphia Rapid Transit Company and the Pennsylvania Railroad. Another engineering feat of record-breaking proportion for the Richmond station of the Philadelphia Electric Company is the installation this month of six giant Westinghouse tap-changing transformers, each of 20,000 kva. capacity. Including the frequency changer, the total amount of the contracts awarded in this group aggregates nearly $750,000.

Problems of Roller Bearing Adaptation Are Interesting

Adapting roller bearings to the demands of modern car practice gives rise to many interesting problems. Each type of car has certain factors of weight, operating conditions, rated speed, etc., which require peculiar modifications. How these conditions are being met by SKF Industries is explained very clearly in a little booklet entitled "The Spherical Roller Bearing and Railway Journal Boxes." Four representative types of cars are considered, the single-truck safety car, the storage battery car, gasoline and Diesel electric cars.

Heavy duty spherical roller bearings have proved their worth on these and many other types of units. An important fact to consider in the modernization of used rolling stock is the facility with which existing plain bearing equipment can be changed over to roller bearings. That it is desirable to make this change is shown from the records of 500,000 car-miles operation in high-speed passenger service which spherical roller bearings have established.

American Brown Boveri Acquires Two New Companies

American Brown Boveri Electric Corporation has recently acquired two additional properties, namely, the Railway & Industrial Engineering Company, Greensburg, Pa., and the Electric Development & Machine Company, Holmesburg, Pa., near Philadelphia. These latest acquisitions will considerably amplify the present line of American Brown Boveri electric products. In addition to these properties, the corporation has in operation its plants at Camden, as well as those of the Condit Electric Manufacturing Company, Boston; the Scintilla Magneto Company, Sidney, N. Y., and the Maloney Electric Company, St. Louis. The newly acquired companies specialize in high-tension switching and protective equipment for power companies.

Brill Merger Is Culminated—Election of Officers Soon

Plans for the formation of the new Brill Corporation, which controls the J. G. Brill Company and the American Car & Foundry Motors Company, have been declared operative. A meeting of stockholders for the election of officers is expected shortly and at the same time announcement will be made of final details concerning the operation of the merger. It is expected that this organization of the new Brill Corporation will play an important rôle in the fortunes of the American Car & Foundry Company, which controls a majority interest in the new company. Strong hopes are held that the earnings of the Brill Corporation will be more than sufficient to yield Car & Foundry on its controlling shares returns in excess of the preferred dividends on the parent company's $30,000,000 of preferred stock, requiring $2,100,000 a year.

While the Brill Corporation will undoubtedly contribute very materially to the financial well-being of Car & Foundry, it should itself shine somewhat in the reflected prestige of its controlling mentor. In other words, both parties to the agreement should profit materially. If the results hoped for from the Brill Corporation are attained, they will add largely to the balance available for Car & Foundry common stock, leaving all earnings from the car business for that issue. Complete information concerning the various ramifications of the merger is given in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 16.

Metal, Coal and Material Prices

Metals—New York	Jan. 26, 1926
Copper, electrolytic, cents per lb	14.00
Copper, wire base, cents per lb	16.00
Lead, cents per lb	9.25
Zinc, cents per lb	8.35
Tin, Straits, cents per lb	61.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.875
Somerset mine run, Boston, net tons	2.175
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N.Y., cents per lb.	17.75
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.20
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.01

Track and Line

Memphis Street Railway, Memphis, Tenn., has announced that it will spend about $213,000 on tracks.

Los Angeles Railway, Los Angeles, Cal., is now at work on the second section of a track improvement job extending from 63d Street to Manchester Avenue on Vermont. The track is laid in private right-of-way in this section and is being lowered to con-

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form to the adjacent street grade. Cement curbs and landings are being built and the entire surface will be graveled and oiled. The first section, extending from 63d Street to Florence Avenue, cost $20,000, and the second section, from Florence to Manchester Avenue, will cost $50,200.

New York, N. Y.—The Board of Transportation will be ready to let contracts aggregating between $100,000,000 and $150,000,000 for new subway construction this year. The board during the last year recommended contracts totaling about $90,000,000, which have been approved by the Board of Estimate. Approval has been given to a contract with George H. Flinn, the lowest of seven bidders, for the construction of a section of subway in Eighth Avenue between Eighteenth and 28th Streets and an appropriation of $5,258,000 for the work.

Boston Elevated Railway, Boston, Mass., will improve its trackage in accordance with an order issued by the Massachusetts Public Utilities Commission, which in a single day gave certificates of approval of repairs, relocations and extensions in Boston, Belmont, Brookline, Cambridge, Chelsea, Everett, Medford and Somerville. In Boston the projects are:

Tremont Street, crossover 133 ft. long; Broadway, crossover 133 ft. long; Charles Street, 2,254 ft. of track; Dorchester Avenue, crossover 133 ft. long; Dover Street, 204 ft. of track and 1,171 ft. of track; Blue Hill Avenue, Roxbury, 367 ft. of track, including two crossovers; Blue Hill Avenue, at Franklin Park, Dorchester, 898 ft. of track, including crossover; East Eighth Street, from H Street to K Street, outbound track, 1,020 ft. in length; Charles Street, from Cambridge Street to Eruit Street, 599 ft. of track; Lotus place terminal, Forest Hills, special work; Dorchester and East Eighth Streets, South Boston, curved track, 725 ft. in length; Eliot Square, Roxbury, 873 ft. of track; Washington Street, crossover 133 ft. long; Park Street, Dorchester, 4,071 ft. of track; Harrison Avenue and Beach Street, 112 ft. of track; Neponset terminal, Neponset, 2,331 ft. of track; Talbot Avenue, 9,061 ft. of track, including 133 ft. of special work; Dorchester Avenue, South Boston, crossover 133 ft. long; Chelsea Street, Charlestown, 1,351 ft. of track; Neponset Avenue, Dorchester, 3,777 ft. of track; Beacon Street bridge over Boston & Albany Railroad, 1,107 ft. of track.

Belmont—Belmont Street, 2,458 ft. of track; Leonard Street, 1,004 ft. of track; Trapelo road, 3,311 ft. of track, including crossover 133 ft. long.

Brookline—Boylston Street, at Lee Street, crossover installed, 362 ft. of track.

Cambridge—Western Avenue, at Blackstone Street, crossover 133 ft. long; Cambridge bridge, at First Street, 602 ft. of track, including two crossovers; Somerville Avenue, 398 ft. of track.

Chelsea—Central Avenue, 2,253 ft. of track.

Everett—Ferry Street, 2,677 ft. of track, including crossover; Elm Street, 4152 ft. of track; Broadway and Chemical Lane, 502 ft. of track; Broadway, at Thorndike Street, 141 ft. of track in branch-off to power station.

Medford—Main Street, north of Buzzell's lane, crossover 133 ft. long; Boston Avenue, inbound track, 5,241 ft.; Curved track at Salem Street and Fellsway, 253 ft.

Somerville—Summer Street, 261 ft. of track; Cross Street, 1,889 ft. of track; Somerville Avenue, 2,877 ft. of track; Boston Avenue, 1,300 ft. of track.

Boston and Cambridge—Harvard bridge, 4,103 ft. of track, in connection with reconstruction of bridge.

Somerville and Boston—Washington Street, Somerville, and Cambridge Street, Charlestown, from near Tufts Street to 233 ft. east of Somerville line, 4,057 ft. of track.

Somerville and Medford—College Avenue, 4,063 ft. of track.

Philadelphia, Pa.—Payments aggregating $2,723,952 have been made by the City Treasurer on warrants issued by Director Ehlers of the Department of Transit on account of work on the construction of the various units of the subway on Broad Street. The amount paid to each contractor follows: Keystone State Construction Company, contractor for the section between Filbert and Stiles Streets, 1,335,804. Patrick McGovern, Inc., section between Clearfield and Courtland Streets, $372,441. Patrick McGovern, Inc., section between Courtland and Chew Streets, $540,347. Patrick McGovern, Inc., section between Chew and Grange Streets, $475,359.

Power Houses, Shops and Buildings

Nashville Railway & Light Company, Nashville, Tenn., has completed its $35,000 railway substation at Colorado Avenue and 41st Street.

Pacific Electric Railway, Los Angeles, Cal., is erecting a new station in Alhambra at West Main Street and Raymond Avenue to cost approximately $4,500. The new structure will house the ticket, freight and express offices and will contain waiting rooms.

$500,000 Terminal Opened in Montreal.—Montreal's new $500,000 street railway passenger terminal station has been opened for public service by the Montreal Tramways. The new terminal is situated on Craig Street West, corner of Cote Street, opposite the Street Railway Building, and next to the Power Building.

Williamsport Railways, Williamsport, Pa., plans to construct a carhouse on West Third Street. The present carhouse on West Fourth Street will be abandoned.

Trade Notes

Fageol Company, Canton, Ohio, delivered to the Miami Beach Railway, Miami, Fla., ten gas-electric buses, type ADS-GE, during the period extending from Jan. 1 to Jan. 15. These buses were equipped with Westinghouse air brakes and the electrical equipment was supplied by the General Electric Company.

Charles J. Brickley has become connected with the Electric Service Supplies Company, Chicago. He has been connected with the Benson Electric Company, Central Electric Company and for a time operated an electrical construction company of his own. Recently Mr. Brickley has been with the Electric Steel & Sales Company, Milwaukee. He will cover Wisconsin and upper Michigan.

William K. Vanderpoel has been made vice-president and executive engineer of the Okonite Company and the Okonite-Callender Company, Inc., manufacturers of wire and cables for electric purposes, with factories at Paterson and Passaic and general offices in New York City. Prior to assuming his new duties, Mr. Vanderpoel was general superintendent of distribution of what is now the electric department of the Public Service Electric & Gas Company, Newark, N. J. He affiliated himself with Public Service in 1907 as superintendent of distribution for the Essex district. He has also had considerable mining experience.

Graham Brothers, now a unit of Dodge Brothers, Inc., Detroit, Mich., is greatly increasing its output of buses. One of its new models which is gaining considerable popularity is a street car bus type, with a capacity for twenty passengers. It embodies many features suggested by experts at the American Electric Railway Association convention held last fall in Atlantic City. This company is also showing a new 32-passenger bus and a 60-passenger double-deck bus which will be in production within three months.

The Eisemann Magneto Corporation, New York, has announced important changes in its field staff. Irving W. Edwards, for the past year Pacific Coast representative, is transferred to Detroit, succeeding E. H. Hohenthal, resigned, as district manager. O. L. Bachman, who has acted as traveling service representative in the Detroit territory since 1919, becomes district manager on the Pacific Coast with headquarters at San Francisco. R. E. Dinnsen has been appointed assistant manager of the Chicago branch, succeeding C. M. Montz, resigned.

Mack Motor Truck Company, New York, announces through its office in Boston, Mass., that electric traction interests there purchased ten Mack buses during the last half of December. The Boston Elevated Railway bought five 29-passenger city type buses for operation between Union Square, Allston and Cambridge, a distance of 4 miles, for which a fare of 6 cents, 10 cents with transfer, will be charged. The schedule calls for 30 trips a day. Balloon tire equipment is used on these buses. Stone & Webster purchased for the Virginia Railway & Power Company five 230-in. bus chassis. The American Car Company will build the bodies and the buses will be put in service in Richmond, Va. The Boston & Worcester Street Railway purchased through F. T. Miller two 29-passenger Macks for operation between Saxonville and Framingham, a 4-mile route at a 10-cent fare.

Advertising Literature

Graybar Electric Company, New York, successor to the supply department of the Western Electric Company, has issued its annual electrical supply year book for 1926-27. More than 60,000 items are listed. All are shipped under the Graybar tag guaranteeing quality and service. There is a handy index at the back of the book, together with other useful features. Copies may be obtained from the Graybar company.

Linde Air Products, New York, N. Y., announce the combination of their two monthly publications into one magazine to cover a field formerly divided between the two. The new publication is known as the "Oxy-Acetylene Tip for the Linde Oxwelder" and starts with the acquired prestige of each of its predecessors. Articles of value to all interested in welding, from the seasoned executive to the studious welder, will be carried every month.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Optimism Characterizes C.E.R.A. Midwinter Meeting

NEVER has an annual meeting of the Central Electric Railway Association carried a message more clear than did the one held at Indianapolis on Jan. 28 and 29. In the addresses made by President Coates, Mr. Storrs and Mr. Budd the keynote of optimism was dominant. This was not based on hopes alone, but on facts and figures established by the industry during the past five years. In particular Mr. Budd cited examples of a dozen or more roads which have shown a material increase in operating income over a five-year period.

Progress has been made along many different lines. Physically the roads are being placed in better condition. New cars are replacing old, new track has been laid and adequate facilities have been installed. The use of one-man cars has become well-nigh universal, with not only a saving in car-mile operating expense, but an actual improvement in service. The bus has been changed from a competitor to a useful tool of the railway systems in such a way as to extend and complement the rail service.

A wholly new viewpoint has been taken by operators and holding companies as regards publicity. Once shunned, it now has become not only the usual thing, but managements are vying with one another to see which can devise the best methods and reach the largest number of patrons.

The effect has been widespread. Companies that have progressed along these lines have found it easier to get riders, easier to keep taxes and obligations within bounds and easier to finance. Perusal of the addresses and papers of the C.E.R.A. meeting will show other roads many of the methods actually adopted to make these things possible.

Change in Engineering Procedure Should Facilitate Standardization

FAR-REACHING changes are to be anticipated by the revision of methods for voting on standards proposed by the American Electric Railway Engineering Association and approved by the American Association executive committee at its Indianapolis meeting. For years the work of standardizing dimensions of parts, materials and practices has been carried on by the Engineering Association. This has been conducted through the medium of investigation and report by committees, followed by action of the committee on standards. After this the procedure has been to present the proposals for standards before the annual convention, a vote taken by the delegates present giving acceptance or rejection. The point has been made that this procedure not only consumes the greater part of the time of the convention sessions, but does not assure a representative vote. In fact, it is not possible to determine whether a majority of the accredited delegates present actually votes for or against the proposed standard, as a poll is rarely required.

In order to remedy this situation it is proposed to pass on standards by letter ballot of member companies. The committee reports are all printed and distributed to the membership. Each delegate should be thoroughly familiar with the subject matter, and able to vote intelligently on the proposition submitted. The result should be a higher level for the association's standards.

It was pointed out at the executive committee meeting that with the change in method of adopting standards in effect, their use by member companies and by the industry in general should be urged more than at present. There has been a disregard of standards by some prominent companies that at times has raised a serious doubt as to the advisability of continuing the work. Certainly it is a waste of time and money to ask responsible engineers to prepare standards that are not adopted generally.

Use of the letter ballot should do much to correct this situation, as an affirmative vote carries at least an implied obligation to adopt the standard. While there may be some slight inconvenience if the company standard has to be changed, this is not likely to continue for any length of time, and the benefits of having a standard for the entire industry are obvious.

Foreman Conference Demonstration Something New in Convention Proceedings

DEMONSTRATION of an actual foreman training conference was a novelty in the program of the annual convention of the Central Electric Railway Association, held in Indianapolis last week. This brought out clearly the principles and application of one method of conducting such conferences in a way that will be long remembered by the audience, which followed every word of the foremen with keen interest. It was also convincing, because the participants were experienced foremen who showed by the way in which they took part in the discussion that they believed in what they were doing. This exhibit was staged by the committee on education of the American Electric Railway Association, with the co-operation of the Indianapolis Street Railway, the Terre Haute, Indianapolis & Eastern Traction Company and the Boston Elevated Railway. H. H. Norris of the latter company conducted the program in such a way as to emphasize the various points brought out in regular conferences of his foremen. The demonstration conference was an abbreviated session of conferences such as the Boston Elevated has been holding for the past few months.

Aside from the obvious merit of this plan for

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dramatizing the recommendation of the committee on education, the "stunt" taught several important lessons. One is that the experience of foremen can be depended upon for intensely interesting and useful material for discussion. Another is that fundamental principles of foremanship can readily be proved by deduction from this material. When such analysis is based upon concrete incidents, these principles, if drawn logically from the facts presented, must be sound and must be appealing to the common sense of every thoughtful foreman.

Foreman training, by some such plan as the one illustrated, is a phase of educational work which the committee on education desires especially to stress this year. The C.E.R.A. demonstration, which followed a similar recent one by a Boston Elevated group before the New England Street Railway Club, will render more tangible the printed suggestions which the committee will distribute. The committee on management and operation, which also met in Indianapolis last week and many of whose members witnessed the demonstration, will reinforce the recommendations of the committee on education, as its regional committees carry on the work of visitation. The result cannot but be beneficial to all properties whose foremen will join in this effort to make themselves better leaders.

Where It Does Not Provide for Transportation, City Planning Must Give Way

CONSTRUCTION of a railway, whose convenience and necessity to the public have been proved, must not be held up because its construction may interfere with the interests of a few property owners. This decision was recently rendered in Wisconsin, where the question came up legally in connection with some extensions proposed by the Milwaukee Electric Railway & Light Company. There was no doubt that these extensions were justified on the grounds of the convenience and necessity of the public, but the grant was opposed by the authorities of Milwaukee County because certain parts of the route were said not entirely to fit in with the city plan adopted for one of the outlying suburbs. In consequence, an order was secured by the county from the Circuit Court requiring the commission to reconsider its permission for the proposed extensions and to hold such further proceedings as might be necessary, so that the effect on the zoning and city plan of the suburb mentioned would receive full consideration.

Fortunately, the Supreme Court of Wisconsin, before which the case came on appeal, has held that the inconvenience of individuals along the proposed right-of-way cannot affect the general subject of the need of transportation facilities by the general public. Hence, any evidence as to zoning, city planning and other similar matters of towns along the route is immaterial where the convenience and necessity of transportation are involved. Any injuries caused to the individual owners of real estate by the construction of the line, the Wisconsin Supreme Court said, can be offered in evidence for adequate compensation during the condemnation proceedings.

After all, a community cannot have the advantages of modern improvements, among which are included transportation, without their few minor disadvantages. The effect of introducing rapid transit facilities in a community is usually vastly to increase the value of by far the greater part of the real estate. If individual owners suffer, they have their remedy in court and should not be permitted to stand in the way of blocking the benefits which will come to the majority from the construction of the line.

Idea of Celebration at Christmas Spreads Among Railways

PERHAPS there is no field of endeavor in which the electric railway has made more striking strides for betterment than in its human relations activities. Hitherto, these activities have been more or less confined to general welfare work in hospital cases, in awarding sick benefits and insurance policies as well as in establishing summer recreation camps and schools for the spiritual and intellectual stimulation of its employees.

More recently, however, as reflected in the news pages of the JOURNAL that department has become more expansive. It has founded an institution known as the Christmas Celebration, which in definite though different form is becoming part of the life of every man under railway management. This so-called Christmas spirit has been a long time finding its abode in the center of railway activity, and so worthy is the intention and so contagious the enthusiasm that ere long there will probably be no work left for the ghost of Marley to perform on Christmas Day. During the last holiday season innumerable companies entertained their employees around brilliantly decorated Christmas trees, gave presents to employees and expressed tangibly their well wishes even to employees' wives and kiddies. In some instances, the officers and employees celebrated the season by working with willing hands and anxious hearts toward making a Merry Christmas for the needy.

This taking on the Christmas spirit is one phase of the public relations work in which the personal material gains are negligible when compared with the inevitable spiritual gratification. The natural but too prevalent inward query "what shall I get out of it?" is either summarily dismissed from the mind or gradually, as the spirit takes hold of the employee, is merged into a more selfless trend of thought—"how much more of myself can I put into this scheme?" As the attitude of the company is almost sure to be reflected even in the lowliest employee and the spirit of the message transmitted by him in his dealings with the patrons, there is no telling how far reaching the benefits of the Christmas party idea will be.

Careful Analysis Will Prevent Errors of Uneconomic Bus Substitution

WHETHER or not to substitute bus service for electric railway service is sometimes a difficult question to answer. How it is done by the United Traction Company of Albany was told in a paper by E. A. Murphy presented at the midwinter meeting of the New York Electric Railway Association. Mr. Murphy gave a most astonishing indorsement of the bus in city service, saying that the popularity of buses over trolley cars is quite evident. Besides being more pleasing, Mr. Murphy stated that the transportation is quicker, safer and subject to fewer delays from traffic obstruction.

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Before undertaking such a substitution earnings and reconstruction costs of a railway line are carefully surveyed. Great attention is given to consideration of the traffic that must be handled. If the substitution is made, will the smaller capacity buses successfully replace the larger capacity cars? It would be folly to make the substitution on the basis of reconstruction costs of track alone and then find in time that the traffic was too heavy to be economically handled by buses.

One method of reducing reconstruction costs of tracks that has been under consideration for many years, but has not made as much progress as could be desired, is obtaining relief from paving obligations. If this burden could be eliminated, it might change the situation in many cases of prospective changeover to buses by throwing the balance in favor of car operation.

In another paper presented at the same meeting, by William P. Capes, the suggestion was made that the New York State law relative to paving obligations be removed and the authority to determine the amount of such taxation placed on the political subdivision having immediate jurisdiction over the territory through which the individual railways pass. An upper limit of such taxation, however, would be the amounts now existing. This is a move in the right direction and indicates the tendency of the times.

That relief from such unjust taxation as that emanating from the horse-car days is bound to come is as sure as the industry itself. There were many serious errors made in early days of street car operation. Other errors of faulty substitution of buses must be guarded against just as certainly as errors arising from the failure to make bus substitution where an economic study indicates such a substitution desirable. Paving costs are so great a factor in studies of this kind that it is necessary to consider the situation from the standpoint of having obtained relief or else there may be much capital lost that might otherwise be saved.

C.E.R.A. Standard Freight Car a Service to the Industry

FOLLOWING years of talk concerning the elusive attribute of co-operation, certain members of the Central Electric Railway Association have at last proceeded to demonstrate that "a bird in the hand is worth two in the bush." In other words, they have gathered together in friendly conclave and, through the medium of their Master Mechanics' Association, formulated plans for a standardized freight car to be used in interurban service. Details of the new equipment and the plan under which it is being purchased by the several railways are published elsewhere in this issue.

Certainly such an outstanding accomplishment by any group of companies is well worthy of commendation. Advantages accruing from the use of standardized equipment are manifold. Reductions in initial outlay are not the least of these, since the manufacturers are able to produce the equipment at much less cost. Then, too, there are economies to be effected, particularly on lines that adjoin, by operating the cars jointly for through freight service. Both of these points are of considerable note. But the finest feature of the entire development is the admirable spirit of mutual accord which has marked the negotiations between the various participating parties. Every road has shown itself willing to meet the others more than half way in a consideration of joint requirements. Needless to say, the industry has not been overly blessed with this spirit in the past, and it is the more welcome when it finally appears in so auspicious a fashion.

No little credit is due to T. A. Kenny, of Hodenpyl, Hardy & Company, whose efforts played a leading rôle in bringing the whole plan to fruition and in arranging the method of financing the purchase of cars. His assistance has been warmly appreciated by the interested companies.

Because of the widespread influence which this development undoubtedly will exercise, its value may extend throughout the entire industry. The work of standardization may well be carried further. Of course it would not be advisable for every company to standardize with every other road so far as the external design of passenger equipment is concerned. Individuality here is productive of appreciable returns and is a real asset to be cultivated. But in many items of passenger, as well as freight, equipment standardization can be carried out with excellent results.

Necessity for Co-ordination Shown by Indiana Bus Failure

COLLAPSE of the grandiose scheme of Ward B. Hiner to control intercity transportation in Indiana was referred to by Managing Director Storrs in his Indianapolis address as a demonstration for the need of greater care in analyzing the possibilities of competitive operation.

In this case the promoter, who controlled the Indiana Red Ball Lines, Inc., attempted to conduct an intercity bus system on a huge scale, not only in direct competition with interurban railways but with independent bus operators who would not meet his terms. The opportunity presented itself on account of lack of any regulation of bus operation on highways in the State of Indiana, a condition which since has been corrected. This operator failed to recognize the fundamental economic principle that business cannot be conducted indefinitely at a loss. His idea of the function of the bus was a mistaken one. Rate of fare seemed to be the sole appeal offered by his service. Mr. Hiner's vision seems to have been limited to seeing the existing passengers on the interurban cars as prospective riders for his buses.

Co-ordination on a single route may be effected in two ways: First, alternation of schedules of cars and buses, in which service and rate of fare are quite similar, but in which unnecessary duplication is avoided. This amounts virtually to a shortening of headways. Second, the bus may be used to give an entirely distinctive service at a distinctive rate of fare. This may contemplate the use of buses to give a de luxe express service, while normal service is given on the cars; or local transportation may be given by buses, while the cars are utilized for the high-grade service.

That there is a demand for bus service in this territory is indicated by the experience of the interurban roads, which themselves are operating vehicles on the highways. With the enormous growth in riding created by the automobile Mr. Hiner's attempt to win the interurban passengers by cutting fares rather than to obtain riders from automobile owners by rendering a service that would be attractive to them was the primary cause of his failure.

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Mr. Storrs' Daily Dozen for Electric Railways

1 *Exercise Our Eyesight.* Look around and see what the conditions really are. Accept the situation and whether there is hope for increased business in our respective territories or no hope, let us see it clearly and know the truth.

2 *Exercise Our Imagination.* Let us view the future hopefully and ascertain what it holds for us. The days of trailing in the local transportation business are gone. We must lead, we must have vision, we must keep a jump or two ahead of our communities if we are going to prosper.

3 *Exercise Our Faith.* We must have faith in our employees and cause a like faith in them for us. Managements and men must work together. If mutual faith does not exist, personnel should be changed to bring it about. It is unfair to ourselves, unfair to our employees and unfair to the public to have inharmonious relations existing on our properties.

4 *Exercise a Fidelity to Our Traveling Public.* This industry cannot prosper if we lack the confidence of our customers. If any among us doubt this, let us first look honestly within and see if we cannot discern some reason for their lack of faith in us. If we are then convinced that the fault is not our own, let us go frankly to the car riders and tell them where and how we think they are wrong. They usually will be fair.

5 *Exercise Our Hearing.* Do we know as much as we should what the people are saying about our service? Pleased riders are our greatest assets. Let us find out what they want by listening to what they have to say and then give them what they need and should have as nearly as we can.

6 *Exercise Our Gift of Speech.* We are behind other industries in telling our story. Fortunately we are improving in this respect, but we should talk more. Let us, when opportunity offers, tell to individuals, to groups of half dozens, or to crowds of thousands, our point of view. One spoken word is worth a hundred printed ones.

7 *Exercise Our Legs.* Legs as a means of locomotion are going too much out of style the world over in recent years. In our business we use our own too little. Entirely too many electric railway officials depend on their motor cars and permit their employees to do likewise. We cannot inspire others to use our services if we don't use street cars ourselves. A rule that none in our employ, including executives, shall use automobiles for business purposes, save in exceptional or necessary cases, might not be a bad one.

8 *Backbone Exercise.* It is needless to tell the benefits of a firm, strong and stiff backbone. It means courage, grit, poise, balance, and all these cannot help but result in an alert vigilance.

9 *The Open Mind Exercise.* Let us not say that a thing cannot be done unless we are sure. Even if we are reasonably sure that it cannot be done let us think it over carefully before giving our decision. Sometimes we may find that the seemingly impossible request can be granted or compromised if given fuller and more thorough consideration. If it proves impossible a careful study of the request ought and usually will convince its maker that we have granted him every consideration. We do not want a reputation as a consistent "no" industry. A good way to avoid such a reputation is to render decisions affecting public relations only after slow and very careful deliberation.

10 *Exercise Cheerfulness.* For many years I fear our industry had a reputation for lack of consideration of public welfare. In recent years this attitude has changed. People come to us with the feeling that they will receive a cordial and friendly reception. Nothing will do more to foster it than a cheerful attitude in our relations to the public.

11 *A Bending Exercise.* Probably few single exercises are better for our own health and the health of the industry than this one. Especially if we bend over sufficiently to understand the other man's viewpoint. It is a splendid thing for the circulation. It will make us all feel better and add to our business, and if it limbers us to the extent of losing some old worthless ideas and acquiring some new ones the benefit is assured.

12 *Exercise of Our Chests.* The twelfth and last exercise I have to recommend is perhaps as important as any. It is that of expanding our chest privately and publicly. A great deal has been said about encouraging our employees to recognize the romance and possibilities of the electric railway business. We cannot expect them to romance about our business, however, unless we feel and show pride in it ourselves. Too many street railway men have for too long adopted a limp attitude and have hesitated to boast about what their industry means locally and nationally. I firmly believe that if we had indulged in more industrial chest expansion in past years we would be in a better situation than we are today. Ours is an essential industry. Without it communities could but poorly exist. We have splendid reasons for throwing out our chests and showing that we have pride, faith and hope in our great industry. Let us do it.

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A Daily Dozen for Electric Railways*

Results of Constructive Work of the Leaders of the Industry Are Beginning to Be Felt—Bus Problem, Taxation and Financing Are Improving—A Series of "Exercises" for Electric Railways Is Proposed

By Lucius S. Storrs
Managing Director American Electric Railway Association

DURING this past year much constructive effort which is beginning to show results has been put forward by leaders of the industry, and particularly by members of the Advisory Council. My endeavor will be to present briefly a picture of the high points of the present conditions and possibly indicate the trend of affairs in local transportation throughout the United States.

This morning a most encouraging address by Mr. Budd must have proved to you without any question that there is a very marked and general financial improvement throughout the country. Mr. Budd's address should be read by everyone engaged in our industry; it is not only a message of optimism, but indicates so clearly the essential soundness of our industry and the underlying factors that are necessary to the success of any electric railway property, from one who is best qualified to speak with knowledge and understanding.

Summarized, conditions within our industry which are dependent in part on the influence of outsiders, such as city, state and national regulatory bodies, car riders, bankers and others, are improving steadily. By such conditions are meant rates of fare, jitney and bus regulation, paving relief, financing and collateral matters. Improvement has not been so marked in conditions over which the industry itself should have major control. By that I mean principally the increase of freight and passenger traffic. I am thoroughly convinced that as a whole we are depending too much on the natural trend of the business to bring an increase in traffic. We could do more than we have.

This is, of course, only a generalization. It is utterly impossible for anyone to summarize the national and local transportation business in a way that will fit every local condition equally. We can only say that business is better or worse than it was during a preceding year, speaking in general terms. For instance, during the last five months, passenger traffic in every geographical section of the United States, except New England, has increased. The upward move started in July and has continued uninterruptedly since. The high point was reached in November, with 3 per cent more passengers than were carried in November of the preceding year.

The point I wish to emphasize, however, is that merely because business is better in a general way throughout the industry, it does not necessarily follow that business is better on every line. There are small and unfortunate properties on which business is not increasing. Probably there are some on which it never will increase. There is a point which we should not forget in any of our considerations; that is, the initial requisite to the success of an electric railway is sufficient population to warrant the giving of electric railway service. We have heard a great deal in recent years about abandonment of electric railway properties. These abandonments have been expressed in miles, number of cars and in other ways by persons whose selfish interests were best served by giving publicity to such abandonments. But the fact that most of them were in communities where electric rail lines should never have been laid has been ignored. Most of them have been in sparsely settled communities. Of course, the best managements in the world could not have made such lines pay. There still are other lines in the same situation in this country. If there are not enough riders or enough trade to indicate profitable operation, it is futile for any management to make the effort. Just how many potential riders or tons of freight should be in sight in each case it is impossible for one to say, but any keen operator can tell in a general way what the prospects in each individual case must be. I am strongly in favor of modernization, progressive management and intensive effort, but all of them are useless unless the property to be operated is in a territory that gives reasonable promise of support.

THE BUS PROBLEM APPROACHES SOLUTION

Solution of the bus problem is slowly but surely coming about. You of the Middle West realize this possibility better than anyone else, because here you have had so many striking examples of the truth about bus operation. It has been demonstrated beyond all doubt, here in Indiana particularly, that bus rides cannot be furnished as cheaply as rides on electric rails and also that buses, which have a definite place in co-ordinated service, have been used as tools of promoters whose chief interest was the sale of securities and not the improvement of local transportation.

You are all familiar with the details of the failure of the Indiana independent bus operation, but it is such a clear example of what is going on in a similar way in a few other parts of the country that it may be worth a passing reference. Attempts were made within the last year to create in Indiana one of the greatest single independent bus operations in the United States. A huge bus terminal was built here in Indianapolis by subscription chiefly from merchants near that location and 75 or more buses operated into this terminal from about 100 Indiana communities. The promoter of the enterprise declared vehemently that buses could be operated at either 1 or 1½ cents per mile over the Indiana highways and made to return a 20 per cent profit to the operating companies. The inference left by this statement, of course, was that interurban railways charging 3 cents per mile and steam railways 3.6 cents per mile were robbing the public. The terminal was opened last May and on Dec. 21, some seven months later, the company went into the hands of receivers.

*Abstract of an address before the Central Electric Railway Association, Indianapolis, Ind., Jan. 28-29, 1926.

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Coincidentally, Fred I. Jones, receiver for two of the companies, declared that "operation has been on a losing basis since its inception." One of his first steps after taking charge of the companies was to suspend 31 of the lines and to apply for a rate similar to that charged by the steam and electric lines.

Fortunately the promoter did not spread his stock very widely among citizens of Indiana. The losses, in the main, it is understood, were absorbed by a high corporation which backed him.

It is probable that out of this independent bus line experiment will come much good. It will be helpful in warning the public against buying stock in wildcat bus propositions. It will be a lesson to manufacturers who are willing to finance unwarranted competitive transportation systems, and it will protect electric railway properties which are rendering good service against unfair competition.

Credit Situation Improving

Full or even partial rehabilitation of our industry will not have been accomplished until its credit has been restored. In this respect there is a marked improvement. Bankers are no longer refusing to lend money to electric railways. Their attitude generally is that they are willing to help finance companies operating in territory that seems to promise business development, progressive management with modern ideas and up-to-date methods and equipment, and public relations views of 1926 models. Any company measuring up to these requirements may approach financial houses with every measure of assurance that their applications will receive respectful consideration.

Modernization of equipment has received much discussion recently at the hands of our leaders, manufacturers, industrial publications and others. An erroneous impression that the association was advocating the junking of one-half of all cars in service has arisen. This should be corrected. It is true that modern equipment is necessary to the development of new business, but it is not true that a line to be modernized must junk all its equipment of a certain age. New cars are preferable to old, of course, and it is hoped that the manufacturers will be able to produce such satisfactory designs that there will be an added impetus to equipment purchases. This does not mean that all cars which have been in service a certain number of years must be discarded. All that the industry can hope to accomplish is to bring equipment up to a higher standard and to reassign all rolling stock to the proper service.

The reason which impelled our original suggestion for careful consideration of this matter was the hope that a different and more aggressive presentation of the advantages of the newer types of rolling stock would be made by the car building branch of the industry. There is no question but that results are being accomplished along this line. The work of the manufacturers' committee is really having the effect that was desired, and the future development of the idea can well be left to its efforts. And right here let me say that I want to express to the manufacturing group of our industry my sincere appreciation of the support and backing which it is evincing in my new undertaking.

The national tax situation presents a field worthy of the close attention of every management. As you doubtless know, our industry is paying the highest tax rate of any comparable to its size in the nation. Approximately one-tenth of our entire gross income is being paid out in national, state and local taxation. We are carrying this enormous burden in great part because in the past we have not emphasized with sufficient insistence the inequity of this heavy charge upon the users of so essential a public service as ours. One of the activities of the past year has been to get part of the story of our tax situation recognized by national and state legislators as well as the public. Only a start has been made along this line and much more must be done. Local companies can be of the greatest assistance in carrying out this work and not only help the industry nationally, but themselves locally.

Despite the general inclination of tax-levying bodies to impose taxes on public utilities, there is scarcely one in the country that will not recognize the right of electric railways to relief when the facts are clearly stated. The individual companies have been woefully negligent in working with public officials on the tax problem.

One of the heaviest single burdens that the industry is carrying is the series of special imposts, including the paving charges. Imposition of this tax began half a century ago, but no relief from it was afforded any company until 1909; then the Cleveland Railway was given help. A ten-year interval without further relief for a single company followed, largely because companies did not make their situation known to the public and law-making bodies. However, in the last six years, owing to the increased willingness of companies forcefully to present this problem to the public, paving tax relief has been afforded in several states and about 50 scattering communities. There are few cases on record where relief has been refused after a full presentation of the true situation.

We cannot expect law-levying bodies to assist us if we do not help them by making clear to the people who elect them that the legislators in relieving us of taxes are only doing the fair thing for the public, which, of course, in the final analysis pays the charge.

Now let us pass from the situations in which the public has a hand and examine ourselves and our industry from the inside. Let us try to help ourselves.

The Industry Has Means for Self-Help

A favorite expression in recent years has been the "sick local transportation industry." And because many believed it was sick they have looked about for a cure-all. Many so called cure-alls have been offered. Some have been helpful. More have not. But no one cure has been found. I am one of those who do not believe much in medicine. Perhaps because I had for a great many years as a near neighbor, dear friend and adviser the late Walter Camp, who, with his famous daily dozen and his doctrine of exercise, has, I think, done more than any other one man to improve the health of this generation, I became a believer in exercise rather than drugs. Physical ailments often respond more readily and effectively to exercise than to pills and doses.

In the same way I believe this industry of ours has needed and now needs more exercise and less dope. And believing this, I am suggesting a daily dozen for electric railway managements, which, if adopted and followed faithfully, will, I believe, go far in helping to bring our industry back to a healthy, normal state. They are very simple exercises and any management, whether prosperous or poverty stricken, can practice them. In fact, many companies have already adopted them to a certain extent and are finding the results most advantageous.

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Electric Railways Have Entered a New Era*

That Unlimited Possibilities Are Ahead Is Shown by Progress of Past Five Years—Regulatory Bodies Are Understanding the Problem, Fares Are Being Adjusted and Riding Has Increased —New Financing Has Permitted Physical Improvements

By Britton I. Budd

President Chicago Rapid Transit Company, Chicago, North Shore & Milwaukee Railroad and Chicago, South Shore & South Bend Railroad

MAKING a recovery that is almost without a parallel in American business, the electric railway industry has definitely entered a new era. There is evidence of this on every hand. It is clear to every executive who is engaged in electric railway transportation. We are in an epoch in which the possibilities are unlimited, one which challenges the courage and imagination and one which will bring prosperity to those with vision clear enough to see into the future and adjust themselves to the new and changed conditions.

In the comparatively short period since the close of the World War we have witnessed a virtual rebirth of the electric railway industry. It has become a transportation industry, embracing all forms of transit other than steam. We have seen a marked rebound from the hostility aroused through the necessary adjustment of fares to meet the vastly higher labor and other costs of producing transportation, this being expressed not only in the voiced attitude but in the wider use of electric railway facilities by the public.

We find state and municipal regulatory authorities acting with greater understanding of our problems. Very rapidly the economic absurdities written into franchises—unwitting impossibilities as respects performance either on the part of the railways or municipal officials; neither could possibly have foreseen the revolution that has come in transportation—are being wiped out. Both municipal officials and railways have found that what the people want is service; not slickly drawn contracts, which within a comparatively short time, because of the rapid change in methods of transportation and the necessities of the public, can have little or no meaning.

There is no thought of fixing the price of shoes by law at $4 a pair for 20 years, and equally so has the fixed price for transportation passed into the relic heap. There is appreciation that the fare must adequately cover the cost of production of transportation; that wages, interest, power bills, taxes and other costs are paid for, not in airy promises, but in the same kind of cash as that necessitated by other business.

No one believes horses will again pull street cars, and municipalities are rapidly wiping out the obsolete obligation on the electric railway rider of providing a racetrack for automobiles. No one believes a transportation company is going to rip up its rails, its power lines, its other properties and quit providing communities with transportation service at the end of any fixed franchise period of 20 or 30 years. Rather the people of the communities are coming to believe, and have a right to believe, that the local transportation agency should be in a position continuously to finance itself through attractive offerings.

It is only through a constant flow of new capital into the business that the extensions of service necessitated by the public can be made, for, as is well known, fares fixed by state regulatory commissions do not comprehend that additions to properties will be made out of earnings. Electric railway new money must be obtained in the open market, where all other industries are bidding for it. There is a growing realization that the investor will go where the prospects seem brightest and that he cannot be sandbagged into parting with his savings.

The public expects the electric railway company, as an established agency, with its skilled organization and financial responsibility, to obligate itself to provide the entire transportation for a community, whatever the changing conditions may necessitate.

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Now all of the changes have not been made nationwide. But they are coming fast, becoming so universal that the time seems short when they will certainly be so. And with each progressive step forward in improving operating conditions, the public's big problem of building up adequate transportation facilities comes closer to solution.

During the period of evolution we have seen the manufacturers of electric railway equipment putting forth their best engineering skill to meet the demands for modern transportation. Obsolete equipment is rapidly going into the scrap pile. We have, in large measure, met the demand for speed and comfort in travel, combined with economy. The public has answered with increased patronage.

Is that last statement so? Possibly it would be well,

OBSOLETE EQUIPMENT is rapidly going into the scrap pile. We have in large measure met the demand for speed and comfort in travel, combined with economy. The public has answered with increased patronage.

Where the conditions are right it is easily proved that there is as much bonafide earning capacity in the industry today as at any time in its history. —BRITTON I. BUDD

before we go further, to prove it, although you know of many examples. We will take some figures of companies operating in widely separated sections; communities of different sizes and characteristics, although, of course, where electric railway operation has a proper field. The accompanying table shows the gross revenue and net income of twelve electric railways for 1924 as compared with 1920. In these there has been a substantial increase in the net. Another system, the Milwaukee Electric Railway & Light Company, carried 146,208,335 revenue passengers in 1919 and 150,857,684 in 1924, its revenue in the later year being 0.0664 cent per passenger compared with 0.0550 cent in 1919. Operating revenues are not separated, as it is a combination company.

In Chicago we find both the Chicago Rapid Transit Company—the elevated railroad system—and the Chicago Surface Lines carrying the greatest number of passengers in their history. The latter, just at present, is a victim of the provisions of an antiquated franchise, but its physical properties and its financial condition were never better than now.

I can talk intimately of the Chicago, North Shore & Milwaukee Railroad—the North Shore Line—one of the companies of which I am president. In 1916, when the present management took hold, it had an investment of $12,251,997. At the end of 1925 the investment was $32,950,000; we have been constantly developing the property. We only recently placed an order for 20 additional combination passenger cars, three more dining cars, some refrigerator cars, and are adding materially to our motor coach fleet. We are just completing construction of the Skokie Valley route, an additional main line route, which will greatly facilitate our express speed between Chicago and Milwaukee, permit us greatly to develop our freight business and, in addition, open up a beautiful new section of country for residential

GROWTH OF OPERATING REVENUE AND GROSS INCOME FOR TWELVE ELECTRIC RAILWAYS, 1920-1924

	Operating Revenue 1920	Operating Revenue 1924	Gross Income 1920	Gross Income 1924
Boston Elevated Railway	$33,750,862	$34,045,581	$7,119,527	$7,329,190
Chicago, Aurora & Elgin R.R.	1,760,028*	2,318,570	297,094*	544,191
Chicago, North Shore & Milwaukee Railroad	4,193,669	6,198,987	823,208	1,311,302
Chicago, South Bend & Northern Indiana Railway	1,249,349	1,377,515	.....	.....
Cleveland Railway	17,382,358	17,313,549	1,408,318	1,913,993
Dallas Railway	3,200,392	3,325,517	319,989	693,885
Gary Street Railway	878,032	998,418	159,369	172,512
Indianapolis Street Railway	5,367,936	5,588,177	790,597	1,120,073
Kansas City Railways	11,058,186	10,024,230	736,019	1,256,431
Los Angeles Railway	9,135,151	12,845,948	2,223,281	3,763,134
Pittsburgh Railways	21,137,223	22,063,777	2,514,459	4,409,542
San Diego Electric Company	1,379,032	1,482,832	161,897	220,356

* 1921

purposes. Our investment in this new line will be about $9,000,000.

The situation as regards the Chicago, South Shore & South Bend Railroad, of which I only recently became president, is interesting.

In that instance, the companies under the management of Samuel Insull and associates provide the electric light and power and gas service of practically all of the territory through which the electric carrier operates. It was believed that the electric road could be made an important factor in the development of that territory. Then, too, the right-of-way is through a section already heavily populated with industries and seems destined to become the center of steel manufacture of the world.

The road, in spite of the extraordinary territory served, had defaulted interest for many years. Immediately upon taking over the management we started reelectrification to convert it into a high-speed electrified railroad. We are providing it with the best equipment to be had, including diners and observation cars and good freight facilities. We have already increased the service, even though our improvement work, which will cost in excess of $4,500,000, is, at this time, only about half completed. We are hopeful that the road can be brought to such a high standard as to make it a transportation agency of real service to the people.

The figures given are somewhat startling, coming from an industry that has faced a highly competitive situation from other forms of transportation. Do they prove that every electric railway company, wherever situated, however managed and however financed, is successful? Not any more than such impossible conditions could be fitted to any other business.

A million dollar department store in the Sahara Desert wouldn't get much business. Neither does an electric railway which does not start anywhere or end anywhere, which does not operate through traffic producing areas, which is not on its toes meeting competition, whose engineering is not such as makes its operation of a character that meets modern conditions, or which has a top-heavy financial structure. Such a railway has no more chance of success than any other industry loaded with corresponding burdens. But where the conditions are right, it is easily proved that there is as much bona fide earning capacity in the industry today as at any time in its history.

Discussing the statement of President Alfred of the Père Marquette Railroad, who prophesied that in the future steam railroads would be running on tracks laid on a concrete bed, at speeds rivaling aircraft, the Chicago *Tribune* said editorially:

There are three problems the railroads must face. One is the competition growing out of the increased use of automobiles and trucks. The second is the competition growing out of air transportation. The third is the

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crystallizing public sentiment against the smoke and soot of the steam locomotive.

. . . Speed is the answer to the airplane; speed and the safety which it will take aircraft a long time to attain. Comfort is the answer to the airplane and automobile, comfort at 60, 70, 100 miles an hour. . . . To the threat of the automobile and the demand for clean transportation, the answer is already clear—electrification. . . . One-car units for short hauls will go far toward meeting bus and truck competition.

The change which has come about in our industry, even in the last five years, has been almost revolutionary. It has been as marked, for example, as that seen between the service given by the highly efficient American Telephone & Telegraph Company and the small rural line. In the case of the former we see the latest equipment that the world's best engineers can produce; in the latter, the old type where your number is "fourteen long rings and twelve short."

Within the last two or three years we have seen an increasing number of companies engaging in motor coach transportation as an auxiliary to railway operation. These companies have not only modernized their railway service but they have met the demand for rubber-tired transportation and shown themselves capable of serving the needs of their communities to the fullest degree.

In the interurban field we have seen some of our companies develop into high-speed, electrically operated railroads, with roadbed and equipment comparable with that of the transcontinental steam railroads. We see some of these lines handling freight and interchanging cars with the steam railroads and developing a business at once profitable to themselves and to their customers.

The adaptability of the electric railroad to this class of business has been conclusively shown. There is a demand on the part of merchants and manufacturers for the fast service which the electric railroad is capable of supplying. That is a subject to which our executives should give the closest attention, for I am convinced that there we have a wonderful field for real service.

I do not believe that any business has ever so clearly demonstrated its fundamental soundness as has the electric railway industry. Its remarkable virility and recuperative powers have been the wonder of investment bankers and investors. Its securities, which a few years ago were shunned by investors, are again taking the position in the money market which the importance and the soundness of the industry warrant.

Some of the important utility industries take pride in the fact that they went through the World War in good shape. The electric railway industry not only went through the war but through the same kind of fire for several years after the war ended and has emerged stronger and better equipped to serve the public than ever before.

"There is nothing either good or bad but thinking makes it so." Some, even yet, do not appreciate the fact that the sun is already shining upon our business, inviting them to roll up their sleeves and take advantage of the opportunities offered them. They are still weeping, but the busy world gives no sympathetic ear. They weep alone.

Some of us have always been optimistic. We have appreciated that there is $6,000,000,000 of capital invested in electric railroads. We have believed that for mass transportation nothing has yet been devised that can take the place of the electric car running on rails, nor is there likelihood of any adequate substitute being found. We have seen our urban population growing much faster than our rural population, which means an ever-increasing demand for electric railways. We have had faith in our industry and its future and today we are seeing our hopes and expectations realized.

When I was president of the American Electric Railway Association I preached modernization and correct financing. I said that where this was practiced, electric railways would prove good investments. I did not believe then, nor do I believe now, that the problems confronting our industry differ from those met in other kinds of business.

I believe the events of the last two or three years have fully verified my optimistic predictions.

I am ready to go a step farther today and predict that within a comparatively short time the motor coach and all other gasoline-propelled forms of transportation now for hire by the public will be controlled by the steam and electric railroads of the country. I am satisfied that the public will demand this extension of our railroad service, if the industry itself does not take the initiative. We are in the transportation business, and it is up to us to give the public what it wants.

I PREDICT that those electric railways which are correctly financed and whose management is progressive and alive to the demands of the communities they serve have a great era of prosperity ahead of them.

This feeling of optimism which I have is shared by many others who are in close touch with recent developments in the electric railway field. —BRITTON I. BUDD.

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Every executive here has felt the more sympathetic attitude of public officials and of the riding public toward our industry. The changed attitude of the regulatory authorities was well expressed by Harry G. Taylor, member of the Nebraska State Railway Commission and past-president of the National Association of Railroad and Utilities Commissioners, in his address before the annual convention of the American Electric Railway Association on Oct. 8, 1925. In printing that address *Aera* gave the paper a heading which read:

Era of Political Tinkering with Street Railways Is Closing

Demagogues Are Finding Out that Ordinances Fixing Unremunerative Fares Do Not Overthrow Economic Laws; Transportation Undergoing Readjustment and Railway Men Must Get New Viewpoint

Those are the views of a man who knows, one who has acted as a judge and impartial arbitrator. We who are in touch with the situation know that he is right. The situation has changed and the future is bright.

There may still be among us some who look upon the private automobile as a menace to our industry. But

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if it has been a serious competitor, especially in the smaller communities, it has also worked indirectly in our favor. It has developed the riding habit in the people. One statistician estimates that the people of America traveled 1,703 passenger-miles per capita in 1925, compared with 618 miles in 1910. Whether this is a fair estimate or not, we all know that the riding habit is growing. The convenience of the automobile has developed that habit and it will continue to grow. The electric railway is getting and will continue to get its share of this increased riding. The share which we will get will depend on the character of the service we give the riders and how closely we will approximate the comfort and convenience of the automobile.

The automobile has educated the public in another way. It has given the public a lesson in the cost of transportation. The owner of the private automobile has found that it costs him from 10 to 20 cents a mile to supply his own transportation. He has learned that this is a heavy drain on the family exchequer. He will continue to use his automobile for pleasure riding when taking his family for a Sunday outing, but for ordinary transportation, other than business, he is finding out that it does not pay. With the experience he has had with his automobile, a 10-cent fare on the electric railway does not look as large as the old nickel fare.

In most of our large cities the automobile has almost reached the point of saturation. Reasonable speed is no longer possible on any of the heavily traveled thoroughfares. This condition is literally driving thousands back to the electric railways. Aside from the greater economy, they are learning that they can save time by using the railways in going to and from their places of business. If this trend back to the electric railway is to continue, it must be encouraged by the railways. The automobile has bred in the average American the desire for luxury in transportation. He is not as much interested in what it costs as in the character of the service. He wants to have the best that is obtainable and is willing to pay for it.

If the electric railways have transportation to sell that is fairly competitive with the automobile they will get the business, but we cannot afford to wait for it to come. We must go after it just as do other business concerns. The mere running of cars on a street or across the country will not of itself get business. This country is organized on a too highly competitive basis for that. To make a transportation company pay requires a definite selling policy. It requires the same sales effort as we see put forth by the manufacturers of "Quaker Oats," "Palmolive Soap," or any other highly advertised commodity. The selling of transportation is not an amateur's job, either. It is one which calls for experts who are highly trained and experienced in solicitation work. It takes a real live selling organization capable of meeting stiff competition.

Advertising isn't just so much space in a newspaper. It is what your advertisement says that counts, not what it costs. We have probably as many electric railway men who think they are good advertising men as we have editors who think they could run a railway better than those who have made it their life work. If advertising does not sell what we have to offer the public, it is worthless. If a company feels it cannot afford to employ advertising experts, it will find the newspapers ready to lend their assistance.

Public relations is not a hobby. It is a thing which must be worked at and cultivated every hour of the day and every day of the week. It is not something that is confined to what is known as a "public relations" department. Every act performed by an employee who comes into contact with the public makes for good or bad public relations. Every employee who has to do with the maintenance of equipment or the upkeep of the property is making good or bad public relations, even though he may not come into actual contact with the public. His work shows, and if cars are not kept clean, windows are not washed, stations are untidy, roadbed is in bad repair, all that makes for bad public relations.

In this connection I wish to add a word about publicity. What is it? It does not mean boasting about a company or trying to make the public believe something that is not true. It means telling the public frankly and truthfully what the company and its employees are doing. We are engaged in rendering a public service; we are a quasi-public institution, and the public is entitled to know everything about this business in which it is so vitally interested. It is surprising, too, how much the public is interested in our problems. That is seen when some representative of a company speaks before a civic organization, a woman's club, a church organization, a university, college, or a public school. Such audiences are not only attentive listeners, but they propound many questions which show their eagerness to learn more about the details of our business. They are not hostile critics; they are eager to learn the facts.

This program of carrying our message direct by word of mouth to the public is one of comparatively recent development. It is one that is proving effective in developing good public relations. It is of great educational value, not only to the public, but to the representatives of the company who make such talks. It stimulates their interest in their work and in the company, because they necessarily must inform themselves on the various details before they can undertake to enlighten others.

In conclusion, I wish to emphasize my faith in the future of electric railways. I appreciate the fact that there are obstacles to surmount. But there are problems to meet and solve in every line of business. This is not peculiar to our business. Our problems are no greater than those of many other businesses, and I know that we have in the electric railway industry men who are capable of grasping the vast transportation opportunities which lie ahead and of turning them to the advantage of the public which we serve.

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Modern Cars— Not a Panacea, but an Essential Step*

Replacement of Obsolete Equipment Is a Problem of Economics—Many Examples Show That New Cars Will Pay for Themselves in Many Cases with an Improvement of Good Will—Manufacturers' Engineering Committee Is Making Economic Studies and Preparing Designs for Improved Cars

By Charles Gordon
Assistant Vice-President McGraw-Hill Company, Inc.

ACCORDING to the program, I am scheduled to talk about the economics of modern cars. Last summer I talked about their style. Any one who has a growing daughter will appreciate the logical sequence with which the program committee has carried me forward from style to economics.

But the word "economics" looks cold and uninviting in type. It tends to make you feel that the subject is heavy. You would probably skip over an article with such a head and promise yourself to read it when you get time. I shall therefore exercise the editor's prerogative of giving attention to his headline by calling my subject "Modern Cars —Not a Panacea, but an Essential Step."

Nevertheless, the subject is a matter of economics. The question is, Do new cars pay? If you will bear with me for just a moment I would like to put that another way, Do old cars pay?

There are several important factors involved in determining the answer to that question that do not appear on the account ledgers. These include, among other things, the effect of the condition of equipment on the public's attitude toward the railway; the effect on the morale of platform employees, on the regularity and speed of the service rendered and on the accident record of the property. But for the moment I wish to consider the two factors that directly affect the color of the figures on the ledger, namely, income and operating expense.

If we pride ourselves on any one thing in this industry it is the accuracy and completeness of our operating accounts. But how many properties can answer the question, "Do old cars pay?" by consulting their accounts. How many can tell from their records when the economic life of their equipment has been reached?

THERE HAS BEEN much discussion of what the proper life should be for electric railway cars. The final answer to this question is a matter of economics. Age alone is of little significance except when viewed in the light of developments in the art. Recent years have brought many improvements in cars. There is room for many more. But on the basis of actual progress that has been made in design since many existing cars were built, serious consideration should be given to their replacement. . . .

That life is most economical which at its end shows the greatest net earnings for the car.

Modern cars are not a panacea. They will not take the place of good management, but they are a part of good management. When combined with the modern merchandising viewpoint the entire status of some properties has been altered.

It so happens that an illustration I have in mind is drawn from a company operating buses in tour service. This is an old and seasoned organization. In general, bus accounting practice is still comparatively crude. But in the case of this company, which operates more than a hundred vehicles, the earnings, operating and maintenance costs for each vehicle are known at the end of the year. Its buses were purchased in groups over a period of several years. All of them are of the same type and manufacture. Each group is designated by the year of its purchase. The operating and maintenance accounts are recapitulated so as to show a comparison for the various groups. One can tell when the operating and maintenance costs on the oldest group have become so high that the saving on new buses will show a favorable return on the money invested in them. This company scraps its old equipment on that basis. Its rates are regulated. The company uses its records as a means of establishing rates of fare that permit uneconomical equipment to be scrapped when it has served its useful life.

How many railway companies are handling the economics of cars on that basis? The life of a bus is comparatively short. For that reason, in the case of the company I mentioned, the subject of replacement is an important one, and the method of accounting in use was developed to take guesswork out of the all-important question of scrapping uneconomical equipment. The very fact that the life of electric railway cars has been considered to be almost indefinite is probably responsible for such a method of procedure not being followed generally in electric railway accounting practice. As a result, in many cases the economical life of cars has been overestimated. The factor of obsolescence has not been properly evaluated.

Here we find the basic reasons for the condition of

*Abstract of a paper presented before the Central Electric Railway Association, Indianapolis, Ind., Jan. 28-29, 1926.

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electric railway equipment today. The average property cannot answer the question "Do old cars pay?" from its records; that's why there are so many of them still in service.

In the mind of the man on the street the status of the railway industry and the condition of a given property are determined by his contacts with it. To him an electric railway consists primarily of the cars and the men on the platforms.

The importance of the contacts between employees and the public is generally accepted. But the effects produced by the condition of the equipment have in many cases been overlooked. The appearance and condition of the cars have a direct influence on the attitude of the passenger toward the railway and also on the morale of the employees themselves. A man is a better, prouder and more courteous employee on the platform of a new, attractive car than when the equipment is old and obsolete. When a motorman takes out a new car he does so with the feeling that it is a good piece of equipment and he has some regard for the way in which it is operated. The resulting effect on passengers is obvious. In a paper some time ago W. C. Bolt of the Eastern Massachusetts Street Railway testified to the effect of new cars on the morale of maintenance men. When such a car comes into the shop the men feel that it is worth repairing.

EXPERIMENTAL AND DEVELOPMENT work is expensive. At the present time there is a lack of incentive for manufacturers to undertake such expenditures. The large variety of motors, trucks and cars that are required to meet the demands of a comparatively restricted market has been a powerful drag on development.

Money spent for remodeling cars that have been in service fifteen to twenty years often merely postpones the day when up-to-date equipment can be purchased.

Leaders of thought in the industry have been convinced for some time that this subject of replacing obsolete equipment is of paramount importance. Surrounded, as we are, by other forms of transportation, where replacement proceeds at an amazing pace, the electric railways have suffered by comparison, so that, to the popular eye, they have seemed to be moving backward. The obvious method of bringing about improvement is to examine carefully into the state of affairs and then to present the results to the industry. This ELECTRIC RAILWAY JOURNAL has recently endeavored to do. In co-operation with the American Electric Railway Association, and with the aid of the General Electric and Westinghouse companies, which had collected considerable data on the subject, a survey of the age of electric railway cars was made and published on Jan. 2, 1926. The condition found speaks for itself. The picture is not a particularly attractive or complimentary one. Nevertheless, if we are to make progress, we cannot afford to overlook present conditions. It is far better to determine the facts and then to look for ways and means of improving the situation.

In this survey electric railway passenger cars were grouped in five-year periods: 14.2 per cent of the total number of cars are more than 25 years old, 19.8 per cent fall in the period between twenty and 25 years, 20.5 per cent have seen from fifteen to twenty years of service. A total of 34 per cent are twenty years of age or older.

PROPER LIFE OF THE CAR AN ECONOMIC QUESTION

There has been much discussion of what the proper life should be for electric railway cars. The final answer to this question is a matter of economics. Age alone is of little significance except when viewed in the light of developments in the art. Recent years have brought many improvements in cars. There is room for many more. But on the basis of actual progress that has been made in design since many existing cars were built, serious consideration should be given to their replacement.

That life is most economical which at its end shows the greatest total net earnings for the car. In other words, a car should be disposed of just as soon as a comparison of the operating and maintenance cost and merchandising value of the old and new shows that it can profitably be replaced. The trouble has been that railways have clung to the old equipment for many years when plain economics would have shown that it should long since have been replaced simply on the basis of economies made possible by developments in the art.

The common plea has been that money could not be raised to buy new cars. In some cases that has been true. It has been repeatedly demonstrated, however, that in most instances when the railway has the will to modernize it is possible to finance new equipment on the basis of the savings in operating cost that can be shown. At least one large car builder makes the statement that no electric railway has ever defaulted on an equipment trust. An inquiry among car builders reveals that applications for the purchase of cars on equipment trusts are very rarely turned down. In most instances the builder is ready to back the judgment of the railway in financing cars on a basis under which the increased earnings and reduced expenses will return the cost of the cars.

Modern cars are needed to meet modern conditions. The car designer holds the key to public approval and increased patronage. Application of the same principles that lead a merchant to give careful thought to the appearance of his store front will attract more riders and make more friends for the railway. It is obvious that the most expensive car is the one that attracts no patronage.

There has come into car construction practice a definite attempt to provide more comfort for the passengers and to make cars both attractive and pleasing in appearance. The subjects of painting, of design to get streamline effect and to overcome stubby appearance in the smaller cars, the use of plate glass and pleasing decorations are receiving attention. Even the subject of color effects on the interior is beginning to be discussed with new interest by railway men.

It is well to note here that the bus has been brought to its present state of development by its manufacturers. As its use by electric railway companies has increased, there have been many demands for changes from the manufacturers' standard designs. If such demand lead to continuous improvements by the manufacturers it will be a healthy influence. If it leads to the breaking down of manufacturer initiative and fills his shop with many varieties of special jobs it will check orderly develop-

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ment and will change what is now a manufacturing business into a contracting business, as it has done in the case of electric railway cars.

The car designer is not limited by the necessity of carrying his own power plant as is the bus man. Neither is he limited by the clearances on narrow highways. There is more room to provide facilities for boarding and alighting passengers. With a growing interest in the advantages of improved cars and under the stimulus of the expanding market which such interest will give, we may look forward to an era of rapid development and improvement in the electric rail car.

Noise Reduction May Influence Design

The subject of noise reduction is receiving much attention. Whether or not this will ultimately lead to a change from the present method of driving a car is at present difficult to foresee. Most car and truck builders feel that the simplicity of the present form of construction is an asset that should not be discarded in favor of a more complicated construction. There is, however, only limited opportunity of reducing noise under these conditions.

When the present form of construction came into general use the art of gear manufacture was in a comparatively crude state. The automobile has brought about an amazing development both in speed reduction mechanism and anti-friction bearings which permit close fits and accurate gear alignment. Little has been done toward the adaptation of such devices to street cars. Such a step involves a period of courageous development and experiment. By removing much of the present unsprung weight on the axles it offers the opportunity of materially reducing noise, and wear and tear on track.

It is the opinion of some designers that changes from the conventional design would increase the cost of maintaining equipment. Whether or not the advantages of a change from the present simple construction would outweigh the disadvantages can be determined only by experience. Although this is a matter of design, its solution is a problem in economics. Experimental and development work is expensive. At the present time there is a lack of incentive for manufacturers to undertake such expenditures. The large variety of motors, trucks and cars that are required to meet the demands of a comparatively restricted market has been a powerful drag on development.

Two constructive influences which may bring about a change in this condition are at work. A special committee of manufacturers is at present endeavoring to determine some basis for reducing the number of types and sizes of equipment. Such a simplification would greatly decrease development expense and would thereby stimulate improvement in cars and apparatus. This group of specialists, working as a committee of the American Electric Railway Association, is co-operating with the committee on unification of car design. Combined with this activity, increased appreciation of the advantages of new and improved cars will offer an additional incentive to development under the spur of competition by opening up an expanded market. Such interest is growing rapidly.

Many examples are available of the advantages which follow the replacement of obsolete equipment. Modern cars are not a panacea. They will not take the place of good management, but they are a part of good management. When combined with the modern merchandising viewpoint the entire status of some properties has been altered.

A comparatively small increase in the number of passengers carried, resulting from the attractiveness of new equipment, will show a handsome return on the investment in new cars. Savings in operating and maintenance costs per year in comparison with old and obsolete equipment have in some cases run above 20 per cent of the new-car cost. The effect on public relations has in many cases been beyond the possibility of measurement in dollars and cents.

A striking example is offered by the experience of the Buffalo & Erie Railway, operating a 92-mile line between the two cities from which it takes its name.

IT IS WELL TO NOTE here that the bus has been brought to its present state of development by its manufacturers. As its use by electric railway companies has increased, there have been many demands for changes from the manufacturers' standard designs. If such demand lead to continuous improvements by the manufacturers it will be a healthy influence. If it leads to the breaking down of manufacturer initiative and fills his shop with many varieties of special jobs it will check orderly development and will change what is now a manufacturing business into a contracting business.

This road was a losing venture from the day it was completed. It was in receivership for about nine years and its condition seemed hopeless. Its present owners thought differently. They backed their opinion with their money, and the results accomplished in the short period of a year amply justify their faith. But these results would have been impossible with the old cars. Others tried it and failed. The complete replacement of the old equipment was the starting point. That made possible many steps that followed rapidly. The results accomplished were dependent on providing a type of equipment which could compete with the automobile in speed and comfort, and at the same time would permit frequent service to be given. In the face of a severe local industrial depression on its lines that practically wiped out the short-haul industrial rider, service was increased to the extent of 16.7 per cent in car-miles over a corresponding ten-month period with the old equipment. Seat-miles were increased 33.4 per cent. The improved service attracted transients and former automobile riders for the longer hauls. Consequently, although total passengers carried decreased 14.7 per cent, the average length of ride increased, and the receipts per passenger rose 31.1 per cent. At the same time the operating expense per car-mile decreased 27.3 per cent. An increase in schedule speed of almost 10 per cent was made. For the first ten months of 1925 the net income was $131,024.42, in comparison with $14,335.89 for the corresponding period of the previous year.

The experience of the Lexington, Ky., property is too well known to require detailed discussion. Suffice

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it here to note that at the end of the first year of operation with new equipment operating revenue increased 12.7 per cent in comparison with the previous year and operating expenses decreased 13.2 per cent, while service was increased to the extent of a 38.3 per cent increase in car-miles operated. The number of late trains was reduced 64.2 per cent. Net revenue was doubled.

Lack of time permits only a mention of some of the properties where the effect of modern cars warrants careful study by the industry. Introduction of new cars in Brooklyn, which made possible operation at higher schedule speed, while at the same time reducing power operating and maintenance costs, resulted in an increase of 28.2 per cent in the number of passengers carried on two typical lines in comparison with the same lines a year before when they were operated with old equipment. So far as the management was able to determine no fundamental changes had occurred which could account for the increased traffic other than the attractiveness of the service rendered with the new cars.

In January, 1925, the Interstate Consolidated Street Railway, operating some 30 miles of track serving the group of Massachusetts towns known collectively as "the Attleboros," was purchased out of receivership at a time when the line was faced with the possibility of shut-down and was showing an operating loss of approximately $120 per day. Service had been rendered with a miscellaneous collection of 35 cars of various types, both closed and open. New equipment made possible savings in operating costs alone that more than justified their installation.

When service is discontinued on an electric railway, due frequently to the combination of excessive local restrictions and artificial operating burdens imposed by an uninformed public, the example is seized as an evidence of the decadence of the entire industry. Frequently such suspension of service is no indication that the electric railway in that location has outlived its usefulness under proper operating conditions. New equipment has in several instances been the means of securing very much better co-operation from the community. The New Haven & Shore Line Railway, a 34-mile interurban line running from New Haven, Conn., east along the edge of Long Island Sound, was shut down and abandoned for more than four years. In the fall of 1924 service was resumed with new equipment. During the first few months of operation passenger revenue was built up sufficiently to pay operation and interest charges and to keep the line in service.

Approximately two years ago the Ohio Valley Electric Railway at Huntington, W. Va., was operating a miscellaneous lot of rolling stock of various types, sizes and weights. It was discovered that this was costing an excessive amount for maintenance, was making a bad impression on the public and at the same time was causing rapid deterioration of expensive track construction. The property was entirely re-equipped with 40 new cars of uniform type. The resulting saving in cost and the effect on the attitude of the communities served have demonstrated the wisdom of the action taken.

The effort in Grand Rapids to popularize street car riding by providing a more attractive type of equipment has been watched by the entire industry with a great deal of interest. On the Cherry line, where the three sample cars were placed in service last summer, riding was increased an average of 7,240 passengers per month over the corresponding period of the previous year. This was during the months of June, July and August, when automobile traffic is at its highest and when railway riding usually showed a severe drop. During the period of observation riding on the system as a whole was lower than in the previous year. During the month of August the increase on the Cherry line was 10.46 per cent. In a direct comparison of the riding on the three sample cars with the other cars on the same line, they showed 63 per cent more passengers. Part of this may be attributable to novelty. But it certainly indicates that car improvements attract the attention of the public and build riding.

We could go on with many other examples of properties on which the replacement of obsolete equipment has been followed by results that warrant careful study. This list would include a number of properties in the C. E. R. A. territory. The experience of Pittsburgh, Hannibal, Mo.; York, Pa.; the Evansville & Ohio Valley Railway, the Illinois & Fox River Electric Company, the Eastern Wisconsin and the Illinois Valley division of the Illinois Traction System are worthy of attention. On this latter line results in 1925 compared to 1923 show a saving in operating cost equal to 21 per cent of the investment in the cars and an increase in passenger revenue amounting to 17 per cent of the car cost. At the same time an hourly service was given in comparison with two-hour headways in 1923.

THE INDUSTRY ON A FIRMER FOUNDATION THAN EVER

The electric railway industry has survived through a period of serious economic and operating handicaps. It continues today, more clearly than ever before, to occupy a firm position as a fundamental basic necessity in modern community development. Among those who are in position to view conditions in broad perspective, there is a growing conviction that the industry is on the threshold of an era of renewed prosperity. The public is being gradually enlightened in several notable instances.

The last, and what seemed for a time the greatest, burden, namely, automotive competition, is in some respects not an unmitigated evil. It has not only caused a vastly increased riding habit in the form of a desire to move about more frequently but it has also brought into railway ranks a new point of view on transportation.

The chief function of a railway company is to sell rides at a profit. This purpose is accomplished only when it succeeds in rendering satisfaction to the public. It is only when the railway is furnishing a form of transportation superior to any other of equal cost and showing a tendency to improve and progress as conditions change that favorable results may be expected. Again this is a matter of economics. Success today in transportation is dependent on creating demand through improvement of the product. The blind following of precedent frequently leads to the toleration of a great many really obsolete practices. It is therefore very desirable that railway men compare the progress of their industry with that made in other lines of business and try to withdraw themselves far enough from the immediate detail problems of the moment to get a perspective of their own tools as they appear to others. Having this viewpoint, there may come the necessary inspiration and ideas for accelerated progress.

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Extensive Rapid Transit Plan Proposed for North Jersey

New Electric Railway System Comprising 82.6 Miles of Route Recommended in Report of Commission—Distributing Unit of System Would Be an Interstate Loop Line, 17.3 Miles Long, Costing $194,000,000, Including Equipment—Double-Track Line to Battery to Be Built First

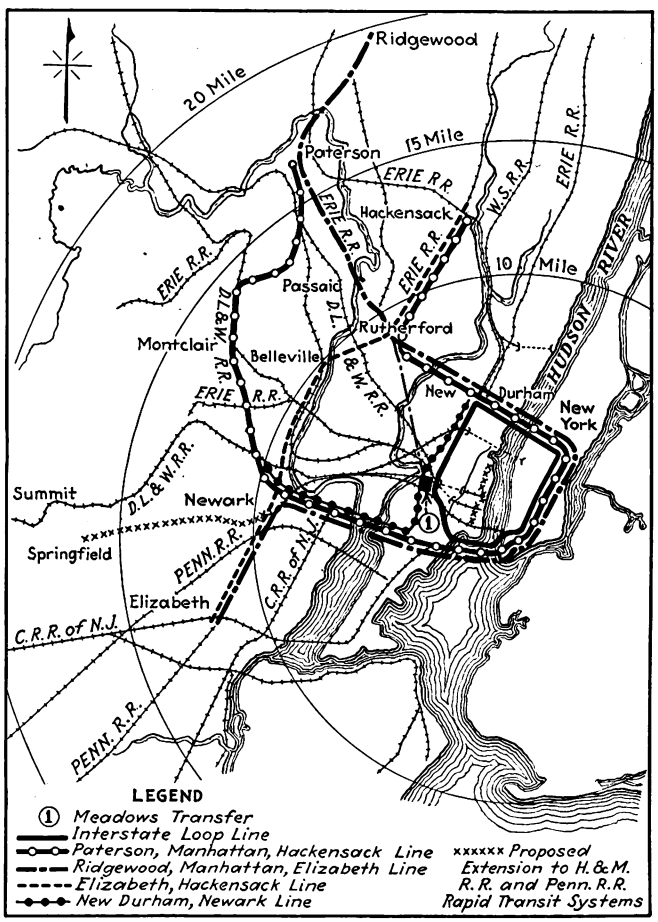
PRINCIPAL features of a comprehensive plan for passenger transportation between communities in the nine northern counties of New Jersey and the city of New York are outlined in a report submitted on Jan. 15 to the Legislature of the state by the North Jersey Transit Commission. A preliminary report presented about a year ago was abstracted in ELECTRIC RAILWAY JOURNAL for Feb. 7, 1925, page 222. The ultimate object of the program recommended is the creation of a new electric railway system comprising 82.6 miles of route, and the electrification of 399 route-miles of railroad now operated by steam. As the first step it is proposed to construct an interstate loop line 17.3 miles in length connecting with all of the north Jersey commuters' railroads and passing under the Hudson River into New York City by two tunnels, one uptown and one downtown. A new low-level subway through Manhattan would complete the loop. Construction costs of this preliminary project are estimated at $154,000,000, with $40,000,000 additional for equipment. The cost of power facilities is not included in this estimate.

In developing the plan three separate problems were considered. The first was to furnish rapid transit facilities for the area within 20 miles of New York City and to connect this area with Manhattan by facilities providing service comparable to that of present subways. The second problem was to provide eventually for a commuter or suburban transit service for the area within 40 miles of New York City. The third was to utilize the existing rapid transit facilities, the Hudson & Manhattan, the Interborough and the Brooklyn-Manhattan systems to serve North Jersey more effectively than at present.

As the result of the study of these problems the commission has recommended a program consisting of six principal parts. Listed in the order of their importance, they are as follows: (1) Construction of a new North Jersey rapid transit system. (2) Hudson & Manhattan Railroad extensions in New Jersey. (3) Interborough extensions of its Manhattan lines to New Jersey. (4) Brooklyn-Manhattan Transit system extensions from Manhattan to New Jersey. (5) Extension of north Jersey rapid transit system, listed as part one of this program, to serve a larger area. (6) Electrification of existing steam railroads.

Construction of this comprehensive system cannot be realized in any large way at the outset, the report states. Its tremendous cost alone precludes such a realization. It is outlined only as a guide to present and future transit development in this region.

The North Jersey rapid transit system, part one of the program, would consist of the following five lines: (1) Interstate loop line, running north and south between the Hackensack River and Bergen Hill in New Jersey, passing under the Hudson River via a tunnel at the Battery, up through Manhattan to 57th Street and back through another tunnel to New Durham. Its length would be 17.3 miles. A so-called Meadows transfer station would be located near the intersection of the Erie and D., L. & W. Railroads. (2) A line from Paterson through Montclair and Newark, following the interstate loop route through Manhattan to New Durham and thence to Rutherford and Hackensack. The length of this route would be 41.9 miles. (3) A line from Ridgewood via Paterson, Passaic, Rutherford, New Durham, the interstate loop route in New York City, to Newark and Elizabeth. Route mileage would be 39.8. (4) An intrastate route from Elizabeth through Newark and Rutherford to Hackensack, 18.8 miles in length. (5) Another intrastate line from New Durham to Newark, 13.0 miles in length. The location of these routes is shown on an accompanying map.



Operation Diagram of the North Jersey Rapid Transit System Showing the Five Routes Proposed by the Commission

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Total mileage for the five routes would be 130.8, of which 48.2 miles would be duplication because some routes operate over the same tracks as others. The net total route mileage would be 82.6. Construction cost of the entire undertaking is estimated at $260,000,000 with $122,000,000 additional for equipment, or $382,000,000 altogether.

Because the expense of building this system is thought to be too great to permit proceeding with it as a single project, the commission suggests that it be undertaken progressively. The interstate loop line constitutes the Manhattan circulating and distributing unit for the whole system and it is held to be logically the first construction step.

Present Suburban Facilities Saturated

During 1924 the suburban railroads and ferries serving northern New Jersey transported to and from their terminals 246,000,000 passengers. Of these 201,000,000 were railroad passengers. A 24-hour traffic survey was made by the commission and the railroads working in co-operation. On the day of the survey 264,000 New Jersey commuters arrived in New York City, of whom 204,000 were railroad passengers. During the maximum half-hour period in the morning between 8 and 8:30 more than 25 per cent of the daily one-way traffic was carried, amounting to about 97,000 passengers. This is the real tax on the suburban transportation facilities. Some 71 railroad trains arrived at all the terminals combined during this period, or one train every 25 seconds on the average.

This state of affairs has almost saturated the existing suburban facilities serving northern New Jersey. The railroad and ferry traffic during the past ten years has increased about 46 per cent, or at an average rate of about 4 per cent per year. The need for relief is so urgent, the report states, that temporary measures must be resorted to at once. This is the basis upon which the plans of the commission have been developed and upon which its recommendations have been made, despite the fact that piecemeal rapid transit development is thought to be undesirable.

Alternative Means of Relief

It is recognized that there are two ways of serving the north Jersey commuter traffic. First, additional terminal facilities might be provided to relieve the present and increasing congestion. This would require all passengers to alight at the terminals just as they do now and to find their way by other facilities to their destinations. Second, the existing terminals might be abandoned and through service to New York City established, thereby delivering all passengers directly to their destinations without requiring them to transfer or use any other facility. The second is the alternative which the commission believes should be adopted.

To throw light on how the New Jersey lines should be routed, the traffic survey made by the commission included investigation of the actual destinations of the Manhattan-bound New Jersey traffic. Distribution of this traffic after reaching Manhattan is shown in the accompanying table.

Although the New Jersey traffic enters from the west, slightly more of it is bound east of Broadway than west of Broadway. The respective percentages are 52 and 48.

Analysis of the traffic distribution in Manhattan indicates, according to the report, that the first additional transit facilities provided for New Jersey should enter at or near the Battery, and be routed up through Manhattan at least far enough to serve the 59th Street district.

Having determined that the north Jersey rapid transit line should cover Manhattan north and south, the next thing was to determine the streets along which it should be routed. A rapid transit line will conveniently serve a district a half mile on each side of the line, the report states. Manhattan Island at Chambers Street is about 1 mile wide, its width gradually decreasing to nothing at the Battery. Therefore a north and south line located anywhere below Chambers Street will conveniently serve that area. Above Chambers Street Manhattan increases to about 2 miles in width at Canal Street, and from there north to 125th Street its width remains constant. North of Chambers Street two lines located about half a mile away on each side of the center will conveniently serve Manhattan from river to river.

DISTRIBUTION OF NEW JERSEY RAILROAD COMMUTER TRAFFIC IN NEW YORK CITY

Destination District	Per Cent of Total Traffic
Below Chambers Street	38
Chambers to Fourteenth Street	14
Fourteenth to 33d Street	15
33d to 42d Street	12
42d to 59th Street	10
North of 59th Street	5
Brooklyn	5
Queens	1
	100

Eventual construction of two lines up and down Manhattan are recommended. It is proposed, however, to construct only one such line at the start, and the East Side line has been selected for the reason that it enters Manhattan from the west and therefore will have to cross all the west side and central New York City rapid transit lines. In this way it will furnish its passengers with easy transfer facilities to such lines.

The proposed route is from the Battery under Washington and Barclay streets, Park Row, Mulberry Street, Lafayette Street, Irving Place, Lexington Avenue and 57th Street to the Hudson River. The loop will be a two-track line for its entire length excepting only a short distance in New Jersey where it will be four-track to permit Hudson & Manhattan trains to operate to the proposed Meadows transfer station. All under-river tunnels and all underground portions of the line will be constructed large enough to accommodate standard steam railroad equipment so that electric locomotives may haul commuter trains and standard steam trains around the loop pending the electrification of the suburban lines, after which it is assumed that multiple-unit equipment will be used.

Because it would be utilized in both directions the capacity of the proposed interstate loop line would be equivalent, it is said, to two two-track lines or one four-track line from New Jersey to New York City, although it consists only of a two-track line up and down through Manhattan. Its carrying capacity is estimated in the report to be as follows:

Tracks	2
Trains per hour	70
Cars per hour	770
Passengers per hour	77,000
Daily passengers	192,500

This estimate is based on the operation of 35 trains per track per hour. Each train would be of eleven cars and would carry 100 passengers per car. The daily

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passengers is based on a rush-hour load ratio of 40 per cent of the daily one-way traffic being carried in the maximum hour.

Methods of Financing

There are three ways in which a transit project may be financed, the report states. Private capital may be called upon either to assist in the financing or to provide all of the money necessary. State, city or community credit may be utilized by issuing bonds. A benefit assessment plan may be used to raise the money under which each beneficiary, the rider, the taxpayer, the land owner and the steam railroad traversed may pay a share of the cost of the line and the service on it proportional to the benefit that each receives. These financial plans may be used separately or in combination with each other.

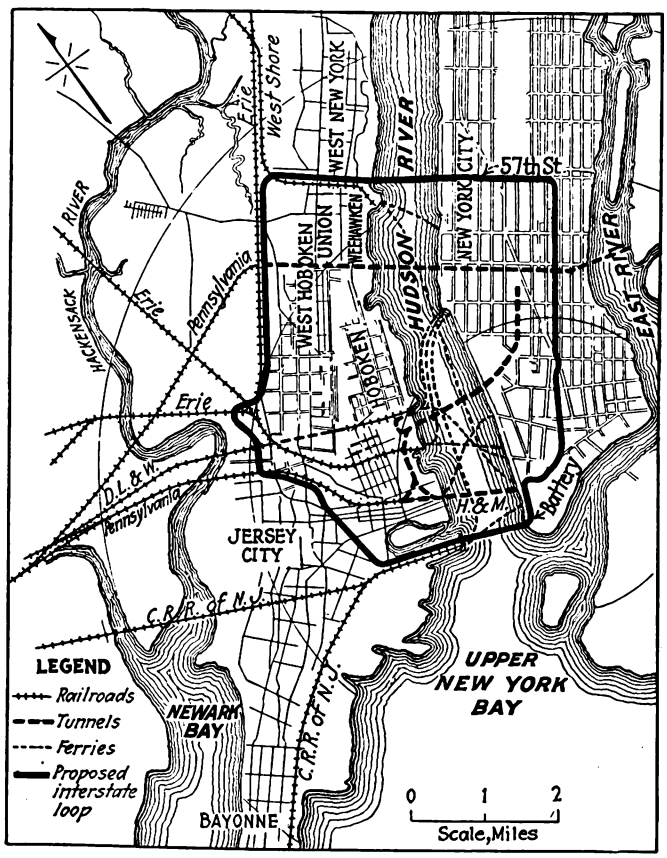
According to the commission a 10-cent fare will be possible on the interstate loop if the interest and sinking fund charges on the construction costs can be eliminated. However, if these interest and sinking fund charges must be included, or in other words, if all of the money must be borrowed and therefore the most costly method of financing must be adopted, then a 15-cent fare will be required. It is considered that the quantity of service provided would permit a comfortable rush-hour travel without excessive overloading. Seating capacity per car is assumed to be 72 and the average rush-hour load 100 passengers. This means on the average only 28 standees per car or a 40 per cent overload.

Battery Line as First Relief

It is recognized that as a temporary expedient and as an emergency measure it may be necessary to start with a project requiring an even smaller expenditure than the $154,000,000 required to construct the interstate loop line. In such an event the report states that the only recourse is to utilize some of the existing rapid transit facilities and to extend them somewhat. Construction of the proposed new Battery tunnel and the continuation of the line in New Jersey to and including the Meadows transfer station, constituting the southern part of the proposed interstate loop, will afford the easiest, cheapest and most effective means of securing immediate relief for northern New Jersey, the report states. Such a line might be operated either by the Interborough Rapid Transit Company, or the Hudson & Manhattan Railroad. If the Interborough becomes the operator the local tracks of the east and west side subways will be connected with the line at the Battery as a temporary measure, the west side subway by a short connection from Morris and Greenwich Streets, the East Side Subway by continuing the construction of the interstate loop line as far as Vesey Street, and further connecting it with the subway at Spruce Street. If the Hudson & Manhattan becomes the operator the Battery line will be continued as a part of the interstate loop to the first station in Manhattan at Morris Street, and there stop temporarily. The cost of the Battery line exclusive of power facilities would be $73,500,000.

Besides possibly using the Battery line section of the interstate loop as a temporary transit measure, at some time in the future the Hudson & Manhattan System can be extended in New Jersey to advantage. Two such extensions are recommended. One is in Hoboken from the Lackawanna Station along Washington Street to Fourteenth Street, a distance of 1.3 route-miles, and the second is in Newark from the proposed Pennsylvania Railroad Market Street Station out Clinton and Springfield Avenues to Springfield, a distance of 8.1 miles. This is a total of 9.4 route-miles and the cost is approximated at $75,000,000, including equipment.

Similarly the Interborough Rapid Transit Company in time may have extensions constructed under the Hudson River to New Jersey. Three such possible extensions are outlined: First, the east side subway from Spruce Street via Vesey and Washington Streets to a tunnel at the Battery, a distance of 1 mile; second, the west side subway from Morris Street via Greenwich Street to the Battery and thence with the east side subway extension under the Hudson River along the Central of New Jersey right-of-way under the Boule-



Construction of an Interstate Loop Line Connecting All the North Jersey Commuters' Railroads with Manhattan Is Recommended by the Commission. Battery Section to Be Built First

vard, Tonnelle Avenue through Meadows transfer under Manhattan, Central, Bergenline and Anderson Avenues to Cliffside Park, a distance of 15.0 route-miles; third, the Queensboro subway from 41st Street and Eighth Avenue under 41st Street, the Hudson River and Franklin Street to connect with the Bergenline Avenue line, a distance of 2.5 route-miles. These extensions are all for two tracks and are roughly estimated to cost $150,000,000 for construction and equipment. At the Battery these extensions would require their own tunnels so the operation could be entirely independent of the interstate loop.

The Brooklyn-Manhattan Transit Corporation Fourteenth Street line now terminating at Sixth Avenue in Manhattan could be extended under the Hudson River, Seventh Street, Hoboken, and South Street, Jersey City, to the Meadow transfer station, thus affording New Jersey commuters access to Manhattan at Fourteenth Street and thence across Manhattan into Brooklyn with

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convenient transfer by means of the B.-M. T. lines to almost anywhere in Brooklyn.

Later on additional lines may be added to the north Jersey rapid transit system, thereby extending the advantage of rapid transit to a larger part of the inner ring area. Ultimately an electric suburban system for the commuters from the outer ring area may be inaugurated by electrifying the existing railroad facilities traversing the area, and thus furnishing a through service into and through Manhattan eventually for all commuters in New Jersey.

During the past year the work of the commission has dealt largely with the engineering features of the proposed plan. Co-operation was received from the Transit Commission and Board of Transportation of New York City, the Public Service Commission, the Westchester Transit Commission, the Port of New York Authority, the Regional Plan of New York and the various railroads.

In submitting its report to the Legislature the commission expresses the belief that the scope of its work is most clearly set forth by simply transmitting the report of Daniel L. Turner, its consulting engineer, and Charles N. Green, its chief engineer. An indorsement of the proposed plan by Col. William J. Wilgus is included at the end of the report.

Extent of Electric Railway Replacement by Buses

Survey Shows Transportation Service Now Being Rendered by Motor Vehicles on Approximately 2,000 Miles of Route Where Economic Factors Forced Suspension of Rail Operation

COINCIDENT with the development of the bus as an influential factor in city and intercity transportation, a considerable abandonment of electric railway trackage has occurred. A careful survey of the situation made by *Bus Transportation*, however, shows that economic factors, rather than bus competition, were the principal causes of these abandonments. The widespread use of the private automobile was a major factor. Rising costs of labor and materials without commensurate increases in revenue were additional factors. Although the bus was not the cause of the railway abandonments, its service has replaced car service on approximately 80 per cent of the route mileage.

Because the present bus routes do not in all cases follow exactly the same streets as the former car lines, it is impossible to determine accurately the mileage where service by bus has replaced service by car. In numerous instances a new bus route has been extended beyond the former rail heads to tap newly developed territory. On the other hand, in some localities where the railway track had already been extended into thinly populated and unprofitable territory the bus service has been established along only a part of the former route.

Replacements of rail service by bus service may be classified under three general heads:

(a) Abandonment in part of the trackage of an electric railway and the substitution of buses by the same or a subsidiary company.

(b) Abandonment of an entire electric railway system and the operation of buses by the same or a subsidiary company.

SUMMARY OF REPLACEMENT OF ELECTRIC RAILWAYS BY BUSES

	Number of Companies	Approximate Miles of Track
Substitution of buses for part of rail system	79	725
Substitution of buses for entire rail system with service now rendered by same company	30	395
Substitution of buses for entire rail system with service now rendered by separate company	67	880
Track abandoned and no service now rendered	54	500
Total	230	2,500

(c) Complete rail service abandonment and substitution of bus service rendered by some outside agency.

Among these classifications the first includes the largest number of companies. The survey shows that within the last ten years some 79 electric railways have suspended car service on certain lines totaling approximately 725 miles of track and now operate buses to serve the districts formerly served by the cars. It is interesting to note, however, that this represents only a comparatively small part of the total bus route mileage now operated by the electric railways. The remainder, over 12,000 miles of route, represents new service or service supplementing that rendered by the cars.

Reasons why rail routes or parts of rail routes have been abandoned and bus service commenced are numerous. Probably the most usual cause of a replacement of this kind is to save the expense of rebuilding track which has become worn out. Greater flexibility of bus operation as compared with car operation on single track lines is another reason. The possibility of slightly modifying the route by the substitution of buses for cars and thereby providing a more convenient service has been a factor in other specific cases.

Under the second classification are some 30 former electric railways which have abandoned all rail service on 395 miles of track and now operate buses exclusively. The mileage of the present bus routes totals slightly more than the former car routes, or a little over 400 miles. In general, the reasons why an entire railway system has been supplanted by buses are the same as those given in the preceding paragraph for the replacement of individual routes or parts of systems by buses.

Under the third classification the survey shows that during the past ten years 67 electric railways have abondoned all car operation on approximately 880 miles of track, and that traffic formerly dependent on the cars is now handled by buses operated by newly formed organizations. In some cases under this classification the operating personnel for the present buses has been largely drawn from the former electric railway personnel, although the company no longer has any corporate existence.

RECENT TREND TO RAILWAY BUS OPERATION

Comparison of the list of electric railways which have entirely replaced their car service with bus service with the list of those whose service has been replaced completely by bus service rendered by others sheds an interesting light on the development of the bus. The survey shows that there are somewhat more companies having been superseded by separate organizations than there are companies having themselves gone over to all-bus operation. It is noteworthy, however, that in the main the replacements by outside companies occurred during the early part of the decade just ended,

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and that the tendency recently has been for the same company to continue to render the service, changing only the type of vehicle. In this situation is reflected the changing attitude of the electric railway industry toward the bus. Transportation men who a few years ago could see little merit in this type of vehicle have now come to regard it as a valuable facility.

In addition to the electric railway mileage on which car service has been replaced by bus service either by the same or a different agency, 54 small electric railways have completely suspended operation and no substitute transportation service of any kind is now provided. The total trackage involved, however, is less than 500 miles, or an average of about 9 miles of single track per company. These were, in the main, the so-called marginal companies which were built in sparsely settled territory and where the expected traffic failed to develop in sufficient volume to support their operation. The small average mileage per company well illustrates their unpromising character. Had their prospects been brighter they would undoubtedly have been merged with other companies to form larger and more stable systems. As it was, they were left to sink or swim, and were finally forced under by the economic pressure resulting from the war and the post-war readjustment.

Thus it will be seen that during the last ten years approximately 2,500 miles of electric railway track has been abandoned and that bus service is now supplied on about 2,000 miles, or 80 per cent of the total. Whether or not the substitute bus is providing service as acceptable as that formerly provided by the trolley is beyond the scope of this survey. To determine it would require comparison of frequency of service, rates of fare, riding comfort of equipment, adequacy of return on capital invested, etc. These factors it would be manifestly impossible to determine accurately for such a large number of situations spread all over the country.

Particular interest attaches to the cause of railway suspension. Contrary to a somewhat general impression, the bus had been responsible for the abandonment of comparatively little electric railway trackage. In many instances the survey showed that a considerable period of time elapsed between the suspension of rail service and the inception of bus service. Thus it appears that the bus was brought in to fill a transportation need created by the railway suspension and was not itself the cause of that suspension. In cases where the railways themselves undertook bus operation along routes formerly served by their cars, there was no gap between the ending of one service and the beginning of another. In the great majority of these cases, too, economic factors were the reason for replacement.

U. S. Pays Railways $619,200

DURING the last fiscal year the Post Office Department paid $619,201 to electric railways for the transportation of mail. The postal revenues accruing from the mails handled on electric railways aggregated $499,591,478. During the current fiscal year it is estimated that mail carrying $660,000,000 in postage will be transported by electric railways, for which service the government will pay $715,913, or $1,085 for each million dollars of the postal revenue.

During the next fiscal year the amount will have increased, it is estimated, to $702,900,000 (revenue basis). The electric lines will receive $725,000 for the service performed.

Fare Reduction Increases Revenue

BY J. O. HORTON
West Penn Railways

BECAUSE of decreasing revenue it was necessary recently to take steps toward lowering expenses without lowering standard of service of one of the operating divisions of the West Penn Railways, joining the towns of Kittanning and Ford City. This line is 9.4 miles in length, serving an industrial and mining territory with a population of approximately 17,500. It is paralleled by a good hard-surface road, permitting unlimited competition from the private automobile, although there is no competing bus service. The only way available was to go to one-man operation. Service at that time was given by three two-man cars on a 30-minute headway, except that one terminal zone had only two trips in the morning and five in the afternoon.

Analysis of the rates prevailing indicated that one-man operation would be difficult with the diversity of fares. There were five zones, complicated by overlaps. There were six types of tickets, ranging from 5 cents (nine for 50 cents) for single zones to 14 cents (ten for $1.40) for special three-zone combination. The cash fare was 6 cents and school tickets three cents per zone. Two-thirds of the revenue came from cash fares, involving much change-making. The ticket sale amounted to less than one-third of the revenue.

In view of the economy expected it was decided to revise the rates of fare and a liberal concession was made to regular riders. All previous adult fares were abolished in favor of a cash fare of 8 cents instead of 6 cents per zone, standard ticket fare of 6¼ (four for 25 cents) per zone and three weekly passes. The passes practically eliminate zone boundaries, inasmuch as one pass at $1 covers above half the route, a second pass at $1 covers the other half, while a third pass at $1.50 covers the entire line, over which the original cash fare per trip was 30 cents and at present is 40 cents.

With simplification of fares, the classification register was replaced by a locked fare box. The following figures show that a loss of 4.61 per cent was changed to a gain of 9.52 per cent, an algebraic improvement of 14.13 per cent:

	Per Cent
First ten weeks, Sept. 20 to Nov. 29, of new fares, average weekly revenue compared with eight preceding weeks, increased	9.52
Similar comparison for corresponding period of 1924 shows a decrease of	4.61

Change in fares had an interesting effect on the ratio of revenue from different classes of riders, as follows:

	Old Fares	New Fares		
	July 27 to Sept. 20, Per Cent	Week Ended Sept. 27, Per Cent	Week Ended Nov. 29, Per Cent	Eight Weeks Average, Per Cent
Cash	69.1	19.6	8.6	11.3
Ticket	29.7	50.9	62.5	60.1
Passes	....	29.2	28.2	28.1

Saving in platform expense for seven weeks of one-man operation from Sept. 21 to Nov. 8 as compared with preceding ten weeks of two-man operation amounted to 42.5 per cent.

An additional car was placed in service on Nov. 9. This change gave extra service to the end of the line, a car each hour between 7 a.m. and 10 p.m., instead of tripper service morning and evening. The extra car decreased saving in platform expense, but for three weeks ended Nov. 29 a saving of 35.2 per cent was shown.

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Association News & Discussions

Optimism Characterizes C. E. R. A. Midwinter Meeting

Many Speakers at Two-Day Session on a Variety of Topics Carry the Same Theme—Predictions for the Future Are Based on Accomplishments of Past Five Years

ENTHUSIASM to a greater extent than has been observed in any recent convention marked the two-day midwinter meeting of the Central Electric Railway Association held in Indianapolis on Jan. 28 and 29. More than 400 attended the sessions, and the estimates made by the dinner committee were exceeded by about 100 guests, a total of 264 being served at the Indianapolis Athletic Club.

President Frank R. Coates sounded the keynote in his presidential address. Progress made by the electric railway industry in the past five years, he said, is almost unbelievable. Recommendations of the Federal Electric Railways Commission have been carried out and the industry is now firmly on its feet and moving ahead. Mr. Coates' address and the other papers and formal discussions are published elsewhere in this issue.

The same theme was expanded and many illustrations were cited in a paper by Britton I. Budd, president Chicago Rapid Transit Company. In the absence of Mr. Budd it was read by C. E. Thompson. At its conclusion President Coates voiced the sentiment of the meeting in expressing sincere thanks to Mr. Budd.

R. H. Pinkley, assistant general manager the Milwaukee Electric Railway & Light Company, followed with a paper on the economic trends of electric railway and bus service, illustrating with the experiences of his own company.

Discussing Mr. Pinkley's paper, A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company, said that electric railways must get into interurban bus operation. In general the managements have not been able to see the reasons for the falling off of the interurban railway business and the growth of the bus traffic. However, it will be necessary to use a new type of salesmanship to make the most of bus service. This matter of selling is of prime importance, in order to get automobile owners to leave their cars at home and ride the buses.

The use of special buses on tours presents a great chance for developing business, said Mr. Blinn. In fact, it may be one of the most profitable phases of the service. The equipment cannot be too good. In the past managements have been pennywise and pound foolish, he said. Cars appear to be preferred by passengers in the winter and buses in the summer, according to the experience on the Northern Ohio property. The fares on both classes of service should be worked out in such a manner that each will have a chance to render service and return a profit.

Continuing the discussion, R. N. Graham, manager of railways Pennsylvania-Ohio Electric Company, Youngstown, Ohio, gave an outline of experiences and practices on his property. There is no rubber urge as such, he said. It is superior service that gets the results.

R. R. Smith, vice-president and general manager Chicago, South Bend & Northern Indiana Railway, made the point that the real menace to the electric railway is not the bus but the private automobile.

Car Modernization Urged

Cars should be replaced as soon as new ones show a greater return financially than old ones, said Charles Gordon, assistant vice-president McGraw-Hill Company, in a paper on the economics of modern cars.

Concrete results of car modernization were given in a paper by L. J. DeLamarter, vice-president and general manager Grand Rapids Railway, which was read by Major H. C. Havens of the same company.

J. N. Shannahan, past-president of the A. E. R. A., in a few well-chosen remarks, stated that the industry is taking on a new life. He has observed that a more vital interest is being shown. This is due to a renaissance, he feels, which will have far-reaching results of great benefit to the electric railways.

The progress of the Central Electric Railway Master Mechanics' Association since its organization a year ago was outlined by its president, T. H. Nicholl, superintendent of motive power Union Traction Company of Indiana. In the central territory the railways started as independent lines with little in common. Their expansion has brought them closer together and has resulted in many problems connected with interchange of equipment. Freight service in particular has been handicapped. Organization of the Master Mechanics' Association was effected as a means of getting harmony between the various roads involved in this section. The group is small enough to handle any problem in a quick and effective manner. Its meetings consist of a general discussion and reports of committees, followed by a trip through the shops of the local company where the meeting is held. One accomplishment has been to put in shape the interchange rules passed down from the old Engineering Council of the C. E. R. A. This took a great deal of time. Another piece of work which is ready for adoption, which will be a second forward step, is a uniform schedule of charges for work done on equipment of other roads in the association. Still another accomplishment is the design of a standard box car. A discussion of this design appears in another part of this paper.

Foreman Conference Demonstrated

The work of a group conference, as practiced on the Boston Elevated Railway, was demonstrated by H. H. Norris, educational adviser of that company, with sixteen foremen, three of whom came from Boston, while the remainder were from the Indianapolis Street Railway and the Terre Haute, Indianapolis & Eastern Railway. This demonstration was given to show, for the benefit of the C. E. R. A. and the management and operation and education committees of the A. E. R. A., what can be accomplished by a group of foremen discussing problems which arise in their daily work. The demonstration, which was a condensation of a standard foremen's conference, showed a great deal of interest on the part of the men and the possibility of giving them a new appreciation of the duties and responsibilities of their positions.

Unusual in attendance and in the character of the talks, the dinner continued the theme of the meeting. The principal address, by Managing Director Lucius S. Storrs of the A. E. R. A., is published elsewhere in this issue. In a way which appealed to his listeners Mr. Storrs pointed out some of the dangers which can and have been overcome, and showed ways of analyzing the effectiveness of public relations work.

E. F. Wickwire had arranged to give the same address he had presented at the New York Electric Railway Association dinner the night before, but after making a desperate effort to be present, was unable to reach Indianapolis. His address was read by Labert St. Clair. An abstract will be found in this paper, issue of Jan. 30.

At Friday's session the same theme of optimism was carried forward by T. A. Kenney, vice-president Northern Ohio Traction & Light Company. Accomplishment rather than hopes marks the status of the electric railway industry today. When operators meet now they tell how things have been done, and how they have increased business both on rail and on bus lines. This testimony will be helpful, he said. The way to get more business, whether on rails or on co-ordinated systems, is to give service.

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In order to get back the traffic lost by the rails to competitors a few years ago real service is needed. In the past these competitors have been able to offer a better service, although their operation was unfair in many respects. Undoubtedly the time is not far off when all forms of transportation will come to regulation on the same terms.

Mr. Kenney is a thorough believer in co-ordinated rail and bus systems and rail and motor truck systems. The advisability of considering door-to-door delivery should be considered. This service in competitive form took considerable business away from the interurbans. To provide similar service will get back a large share of the business that has been lost and will develop still more.

The central territory, largely because of its geographical location, has more than its share of competition. Not all the extensions of electric railways made twenty years ago were wise. The same holds true of some of the bus and truck lines now, he said. The men of the Middle West have had more vision than those in other parts of the country. Here is where the great automobile factories are located. There is more freight development in this territory than in any other. This business has been made profitable in many cases. Its growth has been remarakable. One company with a relatively small investment has developed a gross business of $750,000 for 1925, with a good net revenue remaining.

He cannot advise too strongly in favor of going after the freight. Electric railways can deliver much more quickly than can the steam roads or the truck lines. However, there must first be an organization to solicit the business, and there must be adequate facilities, including terminals, to handle it.

The railway man is a much better business man than he was 25 years ago. He has become able to analyze costs. The executive has helped himself by these studies, and has shown the value of the rail lines. He also has been helped by the A.E.R.A. and its executives, particularly the Advisory Council and Managing Director Storrs. In conclusion, he said the electric railway has been shown to be an economic necessity. It is over the hill and is coming back in fine shape.

The place of the woman in the public utility business was considered in a paper by Miss Helen E. Steiner, director of public relations Ohio Public Service Company, Lorain, Ohio, who indicated many places which give opportunities where women can serve better than men.

Officers Elected

C. L. Henry, receiver Indianapolis & Cincinnati Traction Company, stated that the constitution of the C. E. R.A. fixes the executive committee at twelve members. The limitations are such that only one new railway member can be added each year. The association voted to appoint a committee to consider a change in the constitution. The report of the nominating committee, which was accepted and the nominees declared elected, was as follows:

President, G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis.

First vice-president, M. Ackerman, general manager Lake Shore Electric Railway, Sandusky, Ohio.

Second vice-president, W. S. Rodger, general traffic manager Detroit United Railway, Detroit, Mich.

Secretary-treasurer, L. E. Earlywine, Indianapolis.

Executive committee: F. R. Coates, Toledo, Ohio; Harry Reid, Indianapolis, Ind.; J. P. Barnes, Louisville, Ky.; R. I. Todd, Indianapolis, Ind.; A. C. Blinn, Akron, Ohio; H. A. Nicholl, Anderson, Ind.; F. W. Coen, Sandusky, Ohio; J. F. Collins, Jackson, Mich.; G. R. Millican, Evansville, Ind.; John Benham, Chicago, Ill.; J. H. Drew, Mansfield, Ohio; J. P. Longon, Cincinnati, Ohio.

Following the election Mr. Jeffries was conducted to the platform and installed as president, after which the meeting adjourned.

The Industry Has Kept the Faith*

Recommendations of the Federal Electric Railways Commission Five Years Ago Have Been Followed and Wonderful Progress Has Been Made—The Public Has in the Main Done Its Part Also

By Frank R. Coates
President Central Electric Railway Association

DEPENDABILITY of promises usually can best be judged by the performance of past pledges. It is fair, then, in considering the electric railway industry's present pledge of good service to review its record of carrying out its promise, made to the federal government and car riders five years ago, to improve local transportation throughout the country. That promise has been kept, and, having kept it, the industry is entitled to the confidence of riders when it says it will go on providing the best possible local transportation, both by car and bus, in the future.

All of you doubtless will remember what caused the federal government to become interested in the future of electric railways. During the war they were called upon to function as a part of the government war machinery and they readily responded. An office was maintained in Washington throughout the war and every available facility of the industry was placed at the disposal of the government. Thus President Wilson learned first hand that the properties, owing to rapidly increasing wages and material costs, were in a bad way. At one time one-sixth of the mileage of the country was in receivership and it looked as if the rest of it might go in at any time. Many of the largest companies in the country were involved.

Realizing how necessary electric railways were to the welfare of the country, President Wilson appointed the Federal Electric Railways Commission to investigate the situation and make recommendations to help the industry get back on its feet. This commission consisted of representatives of the public, labor, financial institutions and electric railways. Hearings were held in New York and Washington for about a year and every phase of the electric railway business was gone into. Summarized, the commission found that the industry was without financial credit and was not performing its public function of furnishing good local transportation.

The primary causes of this condition were found to be economic. Contributing chief influences named were increased labor and material costs, early financial mismanagement of properties and failure of the uniform 5-cent fare.

To cure this situation these remedies were suggested:

Restoration of credit by removing public antagonism, enlisting public co-operation and assuring the investor a fair return on his investment.

Economy in operation, improved service and assurance of a fair return on a fair property value.

Elimination of special assessments for sprinkling, paving, construction and maintenance costs of bridges used as highways.

*Presidential address before the Central Electric Railway Association, midwinter meeting, Indianapolis, Ind., Jan. 28-29, 1926.

COMING MEETINGS OF *Electric Railway and Allied Associations*

Feb. 8-11—American Institute of Electrical Engineers, midwinter convention, 29 West 39th Street, New York, N. Y.

Feb. 11—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio, 9 a.m.

Feb. 18—A. S. C. E., A. S. M. E., A.I.E.E. and A.I.M.M.E., joint meeting, Engineering Societies Building, New York, N. Y., 8.15 p.m.

Feb. 24-26—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11—Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

March 12—Pennsylvania Street Railway Association, annual meeting, William Penn Hotel, Pittsburgh, Pa.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

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Strict regulation as public carriers of jitneys, motor buses and similar public motor conveyances.

Public control flexible enough to assure sufficient revenue to pay the entire cost of service, including both capital and labor costs.

Fair valuation of property and voluntary reduction of excessive capitalization to the basis of the property value.

Installation of the cost-of-service plan, experiments having proved that it results in a fair return upon capital, establishes credit and effects reasonably satisfactory public service.

Payment for extensions into new territory by property thus benefited.

Living wages, humane hours of labor and working conditions for employees; settlement of labor disputes voluntarily or by arbitration in a binding manner which will eliminate both strikes and lockouts.

The only thing that the transportation leaders asked was that the public do its part in bringing about the rehabilitation of service as suggested by the commission.

That was five years ago. Today, when you make a survey of the industry and see the progress it has made along lines laid down by the commission, the situation seems unbelievable. Without question electric railways have kept faith with the government, and the public, in the main, also has done its part.

To summarize briefly, today virtually every large property in the industry either is out of receivership or on the verge of emerging from it. Included in properties in receivership are those of Kansas City, St. Louis and Denver, all of which may come out at any time. Then there will be very few large properties in the United States under the direction of the courts.

More than 16,000,000,000 persons are being carried annually by the properties. This is particularly significant when it is taken into consideration that there are probably 17,000,000 pleasure automobiles in this country, in addition to a very large number of buses.

Cars and Buses Go Together

One of the outstanding problems of recent years, the co-ordination of car and bus service, is being solved rapidly. Today more than 5,000 buses are being operated by some 275 electric railway companies in co-ordination with their car service, and the tendency to run both buses and cars under single managements is decidedly on the increase.

Those are the high points as revealed by a quick survey. Let us now consider specifically how the industry has carried out the suggested remedies of the commission.

The initial recommendation of the commission that public antagonism be removed and credit thus restored has received the chief attention of managements. The commission's investigation showed plainly that the best way to get riders behind managements was to clean house, have a good story to tell and then tell it as often as possible. The industry as a whole has done just this thing. Financial reorganization has taken place on a wide scale, and with houses clean, managements have invited the public in to see that not only do things appear well on the surface, but that no dirt was swept under the beds. More than 300 companies, embracing a very large majority of the mileage of the country, today are doing intensive public relations work through paid advertising, publicity, public speaking and personal contact with customers.

Credit has not been fully restored, but it is decidedly on the mend. Whereas five years ago it was practically impossible to go into financial circles and effect a loan, this is not the situation today. More and more financial people are coming to realize, through learning true conditions in local transportation from managements themselves, that there is a very decided demand for electric railway service where progressive, honest, enthusiastic management is in charge of a property, and the public is fair; the securities of that property usually offer a safe investment. The credit of properties will continue to improve largely in proportion to the management's efforts to remove public antagonism by honest endeavors to give good service. And since the majority of managements are making this effort, the outlook for steadily improved credit conditions is good.

Great forward strides have been made in effecting economies in operation. The necessity for making every dollar count has spurred operators on to the exercise of great care of expenditures. The result has been that properties today are being operated more efficiently and economically than they ever have been in the past. With this economical operation has come improved service. Managements everywhere realize that the best service results from running cars only where there is a demand for them that will pay a reasonable return. As a result many branch lines, which probably never should have been built, have been eliminated from service in recent years. In some cases buses have supplanted these lines, and in this service the bus has proved very helpful. Doubtless it is in such supplemental work that the bus eventually will find its most important field.

A good start has been made by the public in eliminating special assessments, particularly for paving, and much more should be done along this line. Complete or partial relief from paving burdens has been afforded companies in two states and about 50 cities. It must be said frankly that one reason why this relief has not been more general is that electric railway managements themselves have not properly presented their story to the public. It is a rare community indeed which, when it is told the whole story of electric railway tax burdens, will not indorse some sort of relief. If the industry will carry on this campaign for tax relief properly, good results doubtless will be obtained. It cannot, however, expect the public to rise up voluntarily and begin to lop off taxes.

Regulation of jitneys, motor buses and similar public conveyances, recommended by the commission, has been widespread, but much more must be done, particularly in a national way, with this situation. Since the commission made its report various legislative bodies in some 38 states and the District of Columbia have regulated these vehicles as common carriers and required them to obtain certificates of convenience and necessity before operating. National legislation of a similar character now is pending in Congress. The Supreme Court recently held that no official body had any control over motor vehicles engaged in interstate commerce, and, as a result, the National Association of Railroad and Utilities Commissioners has had a bill introduced which seeks to put motor vehicles in the same regulated class as our steam and electric lines.

The readjustment of fares, so as to insure sufficient revenue to pay the entire cost of service, including both capital and labor costs, has received widespread and respectful attention by the public. The 5-cent fare, and, in fact, all fixed fares, have been practically wiped out. Today, with the exception of about a dozen communities, the principle of riders paying a fare of sufficient amount to meet all costs of operating a road is generally recognized. A later survey of the association shows that 83 cities have a 10-cent cash fare, three a 9-cent, 31 an 8, 67 a 7, 47 a 6, and only ten the original 5-cent fare.

Fares Governed by Length of Ride

The sum and substance of the whole fare situation is that if rides are short enough and costs are low enough they probably can be provided for 5 cents, or even less, but if rides are not short enough or costs low enough more than a nickel will be required. Fares respond to the same inexorable economic laws as any commodity.

In these days of public service commission valuation the cry of watered stock is a hollow one. Stories of such historic financial jugglery came up frequently in the commission hearings, and doubtless there was truth in the claims that there was some mismanagement in the early days. But nowadays fares are fixed on the value of the property, and hence so-called watered stock has nothing to do with them. Furthermore, commissions and managements themselves have pretty thoroughly drained all the water out of electric railway securities.

Service-at-cost plans have worked out well in some communities. The theory of service at cost, which is simply providing a fair ride for a fair return, is becoming universal.

The recommendation that property owners pay for extension lines into new territory has not been generally adopted, and this is due in part to the rapid development of the bus. Nowadays most companies are serving sparsely settled new territory with buses until such time as laying of rails is warranted. There have been some cases where communities have paid for laying rails.

Electric railway labor today is receiving the highest wage in the history of the industry, except for a short time in 1921. The most recent report shows that 85 companies, operating more than 100 miles of track each, are paying an average of 56¾ cents an hour to their men. This is more than double the average wage that was being paid at the beginning of the European war. The average annual earnings per man in the industry is about $1,700. When regularity of employment is taken into consideration, the electric railway men's jobs are good ones indeed.

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The foregoing, in brief, is a summary of how the electric railway industry has kept its faith with the government and the public. Of still greater importance, the industry has kept this faith gladly. Its greatest desire is to continue successfully along the lines it has been following in the last five years, but to go forward to still greater achievement. It recognizes that carrying, as it does, four out of every five persons who ride any kind of a vehicle, it has a great duty to perform to the public. At the same time it recognizes that, representing an investment of almost $6,000,000,000, it has a similar duty to perform to some 1,300,000 investors. Its purpose, in a nutshell, is to render the best service possible at the lowest cost consistent with obtaining a fair return on the investment for its efforts.

Winning Public Good Will*

Many Methods Have Been Used in Grand Rapids to Obtain Public Recognition for the Railway and Overcome Long-Standing Indifferences and Prejudice

By L. J. DeLamarter
Vice-President and General Manager Grand Rapids Railway

GOOD will and good public relations are the fulcrum by which the street railway industry will elevate itself into greater community confidence and service, municipal co-operation and increased revenues, provided that at the same time the industry offers the improved degree of service the public now expects and demands through its usage of vehicles offered by automotive manufacturers.

The success of winning good will depends so much upon the intangible, indefinite "feeling" to do the right thing at the right time, to take full advantage of changing conditions promptly, to believe enthusiastically in your job. Admitting that during the past few years to believe enthusiastically in the average street car with the same color scheme, the same flat wheels, same old slat or cane seats, same clangy gongs, same old more or less dirty blue uniforms, same old dirty windows, same old advertising signs and same old hundred and one things that our fathers and some grandfathers looked at, one has to have some vision and be considered about ready for the asylum.

The history of the street rails in Grand Rapids during the past few years, we presume, is more or less similar to that in most cities. Using the history of the Grand Rapids property for the past few years as an example will, it is believed, bring out the points to be emphasized. Confronted with the necessity of a new franchise, of refinancing and asking for increased fares during the interim and other problems known to most general managers, all of these problems now being behind us, we believe is proof that our good-will methods, in a general way, have brought definite results, as the company now has a 30-year franchise, an 8 per cent allowed return, a 10-cent cash fare with six tokens for 50 cents. When our new service-at-cost 30-year franchise was submitted to the people, with no appeals for public favor, such as lower fares or extensions, it was approved by 72 per cent of the electors voting. Before the election the franchise was approved by all the local newspapers, by ten improvement associations, by nineteen civic bodies, by the four noon-day luncheon clubs, besides various other clubs and organizations, including the Trades and Labor Council.

In addition to the franchise we have refinanced our entire bonded indebtedness without recourse to capital reconstruction. The bankers gave much credit to and were influenced to a great extent in approving the refinancing because of the good will as evidenced by the attitude of the city authorities, the local newspapers and the public. In our judgment public good will was one of the biggest single factors entering into the refinancing. We also secured, previous to the passing of our franchise, several increases in fare without any decided opposition.

In winning good will the three main factors, we believe, are: (1) Relations with newspapers; (2) relations with city authorities; (3) relations with the public, car riders.

In relations with newspapers the prudent manager will always keep his mind open and alert to cultivate the friendship and confidence not only of the owner or editor but of reporters and the desk men. Meet the newspaper reporter as a friend, make the effort to see him in his office if possible, and always in your office if he calls, for it is he who writes the articles that help mold good will for your company. If he is not your friend, the artful newspaper reporter can subtly inject into his articles a sting that hurts, or, being friendly, he will unconsciously reflect in his articles an intangible good fellowship that helps create popular favor for the railway company. Encourage friendship of or acquaintance with the desk men, the copy readers and others on the newspaper staff who, in some way, may some time handle the news pertaining to your company. They play a vital part in your good will program because they edit or headline the news matter, and into the "heads" they write they can also reflect the good will they unconsciously feel for your company if they are on friendly terms with you.

The local manager who feels above accepting advice from a newspaper man, who is in touch with the public and its affairs, is losing a trick. My experience over years with dealing with newspaper boys is that whenever one has something he doesn't want printed, by coming "clean" and explaining why it shouldn't be printed, 99 per cent of the boys will not betray confidence. On the other hand, if they get a news "tip" and you try to evade it, they will dig up the facts and print them and you have forever lost good will and confidence, for which you will have to pay eventually. The same rule applies to city authorities.

How well our policy serves in creating and sustaining public good will is reflected, quite forcefully, in the fact that not one adverse editorial or so-called "Letters from the People" article has appeared in the local newspapers during the past three years. The company's program has been constructively supported.

We have been fortunate in receiving unsolicited editorial support that has a far-reaching effect in helping the public have a better understanding of the street railway's problems. An example of this editorial co-operation, taken from the Grand Rapids *Press*, issue of Aug. 10, 1925, reads:

> Since the days of the horse cars there has never been a defensible reason for requiring the street car company to pave between the tracks, except the obvious one that the company has to do it to get the franchise and the city wants the money. The street cars do not touch the pavement and the wear upon concrete or brick between the tracks is from precisely the same vehicles as run over other streets. The ingenious claim that street car line paving, due to vibration of the tracks, will not last as long as paving elsewhere, seems to have been developed to bolster an obsolete and unjust tax against the street car company.

Illustrations of the thought given to crystallizing sentiment in favor of a public utility:

In the Grand Rapids theaters no criticism or ridicule of the street railway's cars, service or its interests is used by actors. This is because of the selling to local theater managers the idea that they should help the local railway and have the actor cut out anything adverse to its interests. Civic contact to further good will is gained by the officers of the company, like those in other cities, belonging to the leading clubs and organizations.

Talks are broadcast regularly from the local station by our safety engineer, known to the radio fans as "Uncle Bob." He gives a general safety talk and quietly injects interesting suggestions regarding the railway company. This broadcasting has secured splendid good-will results.

Our advertising, always optimistic, appears in many forms, newspaper ads, car posters, folders, pamphlets, theater slides, motion pictures, construction signs, and others. *Trolley Topics*, a monthly publication for car riders, has 36,000 circulation and is being increased to 50,000. An interesting good-will phase of this work was the conducting of a referendum on the three new trial coaches by ballots in *Trolley Topics*.

Novelty advertising, such as our "Don't Worry" campaign, not only caused much favorable comment but impressed the message that the "street car is the safest place in the city." It proved beneficial.

We occasionally employ a refined woman to criticise, from her viewpoint, what is displeasing to the car riders. Her reports have been far reaching in results because they have

*Abstract of a paper presented before the Central Electric Railway Association, Indianapolis, Ind., Jan. 28-29, 1926.

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taught us good housekeeping methods for our cars. We believe that managers should make a real, studied effort to anticipate criticism of service.

Don't forget to keep on your Christmas list the man who has done favors for you but can't any more. Aim to do thoughtful things when you have no ax to grind. Don't forget to write a longhand note promptly to your friend, with an expression of appreciation. Don't dictate it. Cultivate the crossing policemen. Don't merely send them cigars at Christmas time, but occasionally write a personal note, or an appreciative word to their chief.

The city authorities, with their political futures at stake and the old "fight the corporation" in their blood, offers serious consideration. The first step toward the goal is to sell the idea that the street railway business is a legitimate one and not illegitimate. Then by systematically visiting city officials at their offices for frank discussion of your problems, asking for advice, giving thoughtful consideration to their side of all questions, the majority of public officials, properly approached, will meet you part way at least.

Again, it is our belief that city authorities may be "sold" any proposition better by local manager, attorney or engineer than by outsiders.

During our recent car test in Grand Rapids we have proved beyond any doubt that cheery, comfortable cars, courteous and neatly uniformed operators, giving rapid service commensurate with safety, not only have created and established a greater good will through public relations but have tended to shatter the false belief held by many people that the gasoline-propelled vehicle is spelling the doom of the electric street car.

Because attractiveness and comfort are two of the surest methods of regaining lost patronage, keeping old customers and winning the potential car rider, our three new electric rail coaches, aided by the remodeled Birney car, the "Ramona," and other newly painted cars, also prove that new and cheerful color combinations, newly devised comforts and the latest refinements are winning the people back to the street cars. This has been exemplified both by increased riding patronage and greater public interest and good will on the lines where the cars have been operated. Echoing back to the company come words of unsolicited praise or satisfaction from members of societies and clubs expressing their delight for the new cars and their many refinements and comforts. Many letters are also received complimenting the company for its progressive efforts. In fact, street cars are more talked about favorably in Grand Rapids than ever before.

The new electric rail coaches in Grand Rapids have exceeded our expectations. They are responsible for a great amount of the good will as shown; they are indelibly impressed on the minds of the people. I dare say that if any one in this audience has relatives in Grand Rapids and should write them regarding the new coaches a very general description of the "St. Louis," the "Minnesota" or "Ohio" would soon be received. They have created interest.

Other Means of Getting Good Will

Developing industrial riding, offering through trip cars to industrial districts, adopting motor bus equipment for two purposes, feeders to existing raliway lines and independent routes in new territory, operators' visits in uniform to the homes of patrons of their lines to sell the company's service; utilization of the corner drug store, a long-neglected asset, for the display of time-tables in neat standards on showcases and otherwise aiding in selling the service, are other features of the good-will policy of the company.

An outstanding feature by this company in promoting good will, as evidenced by results and by widespread interest, is the establishment of a Commercial Drivers' Club. Organized by our company's safety engineer, the club is made up of the drivers and operators of trucks and other commercial vehicles. Its membership is more than 2,200. It dominates the commercial traffic situation. Bi-weekly meetings are held in the railway company's assembly hall, in which the company's operators join. The delays, the accidents, the displeasure of patrons occasioned by the lack of co-operation between electric cars and vehicles on the street is a serious problem well known; the creation of this organization has to a great extent furnished the remedy. It has established a desirable contact between drivers and car operators and is eliminating the old blocking of tracks and frequent belligerency. It has been instrumental in helping popularize street car riding by speeding up running time and reducing collisions.

Not only to the city as a whole does the management endeavor to carry the gospel of greater service and public utility good will, but to the sectional business or community district located in various outlying districts. By paying small but important attention to these growing and enterprising localities and appealing to their pride and loyalty the railway management, it believes, is gradually building up a confidence and patronage that is limited only by the future growth of the city itself. For instance, the company named a newly painted and very attractive car the "Creston," after one thriving business section. That community quickly responded as these lines from the Creston *News* show:

> The Grand Rapids Railway got the jump on Santa Claus and last Saturday surprised the residents of Creston by putting into service on the Division-Plainfield line a very attractive street car that has been christened "Creston."
>
> Harmonious color combinations, glistening varnish surface, gold letters and installation of comfort-giving devices all combine to make the latest innovation of the street railway company's system and service in Creston in keeping with this rapidly growing and progressive part of the city. Creston residents are proud of this car and desire, through the Creston *News*, to thank the railway company for this fine favor. . .

An anticipated reaction came almost immediately from Burton Heights, another prosperous district at the opposite side of the city and at the other end of the same street car line that serves Creston. The editor of the Burton Heights *Record*, with true and loyal spirit for his equally thriving section, penned an editorial, under the caption, "Why Not a Street Car Christened Burton Heights? Of course Burton Heights merchants and residents received their car.

Then Madison Square, another busy district, acquired the new car name habit and through its community newspaper appealed for a car named after the Square. The request was granted. And just a few days ago another outcropping of regional pride for and interest in brightly painted street cars was chronicled. The residents of Fairmount Park asked the railway company to do them the honor of naming a car after that community. This good-will opportunity was quickly grasped by the railway management.

In furthering this community interest, we have inaugurated another name plan that probably will be far reaching in good will and financial profit because it extends to hundreds of homes where ancestral pride, fond memories and the cherished records of public accomplishments are recognized by the railway company and friendly reaction is and has been created.

Names of worthy early settlers, pioneers and prominent citizens whose public records and business achievements have written their names indelibly into the history of Grand Rapids are being used. Until recently this would have been impossible because no family would have found pride and satisfaction in having its name or that of its ancestor emblazoned on one of the old, rattling dreary cars. They would have procured an injunction to prevent it. Now people asking for it and submitting names. The management is receiving much whole-hearted co-operation in the new names-for-cars scheme as a substitute for the old numbering system.

Today the pleasing color combinations on the three trial coaches have caused so much favorable public reaction that tests have proved the people will wait for and ride in these new cars in preference to the older types. Cultivating good will in another direction is the illuminated dash and pennant design. By using the pennant colors of local schools, both public and parochial, universities and colleges, attention of the students and alumni is attracted, then pride for their alma mater makes them friendly to the car company for displaying their favorite colors. Carrying the plan still farther, the Grand Rapids management abolished the cold-blooded number system for its operators, substituting neat and attractive name plates that are displayed in the cars; this in addition to the neat chauffeur uniform adopted early last year.

Summed up, the Grand Rapids Railway is:

Endeavoring to capitalize on harmonious color combinations to eliminate red from its ledgers and change its bank accounts from silver to gold.

Educating its employees that a request, prefaced with "please" and spoken with a smile, proves the best

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broadcasting code to tune in on the public.

Abolishing the word "can't" from its service lexicon.

Proving that good public relations is the father of good will, and that service is the mother of efficiency.

Teaching its operators that a shave today is worth two tomorrow.

That a motorman is best known to his patrons by the back of his clean collar.

That "safety first" is the greatest agent the adjustment department has as a dividend saver.

That every happy, satisfied patron can be made a good singer—of the praises of the street railway company. Solos are best heard and appreciated.

A rider's smile for an employee's kindness sometimes stretches to the promotion department.

Visualizing the industry and its conditions, I firmly believe that the pendulum of public opinion has started to swing back from the privately owned auto to the electrically operated rail coach. Our industry was doomed to pass through this evolution period. Nothing that we might have offered in the way of a vehicle, even a gold plated one, could have saved us from this cataclysm. It had to be. Now many of the American public, for various reasons, seem to have had their fling with motor luxury and are ready to return to the street car. The psychological moment is here. The trend proves that. But we must be prepared to aid that return, to hasten that moment, by offering the public a more attractive electrically operated rail coach that represents the utmost in comfort, than we have for years past. This adds to the continued studied effort for good will.

The days of miracles in public service have passed. Our books, records, methods and procedure must be open to all. Being a legitimate business we should have nothing to hide, nothing to obscure. Many companies are passing through financial crises. To survive, to be of the fullest service, they must be rehabilitated both morally and physically.

By morally I mean that there must come between street car users and street car companies a closer and more helpful relation.

By physically I mean that street car properties must be thoroughly modernized. We have passed through a severe period of destruction. That which has been torn down must be rebuilt. To rebuild requires money, courage and patience. We are facing forward. Aided by the combination of cordial public relations and modernized equipment the industry in which we are all so vitally interested will progress and prosper.

Economic Trend of Interurban and Bus Services*

While It Is Hardly Possible that Much Interurban Construction Will Take Place in the Next Few Years, the Interurbans Will Use the Bus to Amplify Service

By R. H. PINKLEY
Assistant General Manager
Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

WHEN work is plentiful and wages are reasonably high the American public is not generally guided by considerations of efficiency and economy in choosing its means of transportation, especially when one of these means possesses the element of novelty. More adverse times tend to force conclusions along more logical economic lines. Therefore it is difficult to analyze economic trends of services which have not yet fully yielded to the pressure of economic laws.

The present era of prosperity, which has provided a private automobile for almost every American family, has greatly stimulated the desire for travel; it has also increased the demand for transportation facilities to such an extent that most electric railways have been able to hold their business in the face of growing competition. Each locality has its peculiarities, and to determine adequately the general trends of public travel would require collecting and summarizing a large mass of data, the results of which would not apply to the average situation. This discussion will, therefore, be confined to developments in the State of Wisconsin which have come under the writer's observation, and particularly the experience of the Milwaukee Electric Railway & Light Company.

An example of foresight was exhibited in the case of the Chicago, North Shore & Milwaukee Railroad, which was originally built on a straight right-of-way with flat grades, except in one location where village streets were used and where a new cut-off has recently been completed. The Milwaukee Electric Railway & Light Company is now engaged in projecting extensive cut-offs on two of its interurban lines, which, in addition to furnishing rapid transit to local districts, will serve to shorten interurban routes and to remove the traffic from public highways. These are instances of trends of development which should give the interurbans advantages over possible competitors.

The development of bus operation has effectually checked expansion of interurban railways for the past few years, and it is quite certain that, except in rare and special instances, no new interurban railways or extensions to existing lines will be built for a number of years to come, or until the distribution of traffic between these railways and competing buses has been definitely determined. There has been and will continue to be a marked reduction in non-essential interurban operation.

As the automobile becomes more generally used streets and their intercity highways rapidly developed. The jitney competition reached a climax in 1914-15, utterly failing in its purpose, though encouraged by early legislation, or lack of legislation, and propaganda. The jitney gave way to some extent to the city bus; then the intercity bus became a menace to the interurbans. Although unable to replace the latter, the electric rail service nevertheless suffered great harm.

In order to co-ordinate the various branches of its service, the Milwaukee Electric Railway & Light Company found it expedient to extend its bus service in other directions where business warranted, over the excellent paved highways radiating out of Milwaukee, without regard to the location of its existing interurban railways. It now operates 56 buses in interurban service, serving a territory having a radius of about 100 miles, with Milwaukee as its center, and covering 805 miles of interurban routes. The company also operates 36 buses in strictly city service and 32 buses in conjunction with street car lines.

The total gross receipts of the Milwaukee Electric Railway & Light Company for all bus operation in 1925 was well over $1,000,000, showing a substantial increase over receipts for the year 1924.

At the time of this writing the company is encountering no bus competition. The regular responsible high-class railway and bus service, as rendered by the company, has discouraged numerous competitors. In the early days of bus development many promoters appeared in the field, whose sole purpose was to inaugurate competing bus lines with the idea of selling these out at a profit to the then established operating concerns. This sort of promotion no longer forms a profitable occupation. There have been times when bus manufacturers have been tempted to back and finance the promoters of this kind of bus competition for the purpose of forcing the sale of their particular make of equipment. I am glad to say, however, that this practice is no longer considered ethical. Competition at its best in public utility service is expensive and the public must ultimately pay its cost. The best safeguard for both the public and the operators is to have all transportation utilities regulated by state authority.

The interurban railway furnishes its own right-of-way, nevertheless it is tremendously taxed due to its monopolistic character. The same legislatures that have taxed the interurban railways as monopolies have constructed highways with public funds and permitted the unrestricted operation of competitive bus and truck service over such roadways. This condition is being rapidly changed by the ever-increasing taxes which are being applied to bus operation and by increasing demand for proper state regulatory measures. In the instance of one company, it might be stated that the taxes and municipal

*Abstract of a paper presented before the Central Electric Railway Association, Indianapolis, Ind., Jan. 28, 1926.

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fees for operating a 29-passenger intercity bus in Wisconsin now amount to nearly $800 a year. It is certain that as the bus industry expands it must be placed under the same state supervision and regulation as other carriers. The ultimate result must be that the buses will serve territories not now adequately served by interurban railways.

Even at this time it is found that the public sometimes shows a preference for the electric railway instead of bus service. This was demonstrated in the case of the village of Whitefish Bay, a suburb of Milwaukee, in the fall of 1925, where the company offered to substitute buses on a parallel concrete road, giving more frequent service with the bus than with the existing cars. The trial operation was made for a period of 30 days and then an additional trial of 30 days operation giving parallel electric car and bus service. A referendum was taken at the polls, resulting in a two to one majority in favor of restoring the car service. The principal influences which prompted this decision were the fear that the buses, being unregulated, might be discontinued at any time if found unprofitable and that the buses might not be found as dependable in case of heavy snow.

To undertake to give reliable and continuous transportation service to a community is no light obligation. The interurban railways have demonstrated their ability to do this and have shown their willingness to spend large sums of money when required to clear the lines of snow and in other ways to maintain continuity of service.

Development of the bus business has been so rapid in the past five years that any equipment more than one year old at this time might be considered out of date. Neither bus operators nor equipment manufacturers can well predict what will be the last word in bus development. The manufacturers are in a continual state of despair because nothing can be standardized and every job must have special features. The de luxe bus of today may be passé next spring. However, we venture to prophesy some of the features that may be expected following the present trend of intercity bus development:

1. Weights of buses for interurban service will not be materially increased. Highway officials will see to that.
2. Interior frills and fancies must yield to more plain and substantial features which can be maintained with reasonable expense. Comfort and ease, however, cannot be sacrificed. Headroom may be increased and the general heights made greater, especially where there is heavy short distance riding.
3. More steel and metal and less wood will be used in frames and bodies.
4. Balloon tires are being tried and if found practical may be adopted.
5. Four-wheel brakes of pneumatic or hydraulic types will be considered essential.
6. More powerful engines will be developed, possibly by adopting eight cylinders, but certainly not less than six. Bus patrons are just as particular about vibration and excessive gear noises as the private car driver.
7. In general, riding qualities of buses will more nearly approach private car standards.

An important feature in the trend of bus operation is the development of proper standard sizes of buses to be used for various conditions of traffic. This requirement must be determined for each locality and for each condition of traffic. There is no doubt but what the lighter weight vehicles traveling on more frequent headways will draw additional traffic. Any decrease in seating capacity, however, increases the operating cost per seat. A bus which carries only eight or ten passengers must average 50 per cent of its seats filled over every mile of its operation to pay its way, whereas a bus which seats 29 passengers may be operated with an average of 30 per cent of its seats filled at all times. It is obvious, therefore, that if smaller vehicles are used either the traffic must be fairly dense or a higher rate of fare must be charged.

The financing of bus operations presents special problems. Although the investment required is not large compared with that for railways, working capital is needed, the financial risk is high due to the uncertainties of the business and the borrowing power is relatively low due to rapid depreciation of the equipment. Properly enforced state laws requiring certificates of convenience and necessity or equivalent broadly protective franchise grants are essential to the financial welfare of any public transportation utility. The trend of bus line ownership is toward the larger, well-established companies which have developed valuable properties, and especially toward those which have earned the full confidence of the public and in which the public has acquired a direct financial interest by purchase of preferred stock.

Determination of Satisfactory Bus Fares*

By R. R. Smith
Vice-President and General Manager
Chicago, South Bend & Northern Indiana Railway

DEVELOPMENTS in the interurban and bus business in the State of Wisconsin are dealt with in Mr. Pinkley's paper. On the whole, his conclusions and findings as to the trend of interurban and bus service apply equally well in the State of Indiana. This being true, it may be interesting, and it may throw some additional light on the subject, to outline some of the experiences through which the company I represent has passed in endeavoring to meet the situation created by the bus.

In my opinion the real menace to the electric railway industry is not the bus. It is the privately owned automobile. That is the threatening cloud on our horizon.

The Chicago, South Bend & Northern Indiana Railway was the first electric railway in the State of Indiana to operate buses. Like the Milwaukee company we early decided to protect our position as the natural and proper agency to furnish whatever transportation was reasonably demanded by the public in the territory served by our lines. However, we did not reach this decision in regard to our interurban service until we had felt the effect of bus competition by independent operators. We had previously established city bus lines in territory not served by street railway lines.

As soon as our interurban lines began to feel the effects of unregulated bus competition we established intercity bus lines paralleling the interurbans. Where possible to do so at a reasonable price, we purchased the bus line of our competitor. Where our competitor had an exaggerated opinion as to the value of his line, we put on our own buses. In some localities this resulted in the field formerly served only by the interurban being served by two bus lines in addition. One serious effect of this overdose of transportation was to educate the public to demand more service than could possibly be given at a profit. With a rate of fare on the bus lines sufficiently below the interurban rate to attract travel, it is not difficult to make a guess as to what happened to interurban earnings.

In June, 1925, we decided it was time for us to begin a series of experiments with interurban equipment and also with our rate of fare. We had two objects in mind: First, to ascertain the effect on the volume of traffic of a new type of interurban car at a lower rate of fare than our basic 3 cents per mile, and, second, to convince our bus competitor that we could so reduce his income as to force him to do business at a loss.

We placed in service two interurban parlor cars equipped with individual chairs, carpeted floors and a new lighting system. In these cars the wooden bulkhead between the motorman's compartment and the smoking compartment was replaced with glass. We changed the position of the heater so as not to obstruct the view of the passenger who wished to look ahead down the track. It is certainly not particularly pleasant for a passenger to gaze at a wooden partition, and we argued that if he could look ahead along the road in a bus, why not in an interurban.

On one interurban division we established an excursion rate of 1½ cents per mile, with a 25 per cent reduction for commutation riders. On another division we established an excursion rate of 2 cents per mile, with the same reduction for commuters, and on our third division we maintained our old basic rate of 3 cents per mile. All rates were made good for single one-way trip on every train, and on account of the fact that commutation tickets were sold by the drivers of buses we placed commutation books in the hands of our conductors so that passengers need not be put to the inconvenience of going to any of our stations to purchase them. Every interurban conductor was practically made an agent of the company for the sale of tickets. The rate of fare on buses was made the same as on the interurbans. We were therefore in a position to study the effect on travel of three different rates of fare and also in a position to study the effect of having interurbans and buses operating at the same rate of fare.

From the day it was established the 1½-cent per mile rate showed for a period of three months an increase of 92 per cent in the number of passen-

*Abstract of discussion before the Central Electric Railway Association, Indianapolis, Ind., Jan. 29, 1926.

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gers carried by interurban lines. The 2-cent rate showed an increase of approximately 70 per cent, while the number carried on the 3-cent rate showed a consistent decrease. Buses, at the 1½-cent rate, showed practically the same increase in number of passengers as the interurban. From the increased number of passengers carried, it was evident during this period that many owners of private automobiles put up their cars and made use of either the bus or the interurban.

Within three months our principal bus competitor negotiated with us, with the result that we were able to purchase his certificate at a reasonable figure. Since gaining control of the bus lines, we have continued our experiments with our interurban rates, using 2 cents per mile on interurban cars and 2½ cents per mile on our buses, with 25 per cent reduction in commutation rates. With these rates of fare in effect, we showed in the months of November and December, 1925, an increase in the number of interurban revenue passengers of more than 60,000 compared with the same months of 1924. The number of passengers carried on our intercity buses, however, has shown a steady decrease since the establishment of the 2½-cent per mile rate. It seems evident to us that the rate of fare charged is a very considerable factor in determining the distribution of traffic as between interurbans and buses.

We now control all intercity bus operation in our territory except one stretch of 14 miles. Service has been co-ordinated so that where we formerly operated hourly interurbans we now operate in addition an hourly bus schedule, so staggered as to give a half hourly service on one type of vehicle or the other.

Our parlor cars have been operating at the same rates charged on other cars and have proved very popular, so much so that it is now a problem to care for the number of passengers who wish to use them. The decreased seating capacity of the parlor car makes it possible to handle only about 50 per cent of the number of passengers which can be carried on the old type of car. The exclusive use of parlor cars would therefore mean a very considerable increase in interurban equipment.

In that an intercity bus usually picks the passenger up at his door or drops him there, we feel that that service is a preferential one. The passenger should therefore pay more for this class of service than for the interurban, where he may have to walk a half mile to the nearest stop.

From our experience we have drawn certain conclusions, which may be summed up as follows:

We are convinced that the character of service and rate of fare are large factors in the success of interurban service. Interurban cars must be comfortable, clean and fast. While these three qualities are essential, please place the accent on comfort.

When bus competition was first started, if we had met it by improving our interurban service and adopting a lower rate of fare, it would have been possible to prevent a large part of this competition.

The bus is admirable for opening new city lines and in interurban territory not served by other means of transportation. In territory adequately served by existing lines the independent bus will eventually be eliminated.

The bus fits in very well in handling summer excursion business. The automobile has educated the traveling public to the point where it does not always want to return to the same old amusement resort. The bus meets this need.

In bus service the selection of the proper size of vehicle for the service to be performed is an important factor. It may mean the difference between a profitable and unprofitable operation. Today the cost of taxes and passenger insurance on a 25-passenger bus in intercity service in Indiana approximates $875. If a 21-passenger vehicle would perform this service there would be a very considerable saving in this one item.

Properly co-ordinated bus and interurban service has its place in thickly populated territory, the bus taking care of local business and the interurban handling through limited business.

Finally, it is our conclusion that while the interurban and the bus each has its proper field, the bus is not nearly the menacing and serious problem it was a year ago.

Experience with Interurban Railway and Bus Service*

By R. N. Graham
Manager of Railways Pennsylvania-Ohio Electric Company, Youngstown, Ohio

SINCE Mr. Pinkley has covered the full amplitude of his subject, I will content myself with discussing those phases wherein the operations of the company by which I am employed differ from those more particularly noted by Mr. Pinkley.

The interurban services of the Pennsylvania-Ohio Electric Company were originally developed as extensions to urban street railways, so the tracks in general follow the public highway and were primarily intended to serve growing suburban residential districts. Our rights-of-way in general are subject to the burdens of street and highway improvements.

No part of the United States is free from problems presented by the ever-increasing use of the private automobile, and these problems are acute in the case of our own property. Under these circumstances the natural line of reasoning seemed to call for two policies:

1. To endeavor, by any reasonable means in our power, to preserve our traffic in the face of the competition of the privately owned automobile and necessity of advancing fares.

2. To reduce expense of operation in conformity with changed conditions.

Both these policies pointed to the necessity for acquiring a new type of equipment. From the standpoint of preserving our traffic, it was necessary that our interurban cars should be comfortable in seating and in riding qualities, attractive in appearance, well lighted and well ventilated.

Fortunately, with the developments in the art, it was possible to secure cars not only attractive in appearance and riding qualities, but at the same time furnished with such modern electrical equipment and of such light weight as to reduce materially expense of maintenance and cost of power. These cars were designed for one-man operation, which made a further saving.

Within the past three years all of our interurban and suburban lines have been equipped with cars of this modern design. We operate no cars in passenger service on any of our interurban or suburban lines which require the services of two men. As a result of the light weight of these cars it has been possible, with the same expenditure in maintenance of track, to keep our roadbed in much smoother and better condition, and even with very much reduced cost of maintaining equipment it has been entirely feasible to keep our rolling stock in such condition as to paint, upkeep and cleanliness as to render these vehicles attractive, with the general result that we are holding our own in traffic notwithstanding the very general increase over the country in the use of the privately owned automobile. Through the economy brought about by the use of this type of equipment we have more than held our own in the general operating result of our interurban and suburban operations.

With an experience of from one to three years on all our suburban lines with this type of equipment we feel that we can readily subscribe to the following conclusions:

1. That the operation of interurban and suburban cars in industrial districts of comparatively heavy traffic, with the use of one man on the car, is entirely efficient and satisfactory.

2. That the substitution of lightweight, attractive, modern equipment for heavier interurban equipment of the older type under such conditions is entirely justified from an economic standpoint.

3. That the expenditure to provide new equipment with comfortable upholstered seats, attractive lighting fixtures, plate glass window and good floor covering produces an adequate return in greater inducements to the riding public.

In the keen competition with the advantages offered the industrial rider by the use of his private automobile it is necessary to give concentrated attention to the subject of schedules to best serve individual manufacturing plants which may be located on the various lines. Special fare should also be studied which might be an inducement to special groups of riders, such as those working at industrial plants.

*Abstract of discussion before the Central Electric Railway Association, Indianapolis, Ind., Jan. 28, 1926.

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Further attention must be focused on the development of courtesy and salesmanlike attitude on the part of the operators of the cars. To overlook means or methods of advertising our product is to lose a valuable opportunity to improve the gross.

We were early compelled to parallel our suburban lines with bus lines in order to meet bus competition. While we still maintain such lines, they are in no case directly parallel except in point of route. The bus fares are higher than the corresponding railway fares and the bus service is being maintained as a supplementary or express service for those willing to pay the higher fare for a different sort of transportation.

On the other hand, it has been our policy, both in city and in interurban operation, to extend bus service into localities where no street railway service exists at the present time. In our operation we use 57 city buses and 27 interurban coaches. During the year 1925 our gross income from bus operation was approximately $1,000,000.

From our experience we find that when a superior service is given by the bus the people have no objection, apparently, to paying more money to take the bus, but when the quality of service is substantially the same we have found little difference between the attitude of the public on those routes that are served by street car lines and those served by bus lines.

In city operation the chief handicap of the bus is its limited carrying capacity, and we feel that the single-deck city bus cannot be operated profitably at the city rate of fare except where the lines are short, in our own experience the critical length of bus route being 3 miles.

In the operation of buses, the same as in the operation of street cars, there is a benefit to be derived from standardization, in economy of buying and storing parts. If a vehicle is originally well designed for the service in which it is to be run it is hardly necessary to change it with every passing whim or fancy of the body or equipment manufacturer. In this connection I think that we may still be guided by the essayist who said:

Be not the first by whom the new is tried.
Be not the last to lay the old aside.

The Utility Powder Puff Versus the Utility Razor*

By Helen E. Steiner
Director Public Relations Ohio Public Service Company

WHAT the world needs at present is not more power but a more wise distribution of power; not more energy, but a wiser conservation of energy; not more capacity, but more personality. It is horse power that we as a nation have developed for the last hundred years, and not human man and woman power. Every man here should take heed and develop his man and woman power. That is the most important work you can do in your relations to the public—build up your man and woman power, make it better, make it more adaptable.

A mechanic can fix your automobile if it goes awry, but when something goes wrong in your organization, in your contacts with the public, you cannot go to a garage for the remedy. You must then have experts in humanics and not mechanics. As "a man is judged by the company he keeps" so a public utility must be judged by the employees it keeps.

Public utilities are daily becoming more sensitive to that fact. They are, at least most of them, educating their employees in the knowledge of the company and its business and in the matter of public relations. Employees should all be schooled in the art of handling the public, for public regulation of utilities calls for 100 per cent co-operation from every man and woman on the payroll. No company can afford to keep an employee who does not live up to an appreciation of this fact. It is worse than money wasted, it is an investment jeopardized, for any employee not to work in the closest possible harmony with the executive heads who are putting their whole souls into the building up of good public relations.

The place of woman in the business world is just as legitimate as that of man, and it offers equal opportunities and possibilities. Woman is looked upon in a great many cases as only a pencil pusher or a key puncher with the ability to do one thing perfectly—namely, to "powder her nose." We can't hold that against women, for we all have our little vices and idiosyncrasies, and while woman is queer a man is still more queer! For to him it's the razor that is nearer and dearer. That thought has given me my subject this morning. The "Utility Powder Puff vs. the Utility Razor" is but a polite way of putting the age-worn question, Why not have women in the industry filling the same places that men occupy and receiving equal recognition?

Although Christopher Columbus is given credit for the discovery of America, it was a woman who had the faith to look beyond the superficial beliefs of the ages and to see possibilities which brilliant men had rejected as impossibilities. Had it not been for Queen Isabella of Spain, Columbus might never have had the ships with which to cross the ocean.

Behind every great event in life—past, present and future—may be found the hand of woman if we but search for it. Women today are gradually taking their places in the business world and exerting their influence directly, where before they exercised it indirectly.

Are you men in the railway industry capitalizing on the genius and ability of your women employees, and on women in general? Are women playing as great a part in your industry as they should? Are they contributing to the upbuilding of better public relations?

In seeking a satisfactory solution of the public relations problems you men have learned to attach a deeper significance to the word "Service." The thought of serving, of helping and of doing more than just that which is paid for, is becoming more and more a dominant note. In order to make your service of greater convenience to your customers you must consider more than their mere legal rights and imperative necessities. Service has an intangible value that cannot be measured in dollars and cents or by yard sticks or tape lines. It spreads and grows from day to day. We might say it is cumulative and compounds daily. Good service becomes an amazing asset, poor service becomes a liability. You can sell transportation to mankind, but its greatness depends upon the degree of service rendered.

Service is not entirely dependent upon the quality of your commodity, but real service means the smile and pleasant greeting accorded patrons; it means quick and efficient handling of complaints; satisfactory adjustments; in short, it means what money cannot buy—the intangible something that makes a man feel that he wants to have more dealings with your company. Such a condition can come about only through the channels of properly trained employees and more prominence accorded to woman. For I believe that a woman in most cases is more efficient than a man in meeting another woman. Women in every department of your industry can appeal more forcibly to other women, who form the major portion of your passengers.

*Abstract of a paper presented before the Central Electric Railway Association, Indianapolis, Ind., Jan. 29, 1926.

A.S.M.E Asks Help for French Exchange Professorship

IN ORDER to effect the full exchange of French and American professorships, the American Society of Mechanical Engineers, through the activities of its secretary, Calvin W. Rice, is attempting to secure contributions from those who may be interested in aiding this cause.

For some years there have been a number of scholarships under which students may study in foreign lands, but too little provision has been made for an exchange of professorships. The simple exchange of one outstanding educator from European schools makes it possible to establish a valuable contact for thousands of students. For a number of years seven American universities, Columbia, Harvard, Johns Hopkins, Cornell, University of Pennsylvania, Massachusetts Institute of Technology and Yale, have been exchanging professors with the universities in France. Eminent men have thus had the opportunity of broadening their views and many students have profited in this exchange.

Those who are interested should communicate with Calvin W. Rice, who will be glad to receive contributions.

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American Association News

American Executive Committee

Many Important Matters Discussed and Progress Reports Received at Indianapolis Meeting

SINCE there was no midyear meeting of the American Electric Railway Association this year, the regular meeting of the executive committee was held at Indianapolis on Jan. 29 in connection with the midwinter meeting of the Central Electric Railway Association. There were two sessions, the first taking up regular business. A luncheon meeting followed, at which the committee chairmen presented oral reports of progress.

At the morning session the members present were President F. R. Coates, Managing Director Lucius S. Storrs, Executive Secretary J. W. Welsh, Harry Reid, C. L. Henry, H. L. Brown representing E. F. Wickwire, J. H. Hanna, J. H. Handlon, C. R. Ellicott, E. P. Waller, T. A. Kenney, M. B. Lambert, A. W. Brady, G. H. Clifford, J. N. Shannahan, C. R. Harte, J. J. Stanley, S. J. Cotsworth, B. A. Hegeman, Jr., and Thomas Finigan.

The budget submitted by the Engineering Association for the expenditure of funds appropriated at the last meeting of the executive committee was approved and referred to the finance committee for action.

The publicity committee reported that a series of speeches has been prepared by Labert St. Clair under its supervision. These have been worked out in co-operation with the state and sectional committees on public utility information. It was reported that the manufacturers' campaign is well under way. Posters, stickers and signs have been prepared, as announced previously in this paper. The demand for these up to date has been considerably greater than was anticipated.

For the membership committee, Mr. Hanna made a detailed report. The result of the campaign for new members has been very encouraging. There has been a growth of 128 manufacturers in the past three years, or more than 50 per cent, while the railway members have remained at the same number, even though there have been not a few consolidations in this period.

Telegrams of regret that they could not be present at the meeting of the executive committee from W. H. Sawyer and G. H. Harries were read by the chairman.

Harry Reid, for the committee on national relations, stated that the bill for the regulation of interstate bus lines sponsored by the National Association of Public Utilities Commissioners has been introduced both in the Senate and in the House. He hopes that hearings will be held during the month of February. Attention was also called to other pending legislation, including the railroad labor bill and the Cummins transportation act.

On motion of Mr. Reid, made at the suggestion of H. L. Stuart, it was decided to reprint the speech of Managing Director Storrs made at the C.E.R.A. banquet Jan. 28.

Mr. Reid announced the death of W. H. Maltbie of Baltimore, a chairman of committee on special taxes and of the committee on valuation. It was the expression of the executive committee that this loss leaves a place that it will be difficult to fill.

J. J. Stanley, J. H. Hanna and A. W. Brady were appointed a committee to prepare suitable resolutions on the death of Mr. Maltbie.

The publication committee presented a brief report through Mr. Welsh. The progress of *Aera* was noted. Attention was called to the preparation of pamphlets on education in collaboration with the committee on that subject.

Chairman C. E. Morgan of the committee on location had planned on attending the meeting, but because of a train delay was unable to be present until the luncheon meeting. This made it impossible to hold a meeting of his committee prior to the executive committee meeting. Mr. Stanley and Colonel Alexander of Cleveland invited the association to that city for the convention. Mr. Ellicott pointed out that the association should go where it will get the most for the money expended. Cleveland is near the center of the country and also near the center of the automotive industry. Its facilities are excellent.

Mr. Hanna called attention to the meeting of the conference on street and highway safety which will take place next March. He felt that it is a subject of great importance to members of the association.

President Harte of the Engineering Association presented a plan for the elimination of a great deal of the routine business of that association at the annual meetings. The principal feature of this is elimination of the procedure of acting on standards submitted by the various committees on the floor of the convention, and substituting a letter ballot. This would give time for the consideration of live topics and the presentation of papers and discussion. After some discussion, in which it was brought out that the floor vote is not representative, and sometimes leads to disregard of the standards adopted, it was approved.

The special committee on awards, of which Mr. Storrs is chairman, reported that propositions had been received for contests among electric railways from *Electric Traction* and *Forbes* magazine. The report was referred to the committee on policy.

Resolutions were adopted on the death of past-president John I. Beggs. The death of Past-President Joel Hurt was announced.

Committee Chairmen Report at Luncheon Meeting

Following the morning session, the members of the executive committee and committee chairmen were guests of President Robert I. Todd of the Indianapolis Street Railway at a luncheon given at the Indianapolis Athletic Club. The principal business at this meeting was to hear reports of progress from the various committees of the association. This is a new feature, which was begun by President Coates at the November meeting of the executive committee.

J. H. Handlon, for the Claims Association, reported that excellent progress is being made by that association. For the advisory committee on electric railway finance, H. L. Stuart stated that the total public financing of purely electric railways last year, in amounts of more than $250,000, amounted to approximately $30,000,000. The electric railway securities, he said, were wholesaled very quickly, some of the issues going in less than two days. Mr. Stuart strongly recommended campaigns for local stock ownership. Mr. Lambert said that in his talks with electric railway men a question that has been asked is where they can get money for improvements.

In the absence of Mr. Wickwire, Labert St. Clair gave a brief report of the committee on co-operation with manufacturers. He described the signs and posters that had been prepared. Advance requests had far exceeded early estimates, he said, so that he will have to revise his figures for printing the posters.

Mr. Clifford stated that the work of the committee on co-operation with state and sectional associations was progressing in fine shape in all but two districts. Steps are being taken to arouse interest in these districts, and it is hoped that definite results will be had in the near future.

For the education committee, H. H. Norris, speaking for Edward Dana, said that the plans announced at the last executive committee meeting are under way. The committee on management and operation has been co-operating closely with the education committee. At the suggestion of Chairman Carbutt of the former committee, a demonstration of a foreman conference was put on before the Central Electric Railway Association the day previous, for the benefit of both that body and the education and management and operation committees. Mr. Lambert brought out that this conference had been held at considerable expense, the Boston Elevated Railway, the Indianapolis Street Railway and the T. H., I. & E. Electric Railway having furnished men to make the demonstration possible. On his motion, a vote of thanks was given these companies for their co-operation.

G. C. Hecker, secretary of the management and operation committee, represented R. F. Carbutt, who had been called away. He outlined the meeting which had been held Wednesday night at Indianapolis. This committee, he

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said, is planning to have an extensive campaign of visits to various properties.

The manufacturers' engineering committee held two meetings, said Chairman G. C. Hecker. The first problem was to design a series of cars and the second to make operating studies showing where new cars have reduced maintenance expense and have increased riding. The committee is also studying methods of refinancing to make the purchase of new cars possible.

Charles Rufus Harte, the new president of the Engineering Association, outlined the change in organization of the Engineering Association by which the way committee and the building and structures committee have been combined. Mr. Harte also asked that the association use the Engineering Standards. He stated that a great deal of work is done by the engineers and the standards are not always used.

President Coates reported that a letter of invitation for the 1926 Charles A. Coffin prize contest has been sent out.

For the Transportation and Traffic Association, Mr. Clifford stated that it is working on four principal subjects. There is a great deal of enthusiasm in this association and he is looking forward to an excellent convention.

C. E. Morgan, chairman of the committee on locations, was detained in New York and did not arrive until near the end of the luncheon. He stated that sub-committees had visited Cleveland and Atlantic City, and that propositions had been received from other locations. No meeting of the whole committee had been held, so that no recommendation was made. Mr. Morgan told of the possibilities of these various locations. In order to facilitate preparations for the next convention, a sub-committee of the executive committee was appointed to consider the report of the committee on locations with power to act. This sub-committee consists of C. E. Morgan, chairman; T. A. Kenney, J. H. Hanna, Harry Reid, E. P. Waller, Thomas Finigan and C. R. Ellicott.

The executive committee decided to hold the convention on Oct. 4-8 inclusive.

Following a vote of thanks to Mr. Todd for his many courtesies in connection with the meetings of American Association committees held in Indianapolis, the section adjourned. The next meeting of the executive committee will be March 26 at New York.

Management and Operation

ON JAN. 27, following a dinner arranged for through the courtesy of L. M. Brown, a meeting of the committee on management and operation was held at the Indianapolis Athletic Club, Indianapolis, Ind. Members present at the meeting were: R. F. Carbutt, chairman; Morris Buck, C. L. Van Auken, E. J. Dickson, H. H. Norris, S. E. Emmons, D. J. Locke, A. C. Spurr, J. E. Wayne, G. B. Powell representing Samuel Riddle, F. L. Butler, L. M. Brown, J. F. Johnson, R. R. Smith, J. S. Hyatt, R. H. Pinkley, W. H. Burke, C. J. Griffith, W. W. Holden, A. Blunk representing S. B. Irelan, R. J. Lockwood, G. I. Plummer, R. R. Hadsell and G. C. Hecker. Frank R. Coates, J. W. Colton, Labert St. Clair, G. H. Clifford, T. O. Kennedy, A. E. Scott, James Harmon, J. Q. Martin, John Mellett, J. H. Handlon, J. B. Stewart, Jr., and C. F. Young were present as guests.

Chairman Carbutt stated that this meeting had been called primarily to discuss the procedure outlined for the committee this year. He then introduced John Mellett, executive secretary Indiana Public Utilities Association, who delivered a brief address of welcome.

F. R. Coates, president of the American Electric Railway Association, expressed his appreciation to the members for their participation and particularly for their attendance at this meeting. He spoke of the excellent work done in past years and said he was sure the committee would continue its activities this year with even greater enthusiasm.

Chairman Carbutt read a telegram from Managing Director Lucius S. Storrs, who expressed regret at his inability to be present, stating that he felt there were great possibilities for bringing about improvements through the collection and dissemination of information by personal visits of committee members. He also said that they can be of great service in ascertaining personal opinions of railway executives regarding the major problems on which the association should concentrate for the best interest of the industry. The chairman then informed the committee of the death of two of its members, Ralph D. Hood, Haverhill, Mass., and F. I. Fuller, Portland, Ore.

The procedure outlined by the advisory board, consisting of the chairman and regional directors, was read by Mr. Carbutt. He then called on the regional directors to discuss the proposed procedure and to comment on the work done during the past two years.

Mr. Boyce expressed his thanks to the members in his district for their attendance at the meeting and his appreciation for their co-operation last year. He said that it would help members making visits if both Mr. Storrs and Mr. Coates would write to the managements of the properties to be visited advising them of the coming of the committee members and asking them to be prepared to discuss important problems with them. In some instances, he said, considerable time was wasted because appointments had not been made and members were unable to obtain interviews.

G. B. Powell expressed Mr. Riddle's regret at his inability to be present and stated that District No. 3 may be counted upon actively to carry out the committee work this year.

L. M. Brown stated that in his opinion the members through their visits receive the most benefit from the committee activities. In the work last year the managements of the properties he visited were glad to see the committee members and discuss their problems. While certain practices in operation on one property might not be applicable in just that form on another property, with modification they might be used on many properties. He spoke of the visits of electric railway men from various parts of the country to the property of the Interstate Public Service Company, and said that if individual companies found it worth while to send their men out to visit other properties certainly the industry as a whole should benefit through the work of this committee.

W. H. Burke said that he is planning to divide District No. 6 so as to have members cover the entire territory. In Mr. Burke's opinion the idea of modernization and popularizing service should be stressed by the members in their visits. He also felt that the committee members should interest managements in competing for the Charles A. Coffin prize. Mr. Burke then told of attending the November meeting of the Midwest Electric Railway Association in Wichita, Kan., as a representative of the American Association. In an address at that meeting he attempted to acquaint the delegates more fully with the work of this committee.

The secretary read a letter from D. W. Pontius, in whose opinion the subjects covered during 1925 still furnished a large field for development and can be considered further in the order of their importance.

A. L. Hodges, New York City district, was absent. R. R. Hadsell stated that Mr. Hodges had arranged to hold a meeting of the members of his district on Jan. 27 and that he had made an allotment of the companies in the district to the members so that every company will be visited.

The secretary read a letter from D. E. Blair of the Canadian district, who stated that he had heard many favorable comments on the committee work from executives in Canada. He stressed the importance of properly editing the data collected by the committee and compiling it in convenient form for later reference.

J. W. Colton told the committee members that the information collected in 1924 and 1925 was now being published in a handbook of approximately 300 pages. Mr. Colton felt that a great deal of valuable information had been collected. Mr. Carbutt said that the American executive committee had underwritten the publication of the new handbook to the extent of $3,000. He stated the book would be placed on sale at approximately $2. Secretary Hecker spoke briefly about the handbook and said that it was planned to initiate an advertising campaign to promote the sale of the book. It was his belief that the book would be available for distribution within the next six weeks.

Labert St. Clair reviewed briefly the organization of the committee and said that the results of its work can already be seen, especially in the publicity and advertising activities of various companies throughout the country. Next to modernization Mr. St. Clair believes that selling service is the most important problem of the industry. He urged the members to go to the newspaper editors with the executives of the properties visited and get their viewpoints. He felt sure that the newspapers would be glad to publish any news which the committee members would give them and urged that such news be given local color. He also urged close co-operation with the Public Utilities Information Bureaus, of which he said there are 25 in 37

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states. A recent survey made by Mr. St. Clair shows that in all but four states these bureaus are receiving support from electric railways.

Mr. St. Clair then spoke of the work of the advertising section of association headquarters. He said that in addition to the regular service rendered by the department it is always glad to give special service desired by a member company.

H. H. Norris represented the committee on education and outlined its objects and its plans for putting information into the hands of the members of the committee on management and operation, so that the latter might assist in promoting educational work. Mr. Norris said that four pamphlets are now being prepared for distribution to the committee on management and operation which will outline the reasons for educational work and tell how to start an educational program. He spoke of the foremen conference plan and the group conference plan, both of which are in effect on the Boston Elevated Railway.

The meeting was then opened to general discussion. In response to a query by Mr. Boyce, it was the general opinion that photographs and drawings should be obtained with contributions wherever possible, as these could be used should it be found that it is desirable to publish a supplement to the handbook.

Mr. Blunk felt that committee members should not fail to acquaint those whom they visit with the activities of the headquarters staff, and called attention to the vast amount of information available to members at association headquarters.

Reports from regional directors should be completed and forwarded to the secretary not later than July 1, said Chairman Carbutt, answering a question by Mr. Smith. They will serve as the basis of the committee report, which will be prepared by the advisory board, consisting of the regional directors. Mr. Carbutt said that contributions for the handbook should be sent in as promptly as possible and that these could be continued after July 1, since probably the publication of a supplement would be withheld until after the convention.

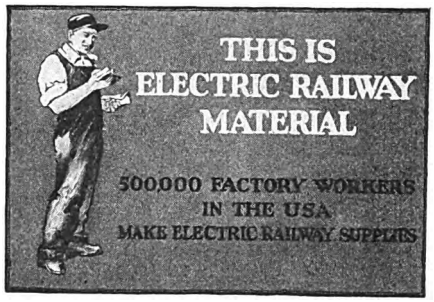
Mr. Kennedy called attention to the necessity of advising district managers of groups of properties of the coming visits of committee members so that district managers might check up with the local managers and assist in securing better co-operation.

Mr. Clifford stated that he was one of those at the last convention who disapproved of discontinuing this committee work. He said he believed that its activity offered greater possibilities than that of any other association committee. He spoke of the value of personal contact of its members with the managements of electric railways and also spoke of the value of educational work among employees. As to the work of the public utilities information bureaus, Mr. Clifford urged the members to send news to Mr. St. Clair to be passed along to the directors. Others who spoke briefly were J. Frank Johnson, W. W. Holden and C. J. Griffith.

At the conclusion of the meeting Chairman Carbutt urged the regional directors and members to begin their work immediately. He said he hopes this year will be the most successful one since this committee activity had been initiated.

Poster Campaign for Manufacturers

WITHIN the next few weeks the special committee on co-operation with manufacturers will endeavor to impress on the public the fact that some 500,000 factory workers are employed in making electric railway materials in the United States. Posters for bulletin boards, stickers for letters and express packages will be used to help carry this message. E. F. Wickwire, chairman of the committee, has circularized all manufacturer members, inclosing samples of posters, labels and stickers which will be supplied without charge in any quantity desired. All of them are of the general design illustrated above, the wording only being changed.



Labels of This Design Are Being Used in a Campaign Advertising the Industry

The outdoor sign feature of the campaign is being handled by the George H. Tontrup Corporation. Mr. Tontrup, as the only sign manufacturing member of the association, is co-operating with the committee in the preparation of a special sign, the wording of which is similar to that on the posters. The cost of these signs will range from $35 upward, depending entirely upon the quality. All signs are of the same size, but some are illuminated and others are not.

Electric railway companies also will co-operate in this campaign by displaying posters in their cars and using stickers on their letters.

Claims Executive

ON JAN. 29 the executive committee of the Claims Association held a brief meeting in the office of J. G. Bruce, claim agent Indianapolis Street Railway. Those present were President J. H. Handlon, J. S. Kubu, L. F. Wynne, G. T. Hellmuth and H. K. Bennett.

Subjects for the October convention were considered. Several topics, including collection for property damage, vehicle regulation and other means for promoting safety, and use of moving pictures in claims work, were considered. It was decided to obtain expressions of opinion from all members of the subjects committee and all claim agents.

T. & T. Executive Committee

REPORTS of committees and the program for the October convention were the principal topics considered at a meeting of the Transportation and Traffic Association held at Indianapolis on Jan. 27.

For the accident prevention committee M. W. Bridges stated that a large meeting of the joint committee composed of Transportation and Traffic members and Claims members had been held the same morning. At this meeting the relations between Claims and T. & T. Associations had been taken up and arrangements had been made so that both would work together. The aims this year are to get out statistics that will do the most good in accident prevention work and hold a joint meeting of the two associations at the convention, with men from each discussing accident prevention work from the point of view of each department. Some years ago, said Mr. Bridges, a standardization of accident statistics had been attempted by the American Association, but it had not been found possible to standardize as to causes. The president was empowered to appoint a committee of four with two co-chairmen to [illegible] a report on the subject. The sub-committee will send out questionnaires to collect statistics.

Several of the members spoke of accident classifications in use on their properties. Mr. Walker stated that on his road accidents are classified as avoidable and unavoidable. The number of avoidable accidents is an indication of the morale of the trainmen. Mr. Clifford said that on his roads accidents are classified in four groups. There is an honor roll for men having the best records. Mr. Powell said that in Louisville the costs of accidents are entered on each trainman's card. This record is kept up to within ten days of date. Mr. Clifford stated that in Texas on the Stone & Webster properties a campaign is being waged to show that the cost of accidents comes back on the car rider.

Labert St. Clair appeared before the committee and stated that as the Hoover conference will be finished next month, he will have time available for other work. He said he would like to have a poster campaign on safety and would be glad to prepare copy.

Mr. Stewart presented a progress report for the committee on bus operation. A list of some seventeen subjects which are being studied by this committee were discussed. Mr. Clifford said that if there ever was an opportunity to make progress for something that is popular this was the time. Care must be taken not to make the mistake of becoming tied down by a fare similar to the old flat street railway fare. The program of the bus operation committee was approved and President Clifford expressed his appreciation of the scope and thoroughness with which the work was being done.

Members present were G. H. Clifford, J. V. Sullivan, E. M. Walker, G. B. Powell representing Samuel Riddle and G. C. Hecker representing J. W. Welsh. Chairman M. W. Bridges of the accident prevention committee and J. B. Stewart, Jr., of the committee on bus operation were also in attendance.

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Maintenance of Equipment

Four-Section Tower Truck

Power-Operated Tower May Be Raised or Lowered Either from the Driver's Seat or from Platform of the Tower Itself—Large Spotlights Provide Illumination for Night Work

BY J. R. BRITTAIN
Mechanical Engineer Los Angeles Railway, Los Angeles, Cal.

IMPROVEMENTS in a gasoline-propelled emergency line tower truck are proving of great assistance in speeding repairs and reducing labor. This emergency truck has just been built and placed in service by the Los Angeles Railway. It is stationed at a central point, is subject to call at all times and operations in much the same manner as fire department apparatus. When the alarm is sounded, operators receive directions by telephone and the city accords them the same right of way over traffic as fire and police vehicles.

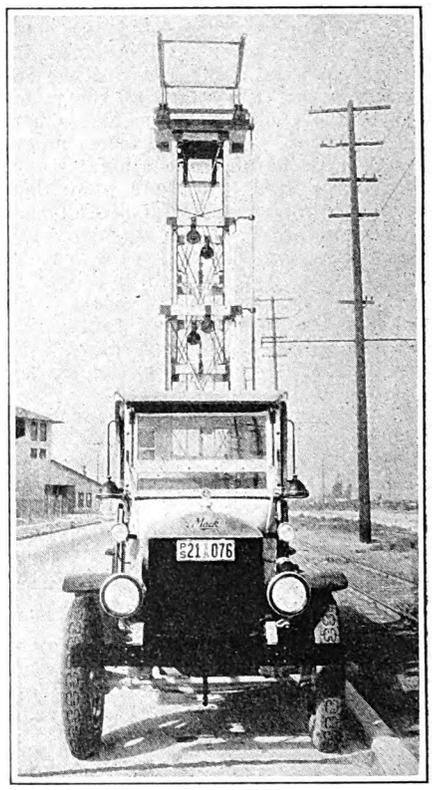
To provide safe and rapid wire repairs a four-section power-operated tower has been adopted. Linemen can stand on the floor of the tower platform, protected by the railing, and work safely on trolley wire at its highest point. The tower can be raised much higher than old ones used by the company and can also be lowered farther to give additional clearance under low points.

The engine of the truck has a power takeoff consisting of a set of gears with housing. This is operated by the engine clutch. The power takeoff gearing has an individual shift lever and can be disconnected from the engine when the hoist is not in use. The tower is raised and lowered by a mechanical hoist driven by the power takeoff. The hoist consists of an interlocking worm with gearing which has a large speed ratio. The hoist is driven through a connecting shaft with a universal joint at the hoist and a flexible thermoid at the power takeoff end. The gear shift lever for raising and lowering the tower is placed conveniently beside the driver's seat, so that the tower can be raised or lowered to suit the lineman's requirements, while he still remains on top of the tower. This eliminates the necessity of a lineman getting down each time to help the driver raise and lower the tower by hand power. The hoisting and lowering movements are protected by safety limit stops, which throw the shifting gear in a neutral position whenever the tower reaches its highest or lowest position.

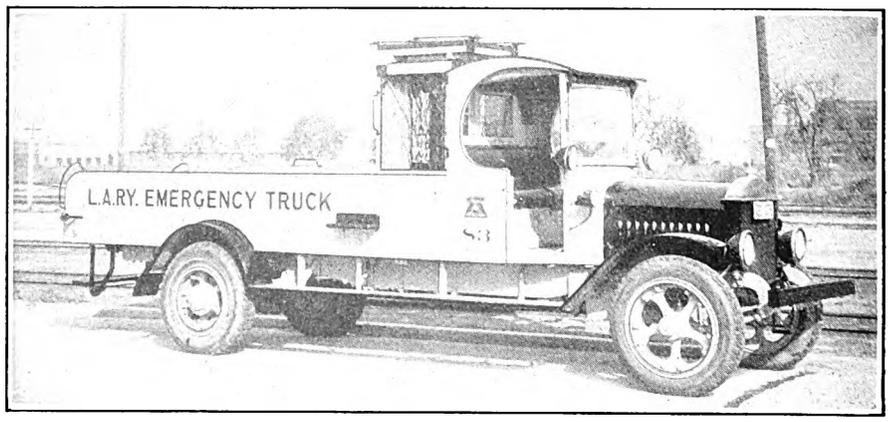
In addition to the driver's control, the tower can be raised or lowered by the lineman while he is on the tower platform. This control is provided by means of a telescopic collapsible shaft made of four square seamless steel tubes, each fitting into the other and connected to the hoist gear shifting mechanism. By turning a crank the lineman on the platform raises or lowers the tower to the exact amount required.

The tower hoist cable arrangement consists of two steel cables attached to two large sheaves mounted on the hoist shaft. The cables pass over two smaller sheaves fastened to the upper members of the first section and the cable ends are anchored to the lower members of the second section. Four cables are attached to the chassis and then passed over four sheaves and are fastened to the upper members of the second section. The cable ends are anchored to the lower members of the third section.

Four cables are attached to the lower members of the second section and pass over four sheaves fastened to the upper members of the third section. These cable ends are anchored to the lower members of the fourth section. Heavy wire guards are placed around the first section to protect the cables and sheaves from possible damage by objects which may be forcibly thrown against the



The Tower in Its Raised Position Provides for Work on the Highest Part of the Line and the Workmen Are Protected by Railings



The Emergency Truck of the Los Angeles Railway Presents a Neat Appearance and Is Arranged for Particular Convenience of Workmen

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tower. These guards also prevent linemen from getting hands or feet caught while the tower is being raised or lowered.

The truck chassis is of 2-ton capacity and equipped with a high-speed engine. Large pneumatic tires are used. The driver's cab is built of steel and is furnished as a part of the chassis by the manufacturer. The truck body was specially designed and built for emergency service. Two lockers are placed adjacent to and back of the tower for the small tools. The remainder of the body is used for larger equipment, such as jacks, blocks, rope, chains, etc. The body floor was built high above the chassis to provide sufficient clearance for lockers to hold the fire hose bridge.

Electric red lights are placed on the front, side and rear of the body. Two large spotlights are provided for furnishing illumination during repairs. Warning sirens which are electric motor operated and a hand operated warning bell are installed on the cab. The new truck has been in service slightly more than four months and has proved of extreme benefit in keeping cars moving during heavy peak loads. This is a very difficult problem in the city of Los Angeles, due to the great number of vehicles which use the streets through which the car lines operate.

Improved Axle Bearing Storage*

AXLE bearings in the shops of the Denver Tramway, Denver, Col., were formerly piled on a bench in groups by sizes and for various types of motors. This arrangement had the disadvantage that the bearings were not easily located and also that they presented an unsightly appearance. In order to improve this condition a large rack has been constructed which is divided into vertical and horizontal compartments. These are labeled with the type of motor and size of the bearing. Each compartment is provided with angle-iron slides so that the bearings are supported by the flanges or set upright on the bearing flange so as to rest on the angle irons.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

New Equipment Available

Westinghouse Builds Gas-Electric Bus

THREE well-known manufacturers—the Westinghouse Electric & Manufacturing Company, Fageol Motors Company, and the American Car Company — have worked together in the construction of the latest gas-electric bus. The engine is a Hall-Scott, mounted on a Fageol chassis, motors and control are Westinghouse, and the body is of the Birney type built by the American Car Company.

The electrical equipment consists of a shunt-wound generator, two motors, a main controller and a field resistance controller. The generator is direct connected to the engine through a flexible coupling. It is primarily a self-excited shunt generator, but is supplied with a small amount of separate excitation supplied from the 2-volt starting and lighting battery.

The generator is thoroughly ventilated and has a nominal rating of 53 hp. at 1,500 r.p.m.

Two interpole motors are used. They may be mounted in parallel or in tandem. When mounted in tandem they are connected together by means of a suitable flexible coupling and may drive the rear wheels through a standard automotive rear end. When mounted in parallel, a dual drive axle may be used. This permits one motor to drive one rear wheel independent of the other and assures traction on either wheel regardless of whether or not the other is free to spin.

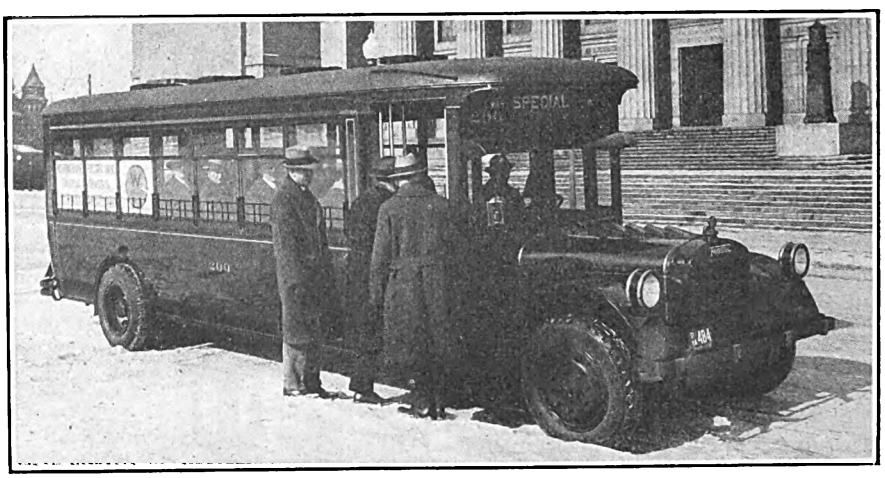
The motor ventilation scheme is similar to that described for the generator. Ball bearings are used. Each motor has a nominal rating of 25 hp. at 250 volts.

The main controller has six operating positions, one for "forward" operation, one "off" position, three for "electric braking" and one for "reverse." These are so arranged that the controller handle is moved forward for forward operation of the vehicle, and backward for reversing.

The controller is hand operated. It is built so that it may be mounted under the operator's seat or at any other convenient place where the shaft can be connected to the handle by means of gears and shafting or bell cranks and linkages. The handle may be moved from "forward" to "off" or "braking" by a single motion, but cannot unintentionally be moved from "forward" to "reverse" or vice versa.

A field resistance controller has been designed for mounting on the steering column. It is provided with an extended handle so that it may be operated without removing the hand from the steering wheel. A roller running over a notched plate enables one to "feel" the positions.

The purpose of providing for increased resistance in the main generator field circuit is threefold. Overloading of the engine is prevented when its capacity has been temporarily reduced for some reason. It permits the engine to reach a high speed in a minimum of time and if the resistance is then reduced maximum accelerations are obtainable on severe grades or with heavy



New Westinghouse-Fageol Gas-Electric Bus on Exhibition at Indianapolis

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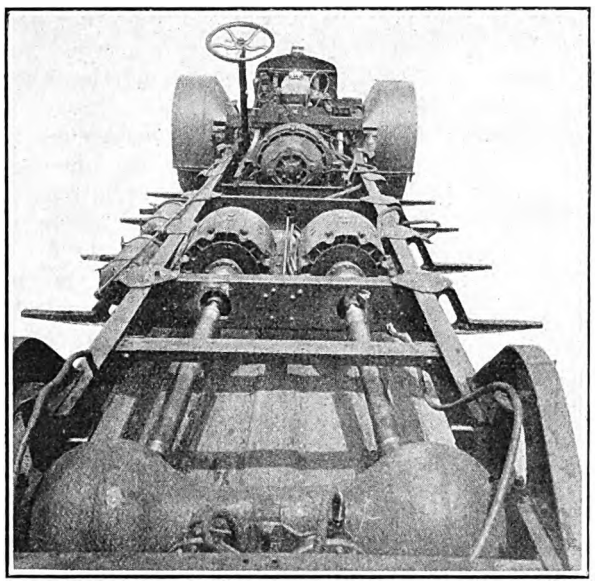
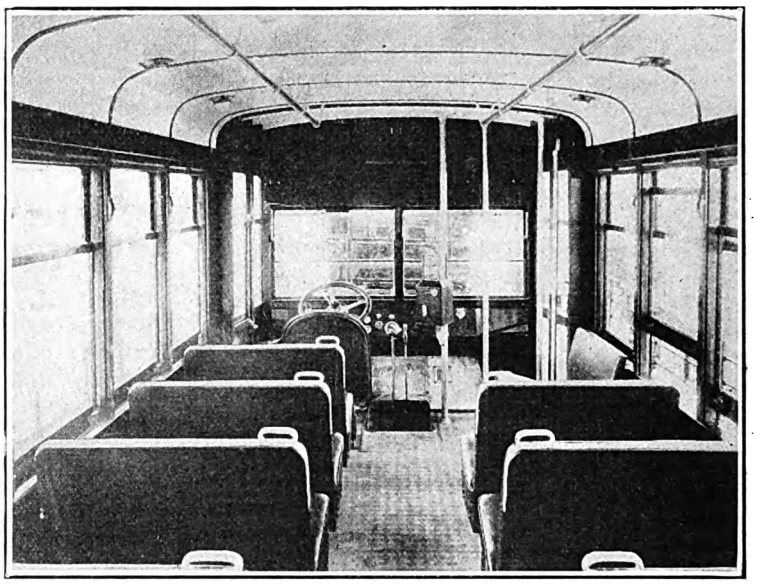




At Left, Driving Mechanism Consists of Westinghouse Type V-91 Motors Mounted on a Fageol Chassis. At Right, Interior of the Body, Built by the American Car Company, Closely Resembles that of the Typical Birney Car

loads. It has also been found by tests that there is a "best" combination of engine speed, resistance, and grade, to obtain the highest vehicle speed.

A small toggle switch is provided to open the battery field circuit. It is arranged to be connected to the foot throttle and operates so as to close the circuit when the pedal is depressed and to open it when the pedal is released. This eliminates unnecesary battery discharge as would occur when coasting and when the vehicle is stopped.

SPECIFICATIONS OF NEW GAS-ELECTRIC BUS

Weight with passenger load.....18,000 lb.
Wheel diameter .....30 to 36 in.
Gear ratio .....8-12 to 1
Free running speed .....30 to 50 m.p.h.
Schedule speed .....15 to 25 m.p.h.

GENERATOR

One Westinghouse type 177, nominal rating 53 hp. at 275 volts, 1,500 r.p.m.

MOTORS

Two Westinghouse type V-91, nominal rating 25 hp. at 275 volts, 1,800 r.p.m.

CONTROL

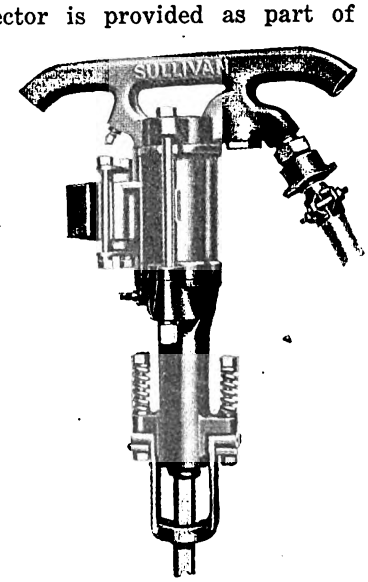
One Westinghouse hand-operated directional and emergency braking controller.
One Westinghouse steering column field resistance controller.

This gasoline-electric coach was built in St. Louis and has recently been driven on an initial demonstration tour with very satisfactory operating results. Cities visited have been Terre Haute, Dayton, Columbus, Toledo, Detroit, Cleveland and Indianapolis. It was demonstrated to street railway and motor bus company officials in each of the cities visited. During the tour from St. Louis to and between the cities mentioned, the gasoline consumption has averaged 5½ miles to a gallon.

Improved Concrete Breakers

TWO new concrete breakers of improved type have just been announced by the Sullivan Machinery Company, Chicago, Ill. These are DW-221 and DP-221. The valve for these breakers is an improved modification of the pioneer Sullivan drill valve. Its outstanding characteristics are light weight, rapid action, positive control of the piston and hard, snappy blows.

The valve mechanism is secured in the chest by side rods which hold the valve buffers and the single leaf buffer springs in position. The valve buffers are round pieces of tool steel turned and heat-treated. The valve itself is made from alloy bar steel especially heat-treated to resist shock and breakage. A hood or deflector is provided as part of the valve chest to throw the exhaust from the drill away from the operator.



Type DW-221 Concrete Breaker

The piston is made from bar stock of special alloy steel, ground after heat treatment to a close running fit in the cylinder. The forward end has a button turned on it, which lessens the possibility of upsetting and binding in the bushing if operated on poor shanks. The striking end is guided in a long bearing, which is a part of the cylinder.

The cylinder is a solid drop forging, machined, hardened and ground to exact size. The valve chest is not separate, but is a part of the forging. The bore of the chest is ground accurately and holds the valve chest bushings in which the spool valve reciprocates, so that in case of wear the bushing may be renewed without having to replace the cylinder. A dustproof chuck housing made from a solid drop forging bored out, hardened and ground incloses the chuck and chuck bushing. Lubrication of front end parts is by a tapped opening closed by a thumb plug.

The back head has an oil boss on top of the seat for the throttle valve. Oil can be poured into this chamber, which leads to the main inlet port. This carries oil through the working parts of the drill. A separate oil reservoir in the side of the cylinder provides an automatic oil feed through the main inlet port.

The DP-221 concrete breaker is a lighter type, fast-running tool, weighing but 41½ lb., while the DW-221 is a heavy-duty breaker, weighing 75 lb.

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The News of the Industry

Draft of St. Louis Grant Under Way

The rough draft of the franchise under which the newly formed Public Service Company of St. Louis, Mo., will be asked to operate when it takes over the properties of the United Railways has been prepared by City Counselor selor Muench is merely to be used as a ler and his special franchise committee. The substance of the proposed ordinance will not be made public until it has been finally approved by the committee. The draft prepared by Counselor Muench is merely to be used as a basis of discussion by the committee of which Mayor Miller is chairman.

In a general way the agreement between the city of Montreal and its railway will be followed in the preparations of the new St. Louis ordinance. The terms of the Montreal franchise will, however, be changed to conform to local conditions in St. Louis, particularly with respect to the size of the car system and the problems that have developed since the Montreal bill was put into effect in 1918.

Seven-Cent Fare in Louisville

The Louisville Railway, Louisville, Ky., has been granted a straight 7-cent fare. The new rate became effective on Feb. 1. Tokens, which were sold at five for 30 cents, are being accepted as the equivalent of 6 cents, when an additional cent is added, this provision having been made to facilitate matters in the interest of the car riders. The old rate was 6 cents on tickets or 7 cents cash. Instead of tokens, paper tickets will be issued.

City Attorney William T. Baskett issued a statement to the effect that the added revenue will probably increase earnings of the company from $300,000 to $500,000 annually.

Under the ordinance passed in 1923, authority for the raise was granted the railway, members of the Board of Works said, after it had been shown that the barometer fund had dropped to $36,000. The question of an increase in fare for the company came up for discussion when the Louisville Railway showed on Dec. 31, 1925, the earliest date a fare increase could be asked for, that the fund had depreciated to such an extent that operation to bring the fund over the $200,000 mark, fixed by ordinance as the minimum, had not been successful.

Bound by the ordinance, the Board of Public Works had only to view the books of the railway, and, if it accepted the figures as kept by the company, the raise automatically went into effect.

The Board of Works objected to certain charges made against the fund and questioned the right of the railway to charge off depreciation and other expenses which, it was claimed, should have been made against capital. On that question several conferences between the board and railway officials hinged.

At the same time accountants for the Public Utilities Bureau had other figures which they claimed would bring the barometer fund to $175,000 with certain items carried off, and even held that under certain bookkeeping interpretations of the ordinance the fund would exceed $200,000.

The question of the general plan to be followed by the company in making charges against the fund has been a subject of debate between the city and the company.

In the event the barometer fund reaches $500,000 fares are reduced automatically by progressive stages.

Mayor of Tacoma Charged with Double Dealing

Internal disturbance in jitney bus circles at Tacoma, Wash., has come to an open rupture between Mayor A. V. Fawcett and George F. Vandeveer, Seattle, attorney and heavy stockholder of the Puget Transportation Company. Mr. Vandeveer accused the Mayor of playing politics with the jitneys and sacrificing the stockholders to further his own political interests. The Mayor branded these charges as false.

Incensed at the Mayor's statements, Mr. Vandeveer threw open the books of the company to show that the buses were operating at a loss. In fact, operation has failed to show a profit for a single month since the company was organized, a year ago last October. He denied, however, that he had threatened to suspend operation. According to Mr. Vandeveer, the company will continue to operate in the hope that it will be able to establish itself on a paying basis. In the future the Mayor will have no voice in the policy of the company. The buses are operated in Tacoma in competition with the railway lines of the Tacoma Railway & Power Company.

During the controversy the Mayor is reported to have said he "could close out the Tacoma Railway & Power Company tomorrow if I want to. But I can't until I find something to take its place. With 100 buses I can do everything the railway is doing, and run the buses further out."

Paving Relief Bill Introduced in New Jersey

Senator Abell has introduced into the Legislature of New Jersey a bill which would relieve street railways from paving expense except that incurred in construction or repair of tracks. The bill is favored by Public Service Railway.

Belated Moves Being Made at Chicago

Members of the local transportation committee of the City Council at Chicago hope to submit a tangible plan for the solution of Chicago's traction problem to the voters in the November election.

Whether the plan to be submitted will be based on a 50-year franchise to the surface lines at the expiration of the existing franchise on Feb. 1, 1927, or whether the plan will be so arranged as to provide the issuance by the city of terminable permits to the companies has yet to be determined by the committee.

If the voters approve the plan, it will be submitted to the Legislature, which meets early in January, 1927, for the needed enabling legislation, on which, in either case, the plan will be based. Between the time that the Legislature convenes and the date of the expiration of the railway franchises there are a few days during which the passage of the enabling measure may occur.

While Alderman McDonough, chairman of the local transportation committee, was discussing the probability of a tangible plan for submission to a vote in November, bankers representing the bondholders of the surface lines were announcing the personnel of the protective committees appointed to conserve the interests of the bondholders. Mr. McDonough said:

> Inside of a few weeks we will have something tangible to work on—a rough draft of a traction ordinance being prepared by C. M. Doty and J. J. Coughlin, assistant corporation counsels, assigned to the committee.
>
> If necessary the committee will meet every other day to consider this rough draft and work out a final solution to the problem. Whether the solution is going to be based on a city-issued permit or on a 50-year franchise will have to be decided by the committee. The committee, however, will have an ordinance ready for submission to the people at the November election, and based on the necessary enabling legislation, which is needed whether we have a 50-year franchise or the permit plan.
>
> When Chicagoans approve this plan, we will submit it to the Legislature as an expression of the majority of Chicago's population and demand that the enabling legislation on which this plan is to be contingent be passed. This could be done before the ordinances expire on April 1, 1927, and in this way a receivership will be avoided.

So far as the general public is concerned the reported action by the bankers caused some misgivings. Largely on this account the bankers explained publicly that the appointment of bondholders' committees at this time was merely a matter of form and in preparation for the future. Until the payment of principal is actually defaulted, an event which cannot happen before Feb. 1, 1927, the bondholders cannot do anything. The personnel of the committees has been published before in the ELECTRIC RAILWAY JOURNAL.

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Purchase of Taxis Is in Hands of Public Service Commission

Coleman J. Joyce, counsel for the Philadelphia Rapid Transit Company, Philadelphia, Pa., has petitioned the Public Service Commission for approval of the purchase of the capital stock of the Yellow Cab Company, Philadelphia. The price specified is approximately $3,000,000. It is stated in the petition that this move is a part of the general program of bringing together the various transportation facilities of the city for the greatest good of the largest number of people. The railway regards a combination of this kind as an economic necessity.

The taxicab company's capital stock is represented by 5,000 shares and the price agreed upon covers several pieces of real estate which it owns. The sum of $50,000 was paid by the P. R. T. at the time that the agreement of sale was made and the balance must be paid not later than July 1, 1926. A hearing will be fixed by the commission.

Plans Made for Great Northern Cascade Electrification

At Boston, Mass., which he visited during the week ended Jan. 30 to discuss matters related to the development of the Northwest and the forthcoming electrification of a new Cascade mountain tangent tunnel with Jackson & Moreland, consulting engineers, Ralph Budd, president of the Great Northern Railway, stated that the new tunnel will be about 7½ miles long. It is expected it will be completed in about three years. It will cost about $10,000,000. More than 18 miles of grades and curves will be eliminated. This will permit a reduction of several hours in the running time of trains. Hydro-electric power from the road's existing plant will be used.

In connection with this tunnel the improvement in line will call for the electrification of about 25 miles of track. Single-phase transmission and the use of d.c. motors in driving the locomotives is contemplated.

Service Changes on Detroit Lines

The fare by railway to the village of Redford, which was recently annexed to the city of Detroit, has been fixed at 12 cents, or double the regular city fare, and a contract has been entered into whereby the Detroit Department of Street Railways is to use the tracks of the Detroit United Railway to the center of the old village of Redford.

Effective on Jan. 17 the Grand River car line was extended from Meyers Road, the old terminal, to Redford Center. The fare is 6 cents for the ride from the city points to Mill Road and 6 cents from Mill Road to Redford. Full transfer privileges are granted.

Coaches formerly operated on Grand River Avenue between Meyers Road and Mill Road have been discontinued and D.S.R. coaches are operated on Grand River Avenue from Redford Center to the Telegraph Road. As the bus fare is 10 cents, this arrangement allows passengers to travel from the Telegraph Road into the city for 22 cents. It has also been announced that bus service is to be furnished from Brightmoor to Mill Road for 10 cents, giving residents of Brightmoor the same privileges as those of Redford.

According to the terms of the contract with the Detroit United Railway, the city department will pay the D.U.R. 10 cents per car-mile for each car operated over its tracks leading to Redford. The contract can be terminated upon 90 days' notice.

Hearing on Los Angeles Terminal Adjourned

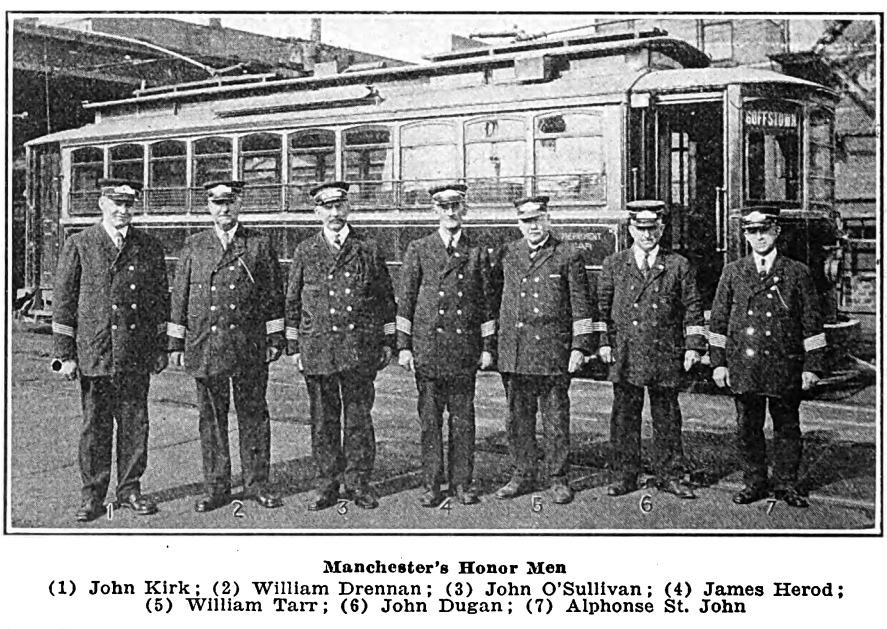
The hearing on the application of the city of Los Angeles for an order of the Railroad Commission to compel steam roads in Los Angeles to construct the Plaza Union Passenger Terminal has been adjourned until March 2 to permit several different associations to present additional briefs and data. A hearing was held in Los Angeles before the California Railroad Commission on Jan. 4 and continued several days, but nothing of significance developed. At this rehearing the city of Los Angeles based its appeal on the decision handed down some time ago by the Interstate Commerce Commission that the Southern Pacific, Union Pacific and Santa Fé lines should provide a union station for Los Angeles. This plan as proposed by the city called for the separation of several dangerous grade crossings that existed on the steam road and interurban lines entering the city. The steam road and electric lines in opposing the Interstate Commerce Commission's views on a union station have presented plans for a system of station facilities, elevated lines and grade crossing separations that is considered the logical solution to the congestion in certain sections.

One-Man Cars to Speed Up Service.—An experiment with one-man cars on the Dorr Street line of the Community Traction Company, Toledo, started on Jan. 17. The purpose is to speed up downtown operation by establishing a new plan of pay-enter inbound and pay-leave outbound. This will eliminate collection of fares in the congested area. The one-man cars have been operating on three other lines for many months.

206 Years of Safety Is Record of Seven Manchester Motormen

In the employ of the Manchester Street Railway, Manchester, N. H., are seven motormen who have established a remarkable record of 206 years of active service in the employ of the company without having been involved in an accident which resulted in any expense to the company. In this period of 206 years these men have operated their cars approximately 5,000,000 miles, or 200 times around the world. This record is a source of great pride.

William Tarr, the oldest in length of service, started work for the company on Feb. 19, 1886, is a veteran of the horse-drawn car days and has 39 years of service to his credit. James Herod is second in years of service. He began work with the company on April 1, 1892, and has 33 years to his credit. William Drennan started to work on July 1, 1893, and has more than 32 years to his credit. Both Mr. Drennan and Mr. Herod are veterans of the old horse-car days. John O'Sullivan began work 28 years ago on April 1, 1897, and Alphonse St. John started one year later, on April 1, 1898. John L. Dugan started 24 years ago on July 5, 1901, and John Kirk 23 years ago on May 1, 1902.



Manchester's Honor Men
(1) John Kirk; (2) William Drennan; (3) John O'Sullivan; (4) James Herod; (5) William Tarr; (6) John Dugan; (7) Alphonse St. John

When asked to comment upon this wonderful record, Thomas H. Kendrigan, superintendent of the Manchester Street Railway, pointed out that in his opinion the showing is due to the fact that all of these men are of a type which any community would be proud to number among its citizens. They have always lived up to the standards of the company. He said:

> I have no recollection that any of these men was ever late for work. If I were asked to name the principal qualifications that go to make up a good motorman, I would name loyalty, co-operation and courtesy. All of these traits are characteristic of these men. I have never known one of them to be disagreeable to the public, or indifferent to the orders of the company. They have tutored practically all student operators on our lines within the last twenty years. By their devotion to their duties they have earned the respect of the officials of their company, and by the courteous and efficient manner in which they have conducted their daily work they have earned the trust and confidence of the public.

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Rapid Transit Plan for Immediate Use Suggested at Detroit

The plan for "rapid transit" operation of street cars on main traffic arteries in Detroit, Mich., which was submitted to the City Council by Harry R. Miller and Nicholas J. Schorn, Detroit real estate men and engineers, has been referred by that body to the Department of Street Railways and the Rapid Transit Commission for study. The D. S. R. and Rapid Transit Commission were directed to report to the Council at the end of four weeks as to the possibilities of the proposed plan.

As has been explained previously in the ELECTRIC RAILWAY JOURNAL, the plan, known locally as the Miller-Schorn plan, was originally presented to the Council last year. Included in it are the following recommendations:

1. That four-track subways be built within the half-mile circle, designed for extension when the need arises.
2. That street cars can be operated as express trains outside this district, making stops every half mile or mile at depots placed in the center of the street, between the tracks, and reached from the sidewalks by underground passages.
3. That buses supplant the trolley cars in the slower, many-stop service.

The plan is advanced by its originators as the most practical and economical one for rapid transit offered in Detroit. They urge that recommendations 2 and 3 be put into effect without delay.

In commenting on the plan, H. U. Wallace, general manager of the D. S. R., stated that tests mentioned in the reports submitted by the plan's proponents, indicating a saving of more than twenty minutes by the use of the Miller-Schorn system on the Woodward Avenue line between Jefferson Avenue and the city limits, were made after midnight when traffic was light and that they might therefore be inaccurate.

Mr. Mitten Would Reorganize Labor Bank

An offer of $1,000,000 for the rehabilitation of the Producers and Consumers Bank, Philadelphia, Pa., a labor institution, which closed its doors some months ago, has been made by Thomas E. Mitten, chairman of the Philadelphia Rapid Transit Company. The offer was accompanied by a comprehensive plan for reorganization, in which the interests of the stockholders and depositors would be fully protected. Albert M. Greenfield, receiver, favored acceptance of the plan, through which, it was said, losses to depositors sustained in the failure would be eventually recovered.

Employees at Detroit Protest Change in Hours

Although not entirely satisfied with the new arrangement of working hours at the Highland Park shops of the Detroit Department of Street Railways, the 500 employees who walked out at noon on Saturday, Jan. 23, were back at work again Monday morning.

Some time ago the men, who were not entirely satisfied with the wage scale, asked an increase in wages. After a survey of factory conditions in Detroit by Frank J. Denny, assistant to H. U. Wallace, general manager, it was reported that the men were receiving a good hourly wage rate, but that they were working only 44 hours a week, whereas employees in factories on similar lines of work were employed 48 to 49 hours a week.

Following the findings of Mr. Denny, the general manager ordered that the men in the Highland Park shops be permitted to work on Saturday afternoon, thus increasing the number of hours per week to 48, the additional hours to be paid for at standard rates.

The department manager does not contemplate any alteration of the wage scale and apparently no further step is planned by the shop men.

Oklahoma Railway Affected by Withdrawal of Jitney Rules

The transportation situation at Oklahoma City, Okla., was somewhat muddled Jan. 27 when city officers were ordered to discontinue enforcement of the ordinance governing bus operation in a restraining order issued by Judge Tom Chambers of the district court. This court order resulted from a suit filed against the City Commissioners by the People's Transfer Company, in which it was alleged that the Oklahoma City bus and jitney ordinance is "unreasonable, discriminatory and oppressive." Acting upon the strength of a previous decision upholding the ordinance the railway put on several buses to supplement its street car service.

The temporary restraining order threw down the bars for the establishment of jitneys on several Oklahoma City streets which are operating in competition with the Oklahoma Railway. This complicates the financial problem which the Oklahoma Railway has been facing since it went into receivership more than a year ago. The Oklahoma City ordinance, the enforcement of which is temporarily restrained, requires bus operators to pay an annual license of $30 per seat on every bus. It also gives City Commissioners the right to specify the routes of bus lines and fixes a penalty of $19 and cost for violation. Each violation counts as a separate offense, according to the ordinance.

A City Commissioner Sets a Good Example

Herman H. Green of the City Commission of Salt Lake City, Utah, in carrying out a plan announced by himself some weeks ago, has turned his commissioner's automobile in to the city garage. Commissioner Green is riding the street car to and from his office, and walks when it is necessary to go about town on city business. Mr. Green has taken this action in the interest of economy and reduction in automobile expense for the city. The commissioner's idea is that just enough cars to take care of the actual needs of the city should be kept for emergency business.

Accident Prevention Contest in Rochester

An accident prevention contest has been started by the New York State Railways, with the various divisions, lines, teams and individual trainmen of the Rochester city lines. Rewards will be given to winners and to all men operating 300 days without a chargeable accident.

The plan is to divide all motormen and conductors into teams of ten men each. The same percentage of extra men will be on each team. Teams will be picked so they will operate as near as possible an equal number of car-miles. Each member of the winning team having the fewest number of accidents during the year will be presented with a new uniform as a reward for his carefulness. Each motorman and conductor who operates his car for 300 days without a chargeable accident will be presented with a $1,000 sick and accident insurance policy, good for one year. All accident records will be posted on the various bulletin boards in the carhouses, and banners or flags, which can be displayed in front of the carhouses, will be presented the first day of each month to the division operating the largest total of car-miles per accident during the preceding month. The contest will last throughout the year.

Name of Stone Mountain Cars to Commemorate Leading Men

Each of the five new interurban cars which will be operated on the Stone Mountain line by the Georgia Railway & Power Company, Atlanta, Ga., will bear the name of some distinguished citizen of the community.

The suggestion about naming the cars came from a patron of the line. It was eagerly adopted by officials of the company. Patrons along the Stone Mountain interurban have been asked to send into the company the name of some person after whom they would like to have a car named along with their reasons. The names are to be limited to those who have served the community and whose careers are now ended. The five persons receiving the highest number of votes in the contest will have their names placed upon the first five new cars. Other cars will be named as they are purchased and placed in commission.

Thirty-eight Years in Service

This coming spring Ellsworth E. Rhodes will celebrate 38 years of continuous service with the Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y. In the days when that company kept about 60 horses in readiness for service a young man who hailed from Clintondale became the driver of an old green car which left the carhouse and ran to the river, then back to the Poughkeepsie & Eastern Railroad. This man, now grown old in the service, recently spoke of his experiences with Mike, the utility horse; of the one-man car, not, in this veteran's opinion, an innovation, and the arrangements made with Vassar College girls to meet the "Mary Powell," bound for New York.

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Survey at Springfield Progressing

The survey of the lines of the Springfield Street Railway, Springfield, Mass., by the committee of three is progressing rapidly. The committee consists of Engineer J. T. B. Woodruff of the Springfield, Mass., planning board; President Clark V. Wood of the Springfield and the Worcester street railways and W. J. Flickinger, vice-president of the Connecticut Company.

To date the committee has the report of J. T. B. Woodruff. The paper reviews the problem of traffic control as it affects the operation of street cars, routing of cars, overcrowding of cars, track repairs and renewals, the elimination of unnecessary stops and the desirability of extending parts of the double-track system.

It is said that Mr. Woodruff recommends the repair and removal of a large part of the system and that he suggests a plausible solution for traffic control. Only the cars operated over the Longmeadow line are said to be so antiquated as to need to be replaced. This is a matter which is receiving the attention of the committee. A new standard car which is said to be favored is lighter of weight and lower of body than is the type in use at present. A model one-man, two-man car is being built by the Wason Manufacturing Company.

Expenditure needed to rehabilitate the system is placed at about $1,000,000.

Quincy & Northeastern Receives Certificate

It is reported that the Quincy & Northeastern Railway, Quincy, Ill., has been granted a certificate of convenience and necessity to operate a line between Quincy and Monmouth, Ill. It is generally believed that the Quincy & Northeastern will be operated with electricity supplied from the Keokuk, Iowa, power dam. No right-of-way has been secured, but a preliminary survey has been made. Efforts to reach Charles H. Petsch, New York City, said to be president of the new line, were unavailing as Mr. Petsch was out of the city.

Commission Recommended for Newark

The creation of a Transit Commission in Newark, N. J., to consist of five representative citizens to serve without pay and have the help of an expert on traffic and transportation as consultant is favored by the Newark Chamber of Commerce. This action, taken at the regular meeting, expressed the approval of the Chamber on the report by a special committee on traffic, transit and transportation. After reciting the results of an extensive survey the committee suggested in its report that the commission be appointed by the Mayor with the authorization of the City Commission or the Legislature, and that the city appropriate $60,000 for the commission's work. Mayor Raymond said he did not believe that the City Commission should delegate its power to a transit commission because the responsibility for what is done would rest eventually with the city officials.

News Notes

Rate Rehearing Denied.—The California Railroad Commission has denied a petition for a rehearing filed by the city of Oakland in the matter of the temporary increase in rates of the Southern Pacific Company for its transbay ferry and interurban electric railway service in Alameda County.

Fare Rehearing Sought.—The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for a rehearing of its application for an increase of its local railway and bus fares in the city of Pasadena. Its application was denied recently by the Railroad Commission.

Radio Tells of Seattle's Service.—The Seattle Municipal Railway recently utilized the radio in Seattle, Wash., to advertise its service. An elaborate program of music, singing and talks was arranged by R. E. Furse, assistant to the general superintendent. Included in the program was a talk on "Operation of Seattle Municipal Railway," by D. W. Henderson, general superintendent.

Committee Opposes Increase in Speed Limit.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been refused permission to increase the speed of its street cars from 15 m.p.h. to 20 m.p.h. by the public utilities committee of the Common Council. The committee felt that it would be unfair to grant this privilege to the railway when the speed of autos, buses and taxis is held by ordinance to 15 m.p.h.

Fare Increase Denied.—The Public Service Commission of West Virginia on Jan. 27 denied the increase in rates asked by the Wheeling Traction Company, Wheeling, W. Va. The commission held that the company did not present its case in a manner which would enable the commission to distinguish properly the interstate and intrastate business and therefore an additional charge could not be authorized. It was held by the commission that no competent evidence had been adduced by the railway to enable the commission to fix the present fair value of the company's lines and properties.

$15,660 Safety Bonus Awarded.—The San Diego Electric Railway, San Diego, Cal., distributed at two meetings on Dec. 22 and 23, 1925, $15,660 in safety-first bonus checks to 172 conductors, motormen and bus operators. In addition to the safety-first bonus, during 1925 an additional bonus amounting to $7,079 was distributed to trainmen under a plan wherein it is possible for each trainman to earn $5 a month as an award for courtesy, safety, neat appearance, accuracy and general efficiency. At a meeting the subject of the benefits of the third year of welfare work carried on by the company were discussed, and in addition Hamilton watches were awarded to two employees for twenty years of faithful service. Both were elected to membership in the twenty-year service club.

Transfer Charge in Mobile.—At a recent meeting of the Alabama Public Service Commission, held at Montgomery, Ala., permission was granted to the Mobile Light & Railroad Company for a 1-cent transfer charge where through street cars are transferred from one line to another and the passenger does not change cars. This change does not increase the present fare, but is in lieu of the existing traffic charge where passengers change cars. The railway company wanted the change in order to put on through cars to carry students to the new Mobile high school.

No Strike in New Orleans.—There will be no car strike in New Orleans, La. The vote cast in a recent referendum was 823 against and 697 for. The possibility of a strike came about through the dismissal of two conductors on the lines of the New Orleans Public Service, Inc. Oscar C. Pertuit was discharged, it was said, for circulating election propaganda during the recent contest for president of the union and Robert Martin for inciting the men against the company. Herbert B. Flowers, president of the New Orleans Public Service, Inc., said that representatives of the union had called upon him and asked that the two men be reinstated, but that he had said that the men had been dismissed in keeping with the agreement between the union and the company.

Fares Between Wellston and St. Charles Cut.—The Missouri Public Service Commission on Jan. 25 authorized the Missouri Electric Railroad, controlled by the United Railways, St. Louis, Mo., to place a schedule of reduced fares into effect between Wellston and St. Charles, Mo., effective on Feb. 1. Under the new order the fare will be 21 cents. The new rate means a saving of 10 cents for through trip riders due to a change in the zones on the line. The fare in each zone will be 7 cents or a token for each adult and 3 cents cash for children. The reduction was sought to meet bus competition. The private buses running from Wellston to St. Charles recently cut their fares below those charged by the street cars. The competition in this section was referred to in the ELECTRIC RAILWAY JOURNAL previously.

New Long Beach Line Opened.—The new Daisy Avenue freight line of the Pacific Electric Railway, Los Angeles, Cal., was recently dedicated to the development of the Long Beach Harbor. More than 600 acres of new Long Beach industrial territory will be opened up in the west side district. The line cost the railway $237,000. It will develop territory that now lacks rail facilities and will shorten the freight operating haul to and from Long Beach and Los Angeles, 2.3 miles. Mayor Clark of Long Beach said that the construction of the new line showed the unbounded faith the Pacific Electric had in the future of Long Beach Harbor. The new freight line extends northerly along Daisy Avenue from State Street to a point of juncture with the Los Angeles-Long Beach main line at Los Cerritos. It is estimated that freight can be moved to and from Los Angeles over the new line in 90 minutes.

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Recent Bus Developments

New York Commission on Buses

State Body with Jurisdiction Outside of New York City Cites Its Views

It seems apparent to the Public Service Commission of New York that the substitution of buses for electric railway lines which have ceased to be profitable or that operate in territories which may better be served by buses is inevitable. With the continued growth in the amount of business carried on by bus lines in the state, the commission sees the need for further authority for the regulation of these agencies. In the opinion of the commission there should be added to the present public service commission law an article specifying in detail the supervision which the Legislature desires the commission to exercise over bus lines. It says the necessity for legislation upon this subject is recognized not only by the commission and the general public but also by the operators of bus lines.

Two other recommendations upon this subject contained in the last annual report of the commission are renewed, namely, an amendment to Sec. 5 of the public service commission law specifying more in detail the authority of the Public Service Commission and the Transit Commission where a bus line is partly within and partly without the territorial limits of the city of New York, and an amendment of the railroad law which will permit street railways to engage in auxiliary bus business without the necessity of the formation of separate corporations for that purpose.

The commission sees the bus business gradually unfolding itself. It says that in the early development of the bus no attempt was made to co-ordinate lines. They were developed and operated as the immediate needs dictated and as the financial ability of the operator permitted. Too often the available capital was so slender that the equipment soon suffered from inadequate maintenance and in many instances the original operator disappeared, to be followed by an equally enthusiastic and poorly equipped successor. The past year, however, has presented a rather wholesome consolidation of a number of such lines into systems extending over wide areas, back of which there are adequate financial resources to permit the lines to be efficiently and successfully operated. The close of the year finds these lines just beginning to function at their best. In the next season there is every reason to believe there will be a further consolidation with wider extensions which will ultimately provide the state with a class of service of the first order.

At one place in its comment the commission says:

> Within the state bus operation has superseded electric railways in Newburgh (except partially for a short period in the summer when passengers are transported to Orange Lake Park), in Middletown, in Glen Cove and in Port Jervis. In Albany, Troy, Utica, Rochester, Buffalo, Auburn and Watertown electric railway service has been superseded in part by bus service, either through extension of lines or creation of new lines.

Service to University Supplied by Baton Rouge Company

More than an ordinary public service is being supplied by the Baton Rouge Electric Company to the new Louisiana State University in Baton Rouge, La. The route is 2.6 miles long, of which 2.43 miles is over a hard-surfaced highway. Service by bus was started immediately upon the completion of the paving work on the Highland Road about three months ago.

The bus equipment consists of three 29-passenger Mack-Birney safety buses, two of which are in service from 6 a.m. to 8 p.m. on weekdays, while the third is used in tripper service between 7 a.m. and 8 a.m. and 11:30 a.m. and 1:30 p.m. On Sundays, when no students are handled, one bus furnishes a 30-minute headway, whereas a ten to fifteen minute headway is furnished on weekdays. The bus equipment represents an investment of about $9,000 for each vehicle. Costs approximate 16 cents per bus-mile. Licenses and taxes average yearly about $200 per bus.

During November the company handled 24,700 passengers. About 25 per cent of these were hauled between 7 a.m. and 8 a.m. during the rush for 8 o'clock classes.

The railway fare in Baton Rouge is 5 cents, but the bus fare is 10 cents including transfer privilege. Transfers from street cars are honored on the buses upon the payment of an additional 5 cents in cash. Transfers are issued from buses to street cars without additional charge.

The Louisiana State University has outgrown its accommodations in the heart of town. It was recently moved to a new site just outside the city limits. The new development contemplates an ultimate outlay of $7,000,000. More than 1,600 students are enrolled. At present all students live downtown, pending the completion of the dormitories.

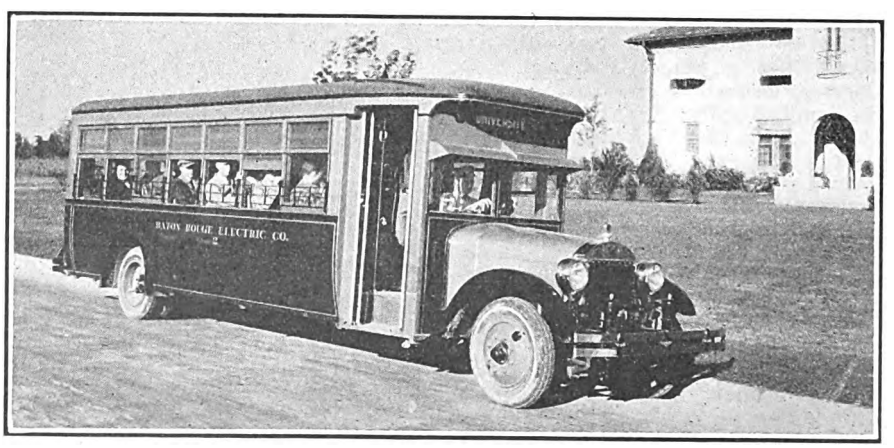
De Luxe Bus Service Proposed for North Jersey

Proposals have been made by the Public Service Transportation Company to establish de luxe bus service through certain high-class residential districts in North Jersey. The plan contemplates operation of parlor car buses providing a seat for every passenger at a fare higher than that of the street car. One of the districts which it is proposed to serve in this manner is the Forest Hill section of Newark, lying between the Mount Prospect Avenue car line and Branch Brook Park. A considerable part of this district is several blocks away from present service of the Public Service Railway. Some years ago bus service was attempted by an independent company operating at a 10-cent fare. The schedule speed was comparatively slow, however, and the service never achieved any great degree of popularity. Objection was made by some of the residents to the noise created by the buses. After some months trial this service was discontinued.

Another proposed line would serve the northern section of Glen Ridge, a suburb of Newark. A large residential district has been built up some distance from the nearest car line and it is proposed to furnish direct service between this district and the downtown section of Newark.

Limitations to Bus Operation.—The Gardner-Templeton Street Railway is operating buses between West Gardner Square and the Templeton town line, but is not permitted to pick up passengers bound for West Gardner or for Baldwinville, Mass. This restriction protects a private line which operates between Gardner and Winchendon.

Twelfth Line Started.—The twelfth bus line installed by the Philadelphia Rapid Transit Company, Philadelphia, Pa., within the last year started its first bus on Jan. 31 connecting Frankford, Olney, East Germantown and Chestnut Hill. During rush hours buses will run at intervals of two or three minutes, with a ten to fifteen minute schedule during the early hours of the day and a late night schedule of 22 minutes. The new line will provide a crosstown service for workers and students. A 10-cent fare with the 3-cent exchange privilege to and from all connecting surface lines is charged.



Students en Route to University

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Buses for Light Hours.—The Public Utilities Commission has approved the petition of the Connecticut Company to discontinue railway service in Bridgeport, Conn., for a total distance of ½ mile except that at specific times service will be supplied over part of this route. The company will operate buses during the hours of off-peak traffic.

Seeks to Operate in Millbury.—Officials of the Worcester Consolidated Street Railway have asked the selectmen of Millbury, Mass., for permission to operate buses within the town limits. Bus concerns which asked for permits were turned down because the Selectmen felt the railway should be given first consideration. The railway is operating two buses to serve the Speedway and Tatnuck Square districts in that city. Both sections have been without transportation facilities. The regular 10-cent fare is being charged. Passengers are permitted to transfer between bus and trolley.

Refuses Bus Substitution.—The Alabama Public Service Commission on Jan. 27 denied a petition of the Alabama Power Company to abandon a portion of its car tracks in Montgomery and substitute a bus line. In denying the petition the commission established a policy of declining to entertain such petitions until the municipal authorities have expressed their opinion. The Alabama Power Company sought to make the change as a measure of economy, but the citizens protested. The company failed to get a statement from the City Commission and then resorted to the Public Service Commission.

Enlarges Service.—The East St. Louis & Suburban Railway, East St. Louis, Ill., through its affiliated company, the Red Line Company, has extended its bus service into St. Louis from Collinsville, Ill. The new service will be from St. Louis to Greenville, Ill. The buses formerly operated only between Greenville and Collinsville. Two 29-passenger buses are being used in the service.

Purchases Independent's Rights.—Unable to secure authority from the Indiana Public Service Commission to operate a bus line between Hammond and Indiana Harbor, Ind., because of the existence of one line in that field, the Gary Railways took another step in the unification of northern Indiana bus routes by purchasing the certificate of the Blue Safety Coach Company of Indiana Harbor to operate between the two points.

Line in Pennsylvania Acquired.—The West Chester Street Railway, West Chester, Pa., which owns and operates the unified railway and bus system known as the Chester Valley Lines, has acquired the bus line between Pottstown and Reading from the Reading & Pottstown Bus Company, which will be operated as part of this system. The consolidation will enable the Chester Valley Lines to provide direct bus service from Reading to Norristown and from Wilmington, Del., to Reading, through West Chester and Pottstown. The extent of the use of the bus by this company has been the subject of review before in the ELECTRIC RAILWAY JOURNAL.

Financial and Corporate

Cincinnati Results Promising

First Two Months Under New Service-at-Cost Grant Show Small Balance—President Draper Discusses Buses

After all expenses, rental, interest and return on capital the Cincinnati Street Railway, Cincinnati, Ohio, earned $6,774 for the two months period ended Dec. 31, 1925. This fact was disclosed in the report by President Draper, which reviewed operations since the company took over the operation of the street railway system from the Cincinnati Traction Company on Nov. 1 last. Mr. Draper said that having in mind that the essence of a service-at-cost franchise was that only a sufficient revenue could be secured to pay the operating cost, taxes, fixed charges and return on capital, it was apparent from the results obtained in the two months his company had been operating that the 8⅓-cent fare provided sufficient revenue to meet these requirements and a small surplus in addition. The report for the two months shows the following result:

	November and December
Operating revenue	$1,239,313
Operating expenses	847,858
Net operating revenue	391,455
Taxes	123,369
Operating income	268,085
Non-operating income	2,956
Gross income	271,042
Rental, interest and return on capital	264,268
Balance	$6,774
Total revenue passengers carried	14,446,892

Mr. Draper referred to the increase that occurred in the number of revenue passengers carried compared with the period that preceded the beginning of operation by his company on Nov. 1 at the reduced rate of fare. The number riding in the last two months of 1924 under the old plan and at the higher rate of fare averaged 6,879,025, while the number of revenue passengers riding in the last two months of 1925 under the new operations was 7,223,446. It was the hope of the officials, Mr. Draper said, that they may so operate the railway as to be able to continue the lower fare charges.

On the matter of bus transportation Mr. Draper said that the city authorities have under consideration his company's application for four bus lines from the center of the city to outlying suburbs, two crosstown bus lines and two connecting or feeder lines. It was the opinion of the company's officials that the public could be best served by a unified transportation system. The lines now proposed to be operated by the company formed the nucleus of a bus system to be developed as needs require and routes have been selected with a view toward their permanent operation rather than with the idea of competing with existing rail or bus lines.

Five new directors were added to the board of the Cincinnati Street Railway at the recent meeting of the stockholders. The new directors were: James M. Hutton, president of the Cincinnati Chamber of Commerce; Attorney John B. Hollister, Albert Benham, vice-president of the company; J. B. Stewart Jr., general manager, and C. V. Link, treasurer.

Passenger Traffic on Increase—Figures of Fares and Wages

Passenger traffic on electric railways continued to increase during December, 1925, compared with December, 1924, although at a somewhat retarded rate. This retarding of the rate of increase is undoubtedly due in part, according to the American Electric Railway Association, to the unusually heavy traffic carried in December, 1924, when there was a very sharp increase over November. The number of passengers reported by 209 companies for December, 1925, and 1924 was as follows:

December, 1925	839,574,559
December, 1924	827,894,938
Increase, per cent	1.39

For the calendar year 1925 compared with 1924 the number of passengers carried by these companies is as follows:

1925	9,395,058,568
1924	9,433,386,205
Decrease, per cent	0.41

Average cash fares (in cents) in 272 cities of 25,000 population and over:

Jan. 1, 1926	Dec. 1, 1925	Jan. 1, 1925
7.6066	7.5882	7.4926

Average maximum hourly rates (in cents) paid motormen and conductors in two-man service by companies operating 100 or more miles of single track.

	Jan. 1, 1926	Dec. 1, 1925	Jan. 1, 1925
Average hourly rate	56.30	56.30	55.87
Index No. (1913 = 100 per cent)	206.61	206.61	205.03

Merger Move Under Way in Indiana

Samuel Insull and Randal Morgan have approved a plan under which Halsey, Stuart & Company, as readjustment managers, will propose to the security holders of the Central Indiana Power Company and its subsidiaries and to the Terre Haute, Indianapolis & Eastern Traction Company and certain subsidiaries a readjustment of their securities so as to enable the consolidation of these properties into the Indiana Electric Corporation. This will bring the electric light, power and traction business of central northwest Indiana under one large operating company with ample financial and physical resources to provide the best electric light, power and traction services at the most reasonable rates consistent with

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the interests of the company and the public to that part of Indiana.

The common stock of the Indianapolis Street Railway, which operates the street railways in Indianapolis, is owned by the Terre Haute, Indianapolis & Eastern Traction Company, but it is not intended to include the street railway in the merger, not at this time at least. Both Mr. Insull and Robert I. Todd, president of the Indianapolis Street Railway, are quoted to this effect.

The purpose of the deal is to provide for an adequate and constant supply of electrical energy to meet the anticipated future demands, to improve the service to the public and to eliminate the intricate financial structures brought about during the growth of the properties by the creation of numerous corporations, associated through ownership or control of stock or otherwise, and to furnish a satisfactory basis for the future financing which the development of the territory will require.

For a number of years Indianapolis has been handicapped by the lack of power with which to move cars when the peak loads were encountered. The need is for a central supply station of greater capacity than exists now on the properties of either the Indianapolis Street Railway or the Terre Haute, Indianapolis & Eastern Traction Company.

As indicated in the ELECTRIC RAILWAY JOURNAL for Jan. 30, Mr. Insull was reported to have said that the interests he represented were not going into the consolidation primarily from the traction point of view, but that with their traction lines in northern Indiana and the Interstate Public Service Company's line from Indianapolis to Louisville, closer traction relations were certain, with through interurban service at high speed possible from Chicago to Louisville.

Suburban Line May Go to Cincinnati Railway

The last link in the unification of the electric railway system at Cincinnati, Ohio, by the Cincinnati Street Railway will be accomplished if the stockholders of the Cincinnati & Hamilton Traction Company approve the plans set forth in a letter mailed to them. The letter is signed by Samuel Assur, president of the Cincinnati & Hamilton Traction Company. It states that the Cincinnati Street Railway has agreed to give 20,000 shares of street railway stock for the properties. The approval of this plan was recommended by the directors of the Cincinnati & Hamilton Traction Company, after a committee representing the common and preferred stock holders had devised a plan of distribution to the shareholders. Stockholders of the company are to meet March 4 to discuss the offer.

The plan calls for the distribution of 80 per cent of the Cincinnati Street Railway stock or 16,000 shares to the preferred stock holders. The remainder will go to the common stock holders. The time limit for acceptance of the offer is March 31. The present plans call for the transfer of the properties to the purchasing company on April 1. If the stockholders approve the plans the Cincinnati & Hamilton Traction Company will be liquidated.

The letter to the stockholders is as follows:

> The franchises held by your company in the villages of Wyoming, Lockland and Glendale have expired and despite negotiations with said villages by officers of your company and officers of the Ohio Traction Company and the Cincinnati Street Railway said franchises have not been renewed on a basis acceptable to this company or to your lessee, the Cincinnati Street Railway.
>
> Under the lease from your company to the Ohio Traction Company, which was assigned to the Cincinnati Street Railway, on Nov. 1, 1925, the Cincinnati Street Railway has the right to discontinue operation of your lines and refuse to pay rental in the event of the failure of your company to secure renewals of franchises acceptable to the lessee or which arbitrators may decide should be accepted by your lessee. In the event of the exercise of such right the Cincinnati Street Railway would have the right to demand payment from your company for all improvements and betterments made to your property by your lessee during the term of the operation of your property by the said lessee.

The lease for the operation of the Cincinnati & Hamilton Traction Company's property was assigned to the Ohio Traction Company by the Cincinnati Interurban Company in July, 1905. The lease was taken over by the Cincinnati Street Railway last November along with the other electric railway properties held in Hamilton County by the Ohio Traction Company, which were operated under the name of the Cincinnati Traction Company.

The Cincinnati & Hamilton Traction Company has 36.24 miles of single track. The lines extend from the Zoo to Glendale and Hamilton with a branch at Lockland.

Some Fine Points at Issue

Court to Settle Dividend Payments by Eastern Massachusetts—Public Trustees Praised—Did They or Did They Not Divert Too Much Money to Improvements?

AS MASTER in the suit by L. Sherman Adams against the Eastern Massachusetts Street Railway, in which Mr. Adams claimed $24 back dividends were due to the holders of common stock on each share and $5 due the adjustment stockholders, Judge Frederic H. Chase has filed his final report with the Supreme Judicial Court. This report is not materially changed from the original draft reported last October. It supports the contention that the company has earned enough to pay the dividends. His report sets forth in much detail the financial operations of the company, and the present conditions. It leaves only the question of law unsettled, and that is whether the board of public trustees has the discretionary power to withhold the dividends, to be applied to the upbuilding of the property. On that point the case will go to the full bench for argument in March.

Judge Chase finds that the true surplus was $3,632,450 on Dec. 31, 1922, and $4,343,141 on Dec. 31, 1924; that on Dec. 31, 1922, the liquid assets exceeded capital stock, bonds and obligations representing capital investments by $5,071,564, and that in addition the company then had in its treasury in liquid form a reserve fund of $500,000 applicable to the cost of service and unmatured bonds and equipment notes of the company which it had bought in and held uncanceled in the treasury, amounting to more than $1,600,000, and that on Dec. 31, 1924, it had the same reserve fund of the same amount and unmatured bonds of the company purchased and held in the treasury uncanceled of a par value of $1,981,000, and in addition to these funds it then had liquid assets of $3,597,284, in excess of its capital stock and capital obligations.

In this connection he points out that up to Dec. 31, 1924, the outstanding funded indebtedness of the company had been reduced $6,221,102 by payment and by purchase of bonds and equipment notes.

Judge Chase finds also that there had been expended and charged to operating expense $1,920,835 to Dec. 31, 1922, and at least $2,920,000 to Dec. 31, 1924, which should have been charged to an asset account; that there has been expended to Dec. 31, 1924, for additions and improvements $5,079,249; that the capital expenditures for rehabilitation carried as an asset amounted to $539,044 Dec. 31, 1922; that the total charges to operating expense for accrued depreciation to Dec. 31, 1924, amounted to $4,778,042, and that the balance of the accrued depreciation account carried as a liability Dec. 31, 1924, was $2,432,331; that represented by cash or investments on the asset side of the balance sheet, there was charged to profit and loss for losses on road and equipment retired to Dec. 31, 1924, $275,546, and to operating expense for road and equipment retired over $800,000; that the road and equipment as a whole are much improved in efficiency and earning power over what it was when the trustees received it in 1919, and the value of the property as a whole for operating purposes is greater today than it was in 1919.

Regarding earnings Judge Chase says:

> The operation of the road has yielded enough income to meet proper maintenance and all other operating expenses, pay taxes, rentals, interest on all obligations, dividends on the preferred stock and 6 per cent on the common stock, make adequate allowances for depreciation, obsolescence of property, rehabilitation, and losses in respect to property sold, destroyed and abandoned, and defray all other charges which properly may be made against income or surplus.

He finds that the trustees charged to operating expense expenditures which were described by the company as additions and improvements and which were allowed as such by the Department of Public Utilities, amounting to $63,009, and he disallowed a claim of the trustees that reserve should be held on the liability side of the account to meet an estimated expense of $25,000 "for counting, canceling and burning old bonds," finding that "no claim of this kind has as yet

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been presented, however, and I am unable to see how such a large expense can reasonably be incurred for services of this character. I am allowing, therefore, a reserve of only $1,000 for this purpose."

Judge Chase says that the trustees have always considered that dividends on all classes of stock are included in the cost of service, and that they have been mindful of this in fixing rates of fares. Their contention is, however, that notwithstanding this, the provisions of the act, they have not been able to get enough revenue from fares to enable the company to pay dividends on the common stock. The trustees take the position that their right to apply income to rehabilitation of the road is not limited to depreciation accruing after the new company was incorporated, but includes large depreciation which accrued before that time while the road was being operated by the Bay State Street Railway and by the receiver. The report says:

If the statutes are to be so construed, that the trustees are to operate the property and maintain it at the condition it was in when received, and are not to improve or increase its capital value out of income until they have paid all cost of service, including dividends, then I find that the dividends have been earned. Revenues have been sufficient to cover the full cost of service, as defined in the act, including dividends.

If, however, the statutes are construed to mean that the trustees have discrimination in the matter of declaring and paying dividends and may improve and increase the capital value of the assets of the company before dividends can be said to have been earned, as may directors of ordinary business corporations, the question takes a different aspect, involving consideration not only of the amount of income received, but the disposition made of it for various purposes and its distribution among various accounts.

As to the wisdom of the trustees in their use of the funds the report says:

When the trustees took possession the road was in poor condition in many respects, and no reserve depreciation had been accumulated. Since then, as before stated, the trustees have greatly improved the operating lines and their equipment. They have replaced worn-out rails and ties, improved the rolling stock and other equipment, reduced the cost of operation and increased the efficiency of the system as a whole. The trustees have been, and are, men of integrity and business experience. They have in large measure left questions of policy and active management to their chairman. The chairmen have been individuals of experience and ability who have endeavored to manage the company for its best good as they saw it. Whether they have misconstrued their duty toward the stockholders with respect to dividends seems to be largely a question of law. If this were a business corporation, organized under the general provisions of law, there might be little doubt as to the propriety of their conduct, inasmuch as the company has been honestly managed, its assets prudently conserved, and earnings put back into the property have enhanced its capital values. With this corporation, however, under the provisions of the special act, the questions involved may depend upon different principles.

The report of Judge Chase concludes with the statement:

So far as shown by the evidence, without regard to increase in population of the district served by the company, as to which no testimony was introduced, I find that it is reasonable to believe that the present net return on the property will continue during the period of public control. The road is in excellent condition and seems to be on a basis sufficiently sound to assure, with good management, the continuation of a net revenue substantially equal to the present yield. It is true that the gross earnings show decreases, but the net operating revenue has been stabilized by economies, and has been maintained without great variation since 1921 even with reduction in fares.

Denver Tramway Has $284,790 Net for Six Months

The Denver Tramway Corporation, Denver, Col., successor to the Denver Tramway Company, has published its earnings for the period of six months ended Dec. 31, 1925. The surplus earned, after paying 5 per cent on the preferred stock, was $20,819 applicable to an additional 2 per cent, it being understood, by agreement, that the company will pay 7 per cent if possible. The successor company at Denver stepped in on July 1 so that the report covers the first six months of the corporate life of the new company. The statement follows:

DENVER TRAMWAY EARNINGS FOR SIX MONTHS

Operating revenue	$2,280,929
Operating expense	1,491,165
Operating income	$789,763
Miscellaneous income	30,014
Gross income less operating expenses	$819,778
Deductions for taxes and interest	534,987
Net income	$284,790
Profit and loss charges	3,560
Surplus after profit and loss charges	$281,229
Preferred dividend requirement at 5 per cent	260,410
Surplus after preferred dividend at 5 per cent	$20,819

Suit to Foreclose Hartford & Springfield Issue

Harrison B. Freeman, receiver of the Hartford & Springfield Street Railway, Warehouse Point, Conn., has been made defendant, along with the company, in court proceedings instigated by Ernest E. Rogers looking to foreclosure action against the railway. Mr. Rogers is trustee for the holders of $600,000 of the railway bonds. Action to foreclose was suggested by Judge A. L. Brown so that the railway could be reorganized.

Lucius F. Robinson, counsel for Mr. Rogers, states that the bonds, issued July 1, 1901, have been long overdue and in default. It is further brought out that two-thirds of the holders of these bonds have made demands for foreclosure action. The specific issue of bonds on which the present action is based covers the properties of the company in Enfield, East Windsor and South Windsor. Since these bonds were issued the railway has acquired franchise rights in a number of other towns. Interest on the bonds has not been paid since July 1, 1918.

New Directors Chosen. — John A. Kelley, president of the First Citizens Corporation of Columbus, has been chosen director of the Columbus Railway, Power & Light Company, Columbus, Ohio, in place of Walter B. Beebe, now on a European tour. Edward G. Borer, Philadelphia, has succeeded B. C. Denman, Davenport, Iowa, as a director.

Partial Abandonment Approved. — The Public Service Commission approved on Jan. 29 a declaration of abandonment of the portion of the route of the Binghamton Railway, Binghamton, N. Y., in Johnson City from Floral Avenue to Riverside Drive along Ackley Avenue, Union Street and Burbank Avenue. The resolution was adopted by the directors Dec. 1, 1924, and by the stockholders of the company May 15, 1925. The commission has determined that the operation of this part of the route was no longer necessary for the convenience of the public.

Seattle's Tax Issues Deferred. — Hearing on one phase of the litigation over the 1919 street railway tax between Seattle, Wash., and the Puget Sound Power & Light Company, which was set for Jan. 27, has been postponed until March, Corporation Counsel T. J. L. Kennedy has been informed by the clerk of the U. S. Supreme Court. The Old Colony Trust Company's part in the case was to have been heard this month.

$200,000 Issue for Improvements and Obligations.—The Shreveport Railways, Shreveport, La., recently filed an application for an amended charter. This amendment, officials stated, authorizes the issue of $200,000 of preferred stock, in addition to present capital, to be used in making improvements to present property and liquidating outstanding obligations.

Income Lower.—For the six months period ended Dec. 31, 1925, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $5,688,734, against $5,704,133 for a similar period the year before. After the consideration of operating expenses and taxes as well as income deductions a net corporate income remained of $721,516 for the six months ended Dec. 31, 1925, against $739,938 for the six months period ended Dec., 1924.

New Directors in Jamestown.—Alfred A. Anderson and Fred B. Tinkham were named recently members of the board of directors of the Jamestown, Westfield & Northwestern Railroad. They are local merchants of Jamestown, N. Y. The choice of these merchants is in line with the company's idea of enlisting the aid of manufacturers in insuring continued operation.

Offers to Pay for Abandonment.— The Tri-City Railway has agreed with the city of Rock Island, Ill., to pay the municipal public benefit fund $7,000 in consideration for right to abandon its Fourth Avenue double-track line from First to Fifteenth Streets, Rock Island. The agreement became part of the record of the hearing before Frank D. Ayres of the Illinois Commerce Commission. The railway will remove the tracks, fill in with rock to bring the avenue to grade and furnish the money for curb along a proposed boulevard down the avenue.

Seven-Mile Alabama Line Dismantled. — The tracks, trolley wires and poles of the old North Alabama Traction Company in Decatur and Albany, Ala., are being dismantled. Thus the last visible traces of the railway system are being removed from these two north Alabama cities. Some months ago service was abandoned on the lines in Decatur and Albany, Ala. At that time officials of the company said the railway no longer paid owing to automobile and taxicab competition.

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Legal Notes

ALABAMA—*Assessment for Paving on Railway as Abutting Property Owner*

A railway bought an easement 25 ft. wide in undeveloped territory on which it built its track. Several years thereafter the city obtained a strip of land on each side of this easement and dedicated these strips for public streets. Later, these strips, but not the railway right of way, were paved, and the railway company was assessed about half the cost of paving as an abutting property owner. When it refused to pay, the city threatened to advertise its right of way for sale. The court held that an assessment for street improvement against such a right of way could not be enforced by sale, so was unenforcible, though leaving a cloud on the title of the railroad, which the latter could require it to be removed by mandamus. The case was differentiated from that of the Alabama Traction Co. v. Selma Tr. & Sav. Bank (104 So. 517) which gave the municipality the right to assess the railroad for the cost of street paving laid between its rails and 18 in. on each side. [Alabama City et al. vs. Alabama Power Co. 160 Southern Rep., 39.]

ARKANSAS—*Act Requiring the Company to Pave Held Valid.*

In 1923 the Legislature passed an act requiring a certain railway company to pay for paving between its rails. The company was operating under an indeterminate permit. Although the act was a special act, it was held valid by the Supreme Court. [Fort Smith L. & P. Co. vs. Board of Improvement, 276 Southwest. Rep., 1012.]

FEDERAL COURT — *Conditions of Issue of Certificate to Interstate Carrier.*

A motor truck company, which claimed it was not a common carrier, appealed to the Federal Court for an injunction to prevent the Public Utilities Commission of Ohio from interfering with its use of the highways of that state in both interstate and intrastate business. The District Court for the Southern District of Ohio held that the Commission had not denied an interstate certificate and that it was justified in denying the intrastate certificate as the carrier had failed to permit himself to be classified as a public carrier. The District Court also held that a State may exact compensation for the use of its highways by interstate carriers, provided the charges are reasonable and uniform, but that a requirement for the carrier to file a satisfactory liability insurance policy or bonds upon terms specified is not applicable to interstate traffic. [Red Ball Transit Co. vs. Marshall, 8 Federal (Second) Rep., 635.]

FEDERAL DISTRICT COURT—*Workman on Uncompleted Part of Station Not Engaged in Interstate Commerce.*

A workman engaged to clear up debris during the construction of a stairway to a station on a road engaged in interstate commerce was injured. At that time the stairway had not been completed, and the employee was held not to be engaged in interstate commerce. [Clemence vs. Hudson & M. R.R. Co., 8 Fed. (Second) Rep., 317.]

FEDERAL SUPREME COURT—*Reasonable Extensions of Service Only May Be Required by Public Service Commission.*

The court will not substitute its own judgment for the determination of a public service commission as to what extensions of the service of a public utility company may be required as reasonable but the court will consider the investment required to make the necessary service extension and the effect of the new service upon the company's income. Then, if it appears that the power to regulate results in an infringement of the right of ownership, the order of the commission will be held invalid. Under the guise of regulation, a state may not require a public service company to make large expenditures for extensions into new territory when the necessary result will be to compel the company to use its property for the public convenience without just compensation. [People ex rel. Woodhaven Gas Light Co., vs. Public Service Commission of New York, 46 Supreme Court Rep., 83.]

FEDERAL SUPREME COURT — *Utility, with Franchise Calling for Inadequate Rate, Not in Position to Maintain Suit to Enjoin Enforcement of that Rate.*

A water company operated on a 40-year franchise which provided for a schedule of prices for water. After the appointment of a state utilities commission which was given control over rates, the water company applied to the commission for power to make a specified increase and received permission for half of the increase asked, to continue for six months. After that time it was told it might apply again for such relief as the results would justify. At the end of the six months' test, without applying again for an increase, the company filed a bill to enjoin the commission from continuing to enforce the rates last fixed on the ground they were confiscatory. The Supreme Court held that the company, having a franchise rate, was not entitled to any judicial relief, however inadequate the rate, and that a grant of any relief, even if only partial, was entirely within the power and discretion of the commission. [Henderson Water Co. vs. Corporation Commission of North Carolina et al., 46 Supreme Court Rep., 113.]

ILLINOIS—*Care Required to Avoid Injury to Child.*

An instruction that if a motorman, by the exercise of ordinary care, could have known that a child was about to cross the track or was in a position of danger, it was his duty to exercise ordinary care to avoid injury, ordinary care being defined as that degree of care which ordinarily prudent persons under the same or similar circumstances would have exercised is not an erroneous instruction. It does not require the motorman to possess absolute knowledge of what the child proposed to do. [Liska vs. Chicago Railways, 149 Northeast Rep., 469.]

INDIANA—*City Authorities Can Prohibit Jitney Buses from Operating Over Certain Streets.*

Public streets are for the use of the public and for general ordinary use, but their use to carry on private business is a privilege and not a right. Hence their use by jitney buses may be permitted by the city upon such terms as it may prescribe. In this decision, the city of Muncie was held to have power to prohibit the operation of such buses on those parts of the city's streets on which there were located street railway tracks, over which cars were regularly operated. The fact that such an ordinance might be a benefit to the street railway company did not make it unfair or unreasonable, and it was not a grant of special privilege or unjust discrimination. [Denny vs. City of Muncie et al., 149 Northeast. Rep., 639.]

MAINE — *Weight to be Given Expert Medical Opinion.*

A trial developed a decided difference of opinion between the expert witnesses on each side as to the injuries which the plaintiff sustained and counsel for the defendant contended that it greatly preponderated in favor of his client and the jury manifestly erred. No claim of bias or prejudice on the part of the jury was made. The court held the testimony of expert witnesses is only an expression of opinion, from which the jury may obtain some assistance, not otherwise available to them, but this testimony is wholly for the consideration of the jury. There is no doubt the plaintiff was seriously injured, so that it is impossible to say that the jury manifestly erred in the award of damages. [Johnson vs. Bangor Ry. & Electric Co., 131 Atlantic Rep., 1.]

MASSACHUSETTS—*Duty of Operator of Car in Reservation Limited to that of Refraining from Reckless Conduct.*

For a considerable distance on Huntington Avenue, Boston, the electric cars operate in a reservation with a vehicle highway on each side. A person intending to become a passenger was struck by a car while he was walking on this reservation toward a stopping post. The court held that the company owed such a person no duty except to refrain from wanton or reckless conduct. [Treen vs. Boston El. Ry., 149 Northeast. Rep. 625.]

PENNSYLVANIA—*Duty of Pedestrian Crossing Track.*

Failure of a pedestrian to look out for cars continually when crossing a street on which there are tracks is negligence *per se*. After crossing one track, the pedestrian should look out for cars on the second track of a double track line. [Patton vs. George et al., 131 Atlantic Rep., 245.]

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Personal Items

G. K. Jeffries Heads C. E. R. A.

Operating Head of Terre Haute, Indianapolis & Eastern Made President of Central West Body

Guy K. Jeffries was elected president of the Central Electric Railway Association at the annual meeting in Indianapolis, Ind., on Jan. 27. Since 1916 he has been general superintendent of the Terre Haute, Indianapolis & Eastern Traction Company. Before that for several years he was the superintendent of the company. This makes the period of his connection with electrific railways one that covers more than 23 years, all spent in work in the Central West.

For 43 years Mr. Jeffries has been

G. K. Jeffries

engaged in one phase or another of railway work. In 1883, when he was only seventeen years old, Mr. Jeffries entered the service of the Cleveland, Cincinnati, Chicago & St. Louis Railroad, or the so-called "Big Four," as telegraph operator. Three years later he was promoted to the position of train dispatcher. After another period of three years Mr. Jeffries resigned from the "Big Four" to become connected with the Erie Railroad as chief train dispatcher and trainmaster. In that post he remained nine years, widening his experience and turning his attention to phases of railroad work which he had not undertaken before.

Just about this time the building of the interurbans was getting under way. Men with experience similar to that of Mr. Jeffries were difficult to find in electric railway work and many new electric roads turned to the steam railroads for operating talent. This is what the Indianapolis & Northwestern Traction Company did. It drafted Mr. Jeffries as superintendent of the road between Indianapolis and Lafayette. Events seemed again to be working in cycles of three years, for Mr. Jeffries in 1906 resigned from the Indianapolis & Northwestern Traction Company to become superintendent of the Terre Haute, Indianapolis & Eastern Traction Company's line between Indianapolis and Richmond. Ten years later he was made general superintendent.

Messrs. Sawyer and Eales Off for Australia

W. H. Sawyer, president of the East St. Louis & Suburban Railway, and Herbert W. Eales of the Union Electric Light & Power Company, St. Louis, Mo., left on Jan. 28 for Australia, where they will direct an extensive survey into electrical development for the Victorian government. Both were honored at a farewell dinner at the Missouri Athletic Association, St. Louis, on Jan. 27. The hosts were the officials of St. Louis public utilities and electrical concerns.

The speakers at the dinner were Louis H. Egan, president of the Union Electric Light & Power Company; Col. Albert T. Perkins, manager for the receiver of the United Railways, St. Louis; T. O. Maloney, W. L. Upson, Fred D. Lyon, G. W. Welsh and Edward Sawyer. Waldo O. Lyman, president of the St. Louis Electrical Board of Trade and president of the Wagner Electric Corporation, was toastmaster.

Messrs. Sawyer and Eales were to sail from San Francisco on Feb. 2. The subjects which they expect to cover in their survey were indicated in the account of their appointment in the ELECTRIC RAILWAY JOURNAL for Jan. 9, page 90.

H. A. Mullet Advanced to Vice-President

Howard A. Mullett, who left the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to join the Yellow Cab Company, Chicago, last August, has just been named vice-president of the latter company, which is now a General Motors subsidiary. Mr. Mullett began his career as an apprentice in a Pittsburgh electrical plant, went through every phase of the business and then entered the automotive field. In Milwaukee he rose from motorman to assistant general manager in charge of transportation. At the time of the establishment of the new department his jurisdiction was extended to cover the company's newly created city and interurban motor bus division.

Charles H. Brough, formerly Governor of Arkansas, has been selected director of the Arkansas Public Service Information Bureau. Dr. Brough served as Governor of Arkansas from 1917 to 1921 and his administration was marked for its progressive and constructive legislation. Before his election as Governor he was identified with the educational interests of Arkansas and Mississippi, serving for twelve years as professor of economics and sociology at the University of Arkansas.

M. Ackerman with Lake Shore

Former Official of Cincinnati & Dayton Traction Made General Manager of Cleveland Interurban

M. Ackerman, general manager of the Cincinnati & Dayton Traction Company, has resigned to become general manager of the Lake Shore Electric Railway, with headquarters at Sandusky, effective Feb. 1.

In thus going to the Lake Shore, Mr. Ackerman is returning to take charge of the property on which he obtained his early electric railway experience. There he started at the bottom, serving, first, as a shop man and, later, as a motorman. Added responsibility came with his appointment as train dispatcher. Later he was made trainmaster.

In December, 1907, Mr. Ackerman started service with electricity on the Youngstown & Ohio River Railway, originally a steam line operating between Washingtonville and Salem, Ohio.

Another move came in April, 1908,

M. Ackerman

when he was made general manager of the Springfield & Xenia Railway. Here he successfully operated a property which had previously been a losing venture. By the fall of that year the improved condition of the company's finances made it possible to pay a dividend to stockholders.

He continued with this property until January, 1914, when he took charge of the operation of the Interurban & Terminal Company at Cincinnati with the title of general superintendent. Again an unprofitable line was put on a paying basis and by 1916 there was a surplus in earnings. An unfavorable situation kept the margin small. Every effort was made to meet the severe conditions brought about by the war, but operating costs mounted rapidly and the company was finally forced to abandon service.

As a result of the reputation he had established for himself in his handling of these properties, Mr. Ackerman was made general manager of the Cincinnati & Dayton Traction Company in July, 1918. Subsequently outstanding mortgages on the property expired and the owners of the underlying liens refused to renew them. To conserve the property a receiver was appointed in

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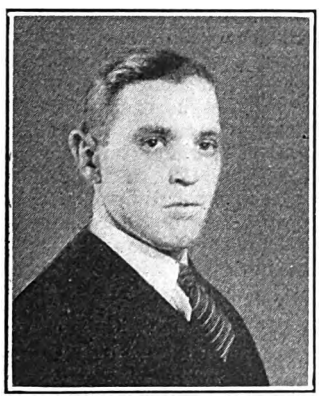
November, 1920. Mr. Ackerman remained as the active operating head. The difficulties encountered by the entire industry during the past few years did not deter the management. It struggled to bring the property back to a profitable earning basis. This work is bearing fruit. Improved conditions have opened a new outlook for the property, which is about to be reorganized. Announcement has been made of a receiver's sale to be held on March 8 as the first step in connection with this proposed plan.

In returning to the Lake Shore Electric Railway, Mr. Ackerman will be in a position to apply to the affairs of that company experience ripened during the most difficult years of the industry's history, a period in which he assumed responsibilities that constantly grew greater.

J. E. Albert Joins Public Service Railway

J. E. Albert, for the past two years assistant general manager of the Wheeling Traction Company, Wheeling,



J. E. Albert

W. Va., resigned that position on Jan. 1 to become traffic engineer of the Public Service Railway, Newark, N. J. Mr. Albert began his railway career with the West Penn Railways in 1916 while a student at the University of Pittsburgh. At this time he was engaged in valuation work. During the summer of 1917 he again engaged in work for the West Penn.

Upon graduation from the School of Engineering of the University of Pittsburgh he enlisted in the U. S. Army and was connected with the air service. He was later commissioned and rated as an aerial observer. In January, 1919, he returned to civil life and entered a special engineering department of the West Penn Railways, dealing with rates and valuation and the appraisal of electric and other properties prior to absorption by that company. He was also engaged on special reports covering arbitration of wages and similar subjects. He remained in this work for three years.

In January, 1922, he was transferred to the office of Vice-President C. P. Billings as assistant to that official. Two years later he was appointed to the position of assistant general manager at Wheeling.

London Tramways Honor Mr. Fell

A. L. C. Fell, who retired recently as general manager of the London County Council Tramways, London, England, owing to ill health, was entertained recently by his numerous friends at a complimentary dinner in London. The gathering included a large number of tramway managers and engineers as well as representatives of municipalities and many men of note associated with tramway enterprise. Sir John Timpson, chairman of the Portsmouth Corporation Tramways Committee, presided. He said in proposing the health of the guest that the increase of passengers and revenue of the London County Council Tramways during Mr. Fell's managership was enormous, and it spoke well for Mr. Fell that he carried out so efficiently his duties in connection with the development. C. J. Spencer, general manager of the tramways associated with the London underground railways, declared it was due to the foresight of those who designed the London tramcars that today these were among the finest passenger vehicles in existence.

Sir Albert Stanley, Sir Arthur Balfour, Sir John Courtis, James Dalrymple and A. Croxton, all men prominent in the British tramway field, spoke of the great work which Mr. Fell had done for the development of tramway services.

In his acknowledgement Mr. Fell said that for transport there was nothing more effective than a steel wheel running on a steel rail. It would have been a happy day for London if the London County Council could have obtained through running rights for cars in the metropolitan area. So far it had not been possible to enter into an agreement that would include the tramways and the omnibuses, but he hoped before long a fusion of interests would take place, because it was the only way in which the traffic of London could be handled satisfactorily.

E. D. Adams Receives John Fritz Medal

Award of the John Fritz Gold Medal to Edward Dean Adams, New York City, for achievement as "an engineer, financier, scientist, whose vision, courage and industry made possible the birth at Niagara Falls of hydro-electric power," is announced by the Engineering Foundation.

This medal was established in 1902 in honor of John Fritz, pioneer in the American iron and steel industry. It is bestowed annually for notable scientific or industrial achievement and is the highest honor bestowed by the engineering profession in this country.

Most of Mr. Adams' long and intensely active business life was devoted to large enterprises combining engineering and finance. He had a leading part in the organization and reorganization of numerous railroads, including the West Shore, the Central of New Jersey, the Western Maryland and the Northern Pacific.

He created the American Cotton Oil Company out of innumerable small companies, led in establishing the All-America Cables and had an important share in many other industrial undertakings. He was also in the investment banking business for many years.

R. G. Winans in Operating Post

R. G. Winans has resigned as assistant engineer of the New York State Public Service Commission to accept the position of field supervisor with the Fitkin Utilities, Inc., under the direction of the General Engineering & Management Corporation, New York.

After he was graduated from Pratt Institute of Science and Technology, in the industrial electrical engineering course, Mr. Winans was employed in the testing and switchboard and central-station construction departments of the General Electric Company. He was also employed by the Schenectady Railway, Schenectady, N. Y., in the power and mechanical departments, later being appointed engineer of power and equipment.

Mr. Winans has been assistant engineer with the New York State Public Service Commission for twelve years. During most of that time he has been

R. G. Winans

in charge of electric railway engineering and operation in so far as it has effected public regulation. To him the subject of valuation has furnished no end of interesting work. Determination and regulation of adequate facilities and service has always offered to him the opportunity for constant study because of the ever-changing traffic requirements.

In his new position he will be associated with C. A. Brooks in the supervision of electric railway properties under the management of the Fitkin Utilities, Inc.

Ed Jacobs, formerly secretary and treasurer of the Shreveport Railways, Shreveport, La., was elected vice-president of the company at the recent annual meeting. He succeeds Capt. W. T. Crawford, who died on Aug. 2.

Lewis Goldberg assistant Attorney-General of Massachusetts, has been appointed a commissioner in the Massachusetts Department of Public Utilities, succeeding David A. Ellis, resigned. In 1914, after practising law for a year, he was appointed Assistant United States Attorney in the Boston district and was active in the Palmer régime in the prosecution of "Red" interests in

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New England. Mr. Goldberg was born in Russia 38 years ago and was brought to Lawrence, Mass., at the age of three months. He was educated at Harvard College and was graduated from the Harvard Law School in 1913.

W. G. Curren has been appointed general manager of the New York terminals of the Baltimore & Ohio Railroad to succeed R. B. White, now an officer of the Central Railroad of New Jersey. In his new capacity Mr. Curren will be in charge of the lines of the Staten Island Rapid Transit Railway, recently electrified.

Charles A. Brann, superintendent of traffic for the Houston Electric Company, Houston, Tex., has also been made superintendent and passenger agent of the Galveston-Houston Electric Railway. He succeeds George G. Morse, who has gone to Palm Beach, Fla., as general superintendent of the Florida Motor Bus Transportation Company.

Obituary

Charles Payson Treat, the engineer who built the street railway system of Trinidad, Col., died at Palo Alto, Cal., on Jan. 28. Mr. Treat took a very prominent part in the building of the Nicaragua Canal and then built a railroad across the Greytown swamp in Nicaragua. He was 79 years old.

Dr. A. C. Harrison, chief surgeon of the United Railways & Electric Company, Baltimore, Md., died on Jan. 17. Many employees of the company feel his death as a personal loss because of his tireless work in their behalf. He entered the World War service in January, 1918, in time to assemble the personnel for what was to become the highly efficient army base hospital 42. Dr. Harrison was 62 years old.

Arthur R. Bush, manager of the industrial department of the General Electric Company, Schenectady, N. Y., died at his home there on Jan. 24. In 1884 he entered the employ of the Edison Company. In 1892 he was made district engineer of the Edison General Electric Company in the New England district, but resigned this position in 1904 to accept the vice-presidency of the Union Bag & Paper Company. In 1906 he returned to the General Electric Company as manager of the power and mining department. Later he was made manager of the industrial department.

Harry C. Mason, electric street railway engineer for the Texas Company, died in Quincy, Mass., on Jan. 26. For many years Mr. Mason was operating engineer in the public utility field. His experience and reputation were recognized in other pursuits and he turned his attention to the science of lubrication as an outlet for his engineering talents, becoming connected with the Vacuum Oil Company in 1902. After three years he went to the Galena Signal Oil Company and after twelve years entered the service of the Texas Company. Mr. Mason was an active member of the New England Street Railway Club. He was born in Portland, Me., on Nov. 10, 1867.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

A Field with Neglected Possibilities

A Synthesis of Opinion Regarding the American Attitude Toward Foreign Trade

Domestic prosperity abounds in the United States. In the electric railway field, as in practically every other line of industry, manufacturers are engaged in a steady, if not an exciting, rate of production. This has resulted in a certain indifference on their part toward export business, of necessity carried on in a manner different from the trade practices of American industry. The attitude of "take it or leave it" quite fits the characterization which many Americans have adopted in the past, when taking part in the drama of international trade.

Mr. Manufacturer asks himself, "Why should I seek to build up a foreign business, in handling which I must make exorbitant concessions as to credit allowances and perhaps throw my policy of highly standardized production to the four winds, when my domestic market is quite adequate for my sales requirements? If the manufacturers of other countries wish to go to the lengths which are demanded of them by the consumers in South America, the Orient, and elsewhere, they are welcome to the business. I prefer to follow the even tenor of my way, and to be undisturbed by any of these annoying considerations which are constantly cropping up in the export business."

That is the shortsighted view. The domestic market may not forever be a purveyor of golden eggs, and the manufacturer who has not made an honest effort to emulate the early Egyptians and store up fodder sufficient for the lean years may find himself very much out in the cold. It is, perhaps, stressing the obvious to paraphrase Washington and say, "In time of plenty prepare for want," but a foothold in the foreign field, gained at the present time, might open a welcome channel for distribution in the event of a slackening of the domestic market. However, the manufacturer must be prepared to go half way in meeting the foreign consumer.

The operator of a railway in the Argentine, for example, has been accustomed to purchasing equipment under a scheme of long-time payments—sometimes six months, sometimes a year and sometimes even two or more years. He has been given these credits by European manufacturers from time immemorial and has come to accept them as a matter of course. If American manufacturers are not willing to talk business with him on something approximating this basis he will, in most cases, take his trade elsewhere.

Furthermore, the foreign operator cannot be brought overnight to a complete adoption of standardized products. He may want a special type of brake on his car which has been long since thrown into the discard by the manufacturers of brake equipment. But if they flatly refuse to turn out a small order of these brakes for him, on the grounds that they could not be produced efficiently, he will most assuredly go to some one who will take a more sympathetic attitude toward his wants, as he conceives them.

The fact that American capital has been so widely distributed throughout the foreign field of recent years augurs well for a wider acceptance of materials produced in this country, provided the manufacturers follow up this very real advantage in their methods of dealing with the consumer. A prominent South American business man stated not long ago that German and English products were widely used in his country prior to the war, because from those sources capital had been secured for investment in the industries there, and, further, that the European manufacturers had always striven to understand his countrymen.

One of the most difficult problems of the export concern, particularly the one that deals with the countries of South America and the Orient, in which the industrial life is carried on at a rate much less intense than is the case in this country, is to impress the American manufacturer with the truth of these facts. The comment has been made time and again that Americans do not and will not understand. But for those who will make a serious effort to study the requirements of the foreign markets a real harvest is at hand, if these same exporters may be credited with knowing whereof they speak.

Hark to the Words of the Maintenance Man!

A touching lament concerning the disturbing custom of bus manufacturers who change the catalog numbers of bus parts with utter abandon and with the most complete disregard for the nerves of maintenance foremen in the operating companies appeared in the January issue of *Two Bells*, the official publication of the Los Angeles Railway. The appeal for the standardization of bus parts follows:

> Catalog numbers of bolts and nuts mean little in the bus manufacturer's life when it comes to a little matter of improving parts, and it follows that these numbers vary with the seasons, owing to the program of improvements in bus equipment. To the troubleman who knows the parts by number, one improvement and another, meaning changes in catalog numbers, force him to gather his repair parts by guess and by gosh, which doesn't always help a stalled bus to get moving. Here is an incident related at the garage to illustrate the state of affairs:
>
> Bus operator, to dispatcher: "This is bus 66. I have trouble with my clutch and can't move! A nut is lost off the lever."
>
> Dispatcher, to garage: "66, clutch trouble, make it snappy."

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Garage foreman to trouble man: "Go out to bus 66 and put a nut on the clutch lever."

Trouble man: "What kind of clutch lever on that model?"

Foreman: "If that bus has a number 79 transmission, it has a 1366 clutch, and let's see, that lever has a double clevis that takes a 5A99 nut, but if that bus has a 92 transmission it will have a 1581 nut."

Trouble man: "Huh!" Goes to store room, "Gimme a bunch of clutch levers and nuts."

Trouble man arrives at bus 66 only to find its transmission has been changed to an 86, which takes a 47½-16 pin!

All joking aside, there is much that the bus manufacturers can do along this line in effective co-operation with the transportation industry.

C. C. Castle Joins the New American Car & Foundry Motors

Charles C. Castle has resigned from the National Railway Appliance Company, New York, the Hegeman-Castle Corporation, Anglo-American Varnish Company and the Genesco Corporation, and on April 1 will be associated with the American Car & Foundry Motors Company.

Important Data Condensed

Mitchell-Rand Manufacturing Company, New York, has prepared a novel wall sheet of the tables most frequently used in both electrical and machine shops. Tables of inch equivalents, copper wire and similar data have been separately printed in many forms for shop reference, but a single chart containing all of the tables in general use is indeed unique.

The United States Bureau of Standards supplied data for the copper wire card and allowable carrying capacities for copper wire. The dimensions of twist drills and machine screws and other shop helps have heretofore been available only after search through technical publications.

P.R.T. Gets 135 Buses

Seventy-five double-deck, semi-inclosed gas-electric buses were ordered a few days ago by the Philadelphia Rapid Transit Company. In addition, 60 single-deck gas-electric 29-passenger buses are to be obtained. The new units will be supplied by the Yellow Truck & Coach Manufacturing Company of Chicago, Ill. It is expected that the buses will cost approximately $1,750,000. Their purchase is one of the steps which P.R.T. is taking to prepare for the Sesqui-Centenial Exposition crowds.

Metal, Coal and Material Prices

Metals—New York	Feb. 2, 1926
Copper, electrolytic, cents per lb	14.04
Copper, wire base, cents per lb	16.00
Lead, cents per lb	9.25
Zinc, cents per lb	8.40
Tin, Straits, cents per lb	62.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.85
Somerset mine run, Boston, net tons	2.20
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.625
Central, Ill., screenings, Chicago, net tons	1.25
Kansas screenings, Kansas City, net tons	2.30
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N.Y., cents per lb.	17.75
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.30
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.03

No Need for Concern

Fear for Condition of Steel Industry Is Unfounded—Railway Buying Is Active

The post-holiday period in the steel trade is always one of temporary retrenchment, with a considerable decrease in purchasing and in orders received by fabricators and other consumers of steel. Having established a new record for production last year, the market has been content to rest for a time upon its laurels and to indulge in the luxury of a breathing spell. Some prophets of gloom have, of course, been quick to predict the inevitable slump. But the majority of observers are maintaining an optimistic outlook upon things generally, with a healthy inclination to proceed a bit cautiously and to advise against any incipient movements toward inflation.

The mid-January issue of *Iron Age* says:

> It has taken the first ten business days of the new year for the steel market to get a fair start and much of its activity in that time has been in specifications rather than new orders. While the heavy finished steel bookings in November brought out some suggestions of a movement toward higher prices, there are no indications today of such an effort as that of last January to stimulate specifications by advancing quotations.

Railway buying has been a considerable feature of the past month's activity, with some heavy orders placed for rails, cars and structural steel. The majority of this has of course occurred in the steam railroad field. A rather interesting comment on the price situation which has existed in the face of record production was made by A. I. Findley, editor of *Iron Age*, in his annual review. He said:

> Now that producers know how easily we can have a 44,000,000-ton year, which ought to give a fair business and fair profits for all, cannot some of them cease selling as though they were in a 30,000,000-ton year and cease trying to operate as though it were a 50,000,000-ton year?

Improvements Made in White Chassis

To meet the changing conditions of passenger transportation the White Company has made a number of improvements and refinements in its special bus chassis, which hereafter will be known as the White bus chassis Model 50-B, supplanting Model 50-A.

One of the more important changes is the installation of Westinghouse air brakes as standard equipment. This type of brake on rear axle makes it possible to use metal to metal friction surfaces, considered the most effective way of dissipating the heat which accompanies severe braking and regarded as the best way to insure effective brake control under all conditions and long life for brake linings.

Various mechanical refinements have been made in the motor, improving flexibility and smoothness of operation. Among other changes, the manifold has been fitted with a hot air stove. The oil system has been revised and improved by increasing the oil pump capacity and by the installation of an effective oil strainer. A large area of fine mesh wire screen removes all dirt particles, providing a clean oil supply at all times.

Other refinements made in the chassis include an improved rear axle with double bearings of taper roller type at wheel ends of spindles, designed to meet the most severe conditions of operation; a stronger frame, 10 in., with gusseted cross members; an improved radiator, consisting of heavy cast aluminum shell with removable core; a faster third speed, with other transmission improvements; a heavier housing and tube in the steering gear, making easier steering, and larger tires, 34 by 7 pneumatics, with duals in rear.

The White Model 50-B bus chassis is built with the optional wheelbases of 198 in. or 230 in. to accommodate bodies seating from 25 to 29 passengers.

Record Order for Fare Boxes Placed with Johnson

What was said to be the largest single order for fare boxes to be used in one-man bus operation ever placed in this country was that recently accorded to the Johnson Fare Box Company, Chicago, Ill. This concern was chosen to supply the apparatus necessary to collect fares on the 333 gas-electric buses recently ordered by the Public Service Railway, Newark, N. J.

The boxes to be manufactured for this order will be of the 12-volt, automatic type, the electric current for their operation being supplied from the storage batteries of the buses. They are the same general type as the boxes in use on the street cars of the Public Service Railway, except that the voltage feature has been modified to suit bus operation.

Messrs. Woodin and Curwen Head New Brill Company

W. H. Woodin, head of the American Car & Foundry Company and the American Locomotive Company, has been elected chairman of the board of directors of the Brill Corporation. The other directors include Samuel M. Curwen, Francis A. Lewis, W. Clarke Mason, E. P. Rawle, W. M. Hager, C. S. Sale and G. R. Scanland. The executive committee consists of W. M. Hager, chairman; S. M. Curwen and W. H. Woodin.

The directors elected the following officers of the new corporation which was organized recently to acquire the J. G. Brill Company, the Hall-Scott Motors Corporation and the Fageol Motors Company:

President—Samuel M. Curwen.
Vice-President—G. R. Scanland.
Secretary—H. C. Wick.
Treasurer—S. A. Mallette.

Rolling Stock

Sunbury & Selinsgrove Railway, Selinsgrove, Pa., has ordered three double-truck closed motor cars, equipped with Brill 77 E-1 trucks, from the J. G. Brill Company, Philadelphia, Pa.

Arkansas Central Power Company, Little Rock, Ark., has ordered 30 single-end safety cars, equipped with Brill

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79 E-1 trucks, from the American Car Company, St. Louis, Mo.

Medelline Municipal Railways, Colombia, has ordered from Brill four single-truck safety cars for first-class service and two single-truck safeties for second-class service.

Bogota Municipal Tramways, Brazil, has ordered one complete single-end safety car equipped with Brill 79 E-1 trucks from the J. G. Brill Company, Philadelphia, Pa. In addition, seven car sets, complete except for woodwork, have been ordered from the same source for erection in Brazil. These are of the single-end, double-door type, equipped with Brill trucks.

New York, Westchester & Boston Railway, New York, N. Y., is contemplating the purchase of ten or twenty additional standard passenger motor cars for service on the various lines of the company.

Georgia Railway & Power Company, Atlanta, Ga., at the end of 1925 received 40 one-man safety cars for use on the city line in Atlanta. The company ordered in January of this year ten new one-man cars. Five of these are for the Stone Mountain line and five for the Atlanta to Marietta line. Details of the city cars are as follows:

Builder of car body	Cincinnati Car Company
Type of car	Double-end, double-truck safety
Seating capacity	48
Weights:	
Car body	17,444 lb.
Trucks	10,860 lb.
Equipment	9,076 lb.
Total	37,380 lb.
Bolster centers, length	20 ft. 6 in.
Length over all	46 ft. 4 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	11 ft. 8 in.
Body	All steel
Interior trim	Light mahogany
Headlining	Agasote
Roof	Low monitor
Air brakes	Safety Car Devices
Armature bearings	Sleeve
Axles	Brill, Cambria hammered steel
Bumpers	Pressed steel
Car signal system	Faraday
Car trimmings	Bronze oxidized, Dayton
Center and side bearings	Brill
Compressors	Westinghouse Traction Brake DH-16
Control	General Electric K35-JJ and line breaker
Curtain fixtures	Rex roller; Curtain Supply No. 90, pinch fixture
Curtain material	Pantasote, grain Morocco, color No. 86
Destination signs	Keystone ILR
Door-operating mechanism	National Pneumatic Door Engines
Energy-saving devices	Economy Meter
Fenders	H-B wheel guards
Finish	Enamel
Gears and pinions	One-half GE A-1, one-half Tool Steel
Hand brakes	Peacock staffless
Heater equipment	Consolidated Car Heating No. 321 and thermostats
Headlights	One-half Crouse-Hinds, one-half Golden Glow
Journal boxes	Brill
Lightning arrester	General Electric aluminum cell
Motors	Four GE-265-A, inside hung
Registers	Ohmer
Sanders	Ohio Brass, form 2
Sash fixtures	Dayton, wedge type
Seats	Hale & Kilburn, AWO-400
Seating material	Springless canvas-lined cane
Slack adjusters	American automatic
Springs	Brill
Step treads	Aluminum, Cincinnati Car Company
Trolley catchers	Ohio Brass No. 13141
Trolley base	Ohio Brass, form 4
Trolley wheels	Nuttall 6 in.
Trucks	Brill 77-E-1
Ventilators	Monitor sash
Wheels	26 in. chilled
Special devices	Treadle door, rear exit signal lights, brakes and power interlocked with treadle door.

Track and Line

Hot Springs Street Railway, Hot Springs, Ark., is expending nearly $100,000 in paving its right-of-way and improving its roadbed and service generally.

Capital Traction Company, Washington, D. C., undertook approximately ten rebuilding and replacement jobs in 1925. One of the most important was the rebuilding of tracks from 29th Street to 35th Street in Georgetown. Rebuilding and paving from 29th Street to 32d Street, cost $70,000. From 32d Street to 35th Street there were general repairs to the tracks and a new paving at a cost $17,500. On Eighth Street Southeast, another complete track rebuilding job cost $77,500. A new crossover on You Street at Portner Place, cost $17,150. A switch at Rock Creek Loop, which had to be completely rebuilt, cost $8,520. The east crossing at Pennsylvania Avenue and Fourteenth Street was rebuilt at a cost of $14,100, of which the company paid $7,050. A crossing over the Baltimore & Ohio Railroad tracks at Chevy Chase Lake, cost $1,680. New ties, ballast and joints for the track on Kennedy Street, cost $6,040. Work on Connecticut Avenue in connection with the removal of the center poles, and other work, cost $49,600. The total for all the work was $255,040.

Power Houses, Shops and Buildings

Interstate Public Service Company, Indianapolis, Ind., suffered a loss of approximately $40,000 on Jan. 20 when a new building, an addition to the machine shops at Scottsburg, Ind., was destroyed by fire. The building was equipped with much valuable machinery, most of it new. The loss is covered by insurance.

Boston Elevated Railway, Boston, Mass., is considering the erection of a garage on Washington Street, Somerville. A. J. Blackburn, the company's engineer, is preparing plans.

Chicago & Joliet Electric Railway, Joilet, Ill., has announced plans to erect a garage, with a capacity for 25 buses, at St. Louis and Osgood Streets, Joliet, Ill. Work will start as soon as weather permits.

Trade Notes

Fred M. Egolf is now representing the Timken-Detroit Axle Company in the Eastern territory. He was formerly with the Haskelite Manufacturing Company and joined the Timken organization as a railway representative the first of the year. After a period of instruction at the Detroit plant of the company he was transferred to New York, where he will make his headquarters at 2 Rector Street.

G. R. Scott has become connected with the Electric Service Supplies Company, Chicago. Mr. Scott has been connected with the Electrical Engineering Company, St. Paul Electric Company, Fort Wayne Electric Works, General Electric Company and recently has been district manager of sales in Chicago for the Jeffery-DeWitt Insulator Company. Mr. Scott will cover the states of Minnesota, North and South Dakota, Iowa and eastern Nebraska.

Walter Jackson, Mount Vernon, N. Y., has reprinted in pamphlet form the paper "What Can Railway Men Do Toward Relief of Traffic Congestion," presented by him before the meeting of the New England Street Railway Club at the Copley-Plaza Hotel, Boston, Mass., on Oct. 29, 1925.

Earle Gear & Machine Company, Philadelphia, Pa., has announced the sale and transfer of all designs, patterns, patents and good will covering Earle centrifugal pumps to the Aldrich Pump Company, Allentown, Pa. The transfer will in no way conflict with the Earle company's regular business of manufacturing Earle truck gears, cold metal saws and special machinery.

Atlas Safety Brake Company, Inc., Buffalo, N. Y., manufacturer of hand brakes and safety brakes, has been chartered at Albany with $200,000 capital. Edward C. and Louise M. Norton, 37 North Division Street, Buffalo, and Charles J. Kuhn, 90 Main Street, Tonawanda, N. Y., are the directors and subscribers. Hubert E. Collins, 622 Prudential Building, Buffalo, is attorney for the corporation.

New Advertising Literature

International Harvester Company of America, Chicago, Ill., has issued a 95-page bulletin illustrating the various types of McCormick-Deering industrial tractors and operating equipment which are available for road work and other types of industrial service.

Crouse-Hinds Company, Syracuse, N. Y., has issued a folder setting forth the various applications of its safety hand lamps. These are constructed to withstand the severe service encountered in railway shops, garages, industrial plants, storehouses, and similar places. A number of types are provided so that varying service requirements may be met with a maximum of efficiency. The lamps are listed and described in Bulletin No. 2071.

Armco Culvert & Flume Manufacturers' Association, Middletown, Ohio, has issued Bulletin R-23, entitled "Reducing the Cost of Culvert Replacement." It deals with the problem of placing culverts under existing embankments which are in active use for transportation purposes and indicates that the "jacking" method is the most effective manner of carrying on this type of work. Ten advantages of this method are given. They are: (1) Roadbed is undisturbed. (2) No work is done on track level. (3) No false work required. (4) No traffic interruption. (5) "Slow orders" not required. (6) Safety of train operation unimpaired. (7) Cuts construction period to one-half or one-third. (8) No special equipment or skilled labor required. (9) No settlement of track after construction. (10) Installation costs reduced to less than one-half.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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MORRIS BUCK, *Managing Editor*

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Personality a Great Asset to Electric Railway Officials

DETERMINATION of whether or not a certain man possesses the requisite qualities to become a good electric railway executive cannot be made according to any general rule. Neither experience nor education alone, nor a combination of the two, is a guarantee of fitness. In the past the importance of qualifications other than experience has not always received the attention which it deserves. Nowadays it is receiving more consideration.

It is not enough for an executive in the utility business to know his own job thoroughly. That, of course, is an essential. But to be really successful he must be more than a good engineer or a good operating man. He must have a personality that encourages friendliness and creates confidence.

Wars are caused by lack of understanding. Specific conditions may be the immediate reason for their outbreak, but failure to understand the point of view and the thinking of the other side in the controversy is the underlying difficulty. This is just as true of conflicts between the public and the utility company as it is of conflicts between nations, and nothing can be more unprofitable for a utility than a war with the public it serves.

The man who can do the most for an electric railway company is often the man who can go before the people and tell them what his company is trying to accomplish, how it is trying to serve them, and the difficulties with which its operation is beset. A successful utility executive need not necessarily be a talented public speaker, but he should at least be able to tell the story of his company in simple, straightforward language that every one can understand. When a selection is to be made of a man to fill some executive position, length of service should not be the determining factor, but rather his ability to operate successfully and inspire a feeling of general confidence that things are being properly managed.

Did the Eastern Massachusetts Trustees Do the Job Too Well?

AN EXTRAORDINARY job was done in rehabilitating the Eastern Massachusetts Street Railway. That is history. It has all been made plain before. Now the question arises about the proper place of the investor. That is a legal point for the courts to settle. A special master, reporting to the courts, has reviewed the affairs of the company at length. His findings make interesting reading. As indicated in ELECTRIC RAILWAY JOURNAL for Feb. 6 the master's report sets forth the financial policy of the trustees and the present condition of the company. His was a fact-finding inquiry. The problem before the court is to construe the intention of the statute under which the road is run. Earnings have been put back into the property liberally, too liberally apparently to suit some.

There is no need here to do more than animadvert to the facts established by the special master. The issues involved are of course of primary interest to the investor, but those who followed the vicissitudes of the company in the early days and studied the work of the trustees in re-establishing the company have an economic interest in the case. The thought that occurs is that if the trustees had done less than they did, there probably would not be anything upon which to raise the question now propounded. The thoroughness of their job is shown by the statement that even in the face of decreases in gross earnings the net operating revenue has been stabilized by economies and maintained without great variation since 1921 even under reductions in fares. Surely this is an extraordinary record. The trustees took the position that their right to apply income to rehabilitate the road was not limited to the depreciation accruing after the new company was incorporated, but included depreciation which accrued before that time. As the special master points out, the company has been honestly managed, its assets prudently conserved and the capital values enhanced by the earnings put back into the property. There would be little doubt about the propriety of this procedure under private operation. In this case, however, under the provisions of the special act settlement of the question that has been raised may depend on different principles.

There Is Only One Danger in the Daily Dozen

STUBBORN, indeed, would be the condition in the electric railway industry that did not yield under the persistent application of the code which Mr. Storrs prescribed at Indianapolis. Note the word persistent. That is important. It is a daily dozen, not an occasional dozen. Necessarily, Mr. Storrs had to generalize. He was not dealing with any particular case. There was no real need for him to be specific. Indeed, his method of treatment did not permit of it. Instances of the beneficial results of the practice by electric railways of all the homely virtues prescribed by Mr. Storrs are not far to seek. In fact, the very meeting at which he spoke furnished one of the best examples of this. It was a coincidence that the paper by Mr. Budd was presented at Indianapolis. Was ever more striking evidence furnished than by Mr. Budd to show that the exercises were not only well suggested but that their diligent practice pays?

Measure the Budd speech and the known accomplishments of many other roads in terms of the Storrs suggestions! It is great mental exercise. Mr. Storrs said: "Let us not say that a thing cannot be done." That, in-

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deed, is dangerous in the light of accomplishments on the Insull properties, on the roads that have won the Coffin award, on the roads that have competed for that award and on those that have been resuscitated financially but for one reason or another have not been competitors for that award, to say nothing of many others. One who does hold either to the thought that it cannot be done or who says it cannot be done may be awakened from his attitude of negation by the proof that it has been done. Instance upon instance is on record of accomplishment in this industry if one will only put into practice the first of Mr. Storrs' principles of conduct, the one that advises exercise of the eyesight.

Pains were not spared by ELECTRIC RAILWAY JOURNAL to place before the industry both the Storrs speech and that of Mr. Budd. There is no intention here to attempt to recapitulate them. There is, however, just one more thought. As Mr. Budd so aptly said, problems are not peculiar to the electric railways. Every business has its troubles. Self-commiseration is a calamity for those who practice it. There are men in the electric railway industry capable of grasping the vast transportation opportunities. Any other conclusion is untenable. The facts belie it. There is one danger and only one in the daily dozen—it may not be practiced by some to the extent that it deserves.

The Sting Was the Sting of the Wasp

TACOMA has a Mayor who is a perpetual candidate for that office. He has been in and out of the post ever since 1896. He is one of those anomalies peculiar to American politics that are difficult, indeed, to explain. The perpetual candidate of Tacoma is A. V. Fawcett. He has been against the street railway first, last and all the time. To him change in ownership of the property has made no difference. In 1922 he was elected to serve until 1926 on a platform of 5-cent street car fares. He will undoubtedly run for re-election in the spring. It is the probable outcome of that election which is agitating the city.

Tacoma's street railway management is progressive. The operators are among the ablest in the industry. At the incoming of the Mayor for his present term the railway put into effect the $1 weekly pass. This $1 pass was kept in force until Sept. 15, 1924. During the 26 months the pass was sold at $1 it proved extremely popular. More than 60 per cent of the riding was on the pass at an average fare of 3¾ cents. Riding increased, but extra service had to be given at a lower average fare. Beginning on Jan. 1, 1924, the company conducted a campaign for relief from burdensome franchise restrictions so that the $1 rate might be continued. This movement, backed by the federation of local improvement clubs, was successfully blocked by the Mayor. As a result the price of the pass had to be raised to $1.25. These facts are related so that the picture may be reasonably complete.

As the Mayor pretended to see it, 100 palaces on wheels, as he refers to buses, run at a 5-cent fare would drive the street cars out of business and make a lot of money for their operators. It is just here that theory and fact have been shown to part company. For some time 22 jitneys have been run over routes paralleling the street car lines, but the jitney company on which the Mayor has pinned his hopes is growing restive. One of its officers has openly accused the Mayor of sacrificing the stockholders to further his own political interests. The jitney company has thrown open its books to show that not in a single month of its eighteen-month period of operation has there been a profit. Anybody who knows anything about the transportation business could have foretold this result. The voice of the railway would, however, have been a voice in the wilderness. Mayor Fawcett is not the first public official of his kind. It is one thing to have a bee in the bonnet, but it is quite another to be stung by a wasp.

Blocking of Public Transportation in Snowstorms Demands Vigorous Methods

NOT so many years ago a snowstorm was hailed with delight by the street railway manager, as it would bring in extra revenue that would far more than balance the cost of cleaning the tracks and making incidental repairs to the equipment. The recent heavy snowstorms along the Atlantic coast, however, have shown that there is danger of complete paralysis of public transportation under such conditions unless more stringent limitations are put on the operation of private automobiles and motor trucks.

Particularly in Boston and New York have conditions been bad. The surface railways have done their part and more in cleaning snow off their tracks and keeping the lines open. But no sooner has the way been cleared than a procession of miscellaneous motor vehicles has crowded in on the tracks and made it virtually impossible to move traffic of any kind at more than a snail's pace. Worse than that, in not a few instances vehicles have become stalled in such positions that they blocked the tracks and then have been abandoned. Reports from Boston indicate that in numerous cases this happened. Complete cessation of rail service ensued until the obstruction could be cleared away. On the other hand the buses operated by the Boston Elevated Railway did not fare so badly. They were able to detour through streets used less by general traffic and so were able to maintain some sort of service.

Public policy dictates that conditions of this sort should not continue. Traffic congestion is at all times an increasingly serious problem. But when a public utility with an excellent organization fights the elements to open the way for the general public, its customers, there is no excuse for the occasional individual, in order to save a little personal discomfort or for the sake of a slight private gain, to discommode the thousands who are looking to the railway to transport them. The city of Boston was scored heavily for failure to anticipate the storm and make provision in advance for clearing away the snow, as did the railway. In New York the very complete equipment of the street cleaning department was used to clear the roadways on streets without trolley tracks, leaving the railways to do the best they could alone, despite the motor vehicular traffic that followed in the wake of the plows.

Managements of transportation systems in all parts of the country where snow blockades are at all common should act to bring city governments to the realization that co-operation in respect to keeping street car tracks and bus routes free from interference in such emergencies is a duty. Whatever ordinances are needed should be passed. But this is not enough. It must be seen to that they are enforced.

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Give the Exact Fare to Conductor— Put the Bill on the Plate

WHEN the railway emerged from the dark ages of the "public-be-damned" policy to the halcyon era of the "public-be-pleased" attitude co-operation replaced conflict, but it was more the wisdom of giving a helping hand than the feeling for it that prompted the idea of service plus. This wisdom brought with it the knowledge that co-operation was a business, a scientific one, too, and that like philanthropy, its ally, it needed astute direction if it were to be a success.

Of course, such management did not carry with it the stigma attached to the philanthropy of Jesse James, who succumbed to the entreaties of the old woman to spare her rent for the expected landowner and then in ambush waited for the return of the enriched rent collector. Nor was it comparable with the altruistic impulse of the woman who, upon beholding a bread line on the street, straightway went to the bank to deposit the $500 her husband had given her to buy a fur coat. No, the administration of co-operation as understood by the railways was on a higher plane. They believed implicitly in the principle that co-operation should bless the one who gives as well as the one who takes, although fundamentally the alpha and omega of the doctrine was that charity can start with advantage at home.

Saving one's own soul is intrinsically not a bad belief, but with the advance in time the solid rock upon which such a code was built gradually crumbled and moldered into the newer ethics which stressed the salvation of one's neighbor. A striking example of this is noted in a recent advertisement by a railway in a local paper. Here it is in part:

"Sunday morning seems to be the worst morning that our trainmen have for making change. Patrons seem to depend upon the street car conductors to 'break' bills so there will be change for the church collections. Why not give the correct amount to the conductor, and put the bills in the collection?"

A mighty swing of the pendulum and the clock has struck for a new co-operation cult obliterating its more sordid parallels. At least one railway is prepared for the change. It has found more gratification in giving than in receiving and has learned that it is more salutary to feel co-operation than to know how to define it. Just as "sorrow does not spring out of the ground," so the causes of co-operation have been imbedded in a well-founded if occult philosophy.

Public Relations Are After All Human Relations

STREET railway men often take themselves too seriously in their dealings with the public. This may be seen frequently in the dignified but stiff appeals found so often in their newspaper advertising. Judging from present trends, the public wants amusement far more than instruction. This is the day of the movie, the radio and the tabloid newspaper. People are headline readers and simply will not take time to read through long statements in small type. In a measure the same principle applies to other forms of publicity as well.

But take a serious campaign, take out the non-essentials and dress up the vital part in attractive form. Lo and behold! The reader has been reached and his confidence gained. Of course, success in winning public good will depends on intangible factors, such as doing the right thing at the right time.

The three main factors are relations with newspapers, relations with city officials and relations with the car-riding public, according to L. J. DeLamarter. His paper before the Central Electric Railway Association midwinter meeting, published in this paper last week, is an excellent analysis of methods that can be used to reach these various elements. That Mr. DeLamarter has been successful in this work is testified to by the good public sentiment in Grand Rapids and favorable action in connection with franchise and other matters. Careful perusal of this article should show others not only how one railway has succeeded, but it should suggest methods other operators can turn to good account on their properties.

Personalized Service Might Be Tried on Car Lines as Well as on Bus Lines

LUCIUS S. STORRS, in his recent paper before the Central Electric Railway Association at Indianapolis, said the electric railways were not doing all that they might to attract new business. The trend of passengers carried, varying upward or downward, followed closely the composite curve of the business trend throughout the country.

"By not doing all that they might" has at least two meanings. The operators might do more to attract riding on the old-established rail lines by improved cars and improved facilities in general, and they might do more by improved types of service such as exemplified in the Chevy Chase de luxe line of the Capital Traction Company in Washington, D. C., described in this issue. J. H. Hanna, vice-president of that company, nearly a year ago conceived the idea that there would be an opportunity for a high-grade suburban service, and against the opinion of many railway operators and some bus operators started the 8-mile line.

Naturally an operation of this kind will be an experiment for many months until normal operating costs and normal traffic can be established. Indications are, however, that it will be more than self-sustaining. For the initial period of 2½ months there was an operating deficit, but December and January showed a comfortable net. The important point established, however, is that there is a demand for a superior service. Transportation, like articles of food and dress, must appeal to a wide variety of tastes. Service that is merely a means of transportation from one point to another will be patronized only by the people to whom it is a necessity. Others will find means of transportation more to their liking—and will be willing to pay for it.

To meet this modern demand electric railways in general have only begun. In some cases, as was intimated by Mr. Storrs, they have gone backward. To be sure, there have been signal advances in an ever-growing number of cases. But it is a sad commentary that advances in transportation methods have often been made only when a new type of vehicle such as a de luxe bus has been introduced, and along with it a progressive management has pointed the way to a new standard of service. The electric car, the backbone of the industry, is too often allowed to roll along with the service standards of 20 and sometimes 30 years ago.

Mr. Storrs has stated the case mildly. Why not give more special treatment to the electric car? Why not personalize this service, not alone by publicity but by new equipment, new standards and modernized methods?

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The Capital Traction De Luxe Coach Runs Between Chevy Chase and Downtown Washington

De Luxe Coach Service Pays in Washington

Five Months Experience of the Capital Traction Company with the Chevy Chase 25-Cent Coach Line Shows Substantial Net Revenue—The Parallel Street Car Line Has Not Been Affected Materially—Several Factors Have Contributed to the Success of the Service

DE LUXE coach service has now been given by the Capital Traction Company, Washington, D. C., for practically five months with gratifying results. The route, which is 8 miles long, connects Chevy Chase, a widely known high-class suburb lying to the northwest of the city, with the downtown business district, including the Union Station and the Capitol. The fare charged is 25 cents, children under five being carried free. Initially the service consisted of a 20-minute headway in each direction from 7:30 a.m. until midnight, requiring four buses with two in reserve. Shortly after the service was started a fifth coach was used during the morning and evening rush hours, with one in reserve. Patronage developed rapidly and before the end of the year two more coaches were ordered. The headway in certain parts of the day, morning and evening, was cut to ten minutes and seven buses are now necessary to take care of the peak crowds.

The coaches are type Y parlor cars manufactured by the Yellow Truck & Coach Manufacturing Company of Chicago. They seat 21 passengers in individual leather upholstered seats. They are well lighted and attractively finished inside and out and appointments are used that add elegance and comfort. There is a separate smoking compartment, and baggage racks are provided. Each smoking compartment is equipped with four nickel-plated ash trays. Paper matches are supplied by hotels and others desiring the excellent advertising accruing from such practice. The coaches are cleaned thoroughly inside and out nightly, not just swept out.

Operators are carefully selected and instructed in the art of giving personalized service. They are clad in a special olive green whipchord uniform of military design, differing not only from the uniform of the platform men, but from operators of the regular buses of the company. Woven on the coats and the caps of the uniform is the company's monogram in red. Black leather puttees, black shoes, white collars and black ties complete the operator's distinctive uniform.

Comfortable Individual Seats in This Chevy Chase Parlor Coach Operated by the Capital Traction Company, Washington, D. C., Accommodate 21 Passengers. A Smoking Compartment Can Be Seen in the Rear

The company adheres strictly to the no standee pledge made when this service was started. This keeps the service up to a high standard that appeals to nearly all the patrons. Occasionally, of course, it causes disappointment to persons who are unable to board a bus. Drivers are instructed to stop and explain in such cases that standing in the bus is not allowed. This practice is appreciated, as is evidenced by comments made to operating officials. "Good morning" from the operator helps greatly to

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start the morning's transaction pleasantly. Each coach has the operator's name on a brass stencil nameplate mounted on the instrument panel so that the passengers soon know the operators by name. This makes the operator feel that he is a part of the company and helps to make possible the personalized service so greatly desired.

Fares are collected by means of the Rooke system, using a standard register mounted in a special holder.

From the beginning of the service on Sept. 15 there has been a steady growth in the business. The first 2½ months showed operating deficits, but in December the gross business done increased so greatly that it produced a surplus of $767. January, even without the holiday business, produced practically the same revenue, although expenses were somewhat greater. The operating statement follows:

OPERATING RECEIPTS AND EXPENSES, CHEVY CHASE DE LUXE COACH SERVICE

	Sept., 1925*	Oct., 1925	Nov., 1925	Dec., 1925	Jan., 1926
Revenues	$1,644	$4,377	$5,150	$6,769	$6,746
Expenses	2,550	5,630	5,669	6,002	6,272
Net revenue	.....	.....	.....	$767	$474
Operating deficit	$906	$1,253	$519	.....	.....

*Sixteen days only.

In the above table operating expenses include depreciation and taxes, but not interest on the investment.

A study of the appeal that such a service has to the community shows that its greatest attractiveness is to men and women who otherwise might use their private automobiles. The parking problem, severe in Washington as in every other city, is a constantly growing deterrent to the use of private automobiles. In a large sense it creates a demand for just such a service as was started by the Capital Traction Company. While a study of the traffic indicates that the service is used to a great extent by men and women shoppers, it is also used extensively by business people, as is evidenced by the more extensive traffic during the rush hours.

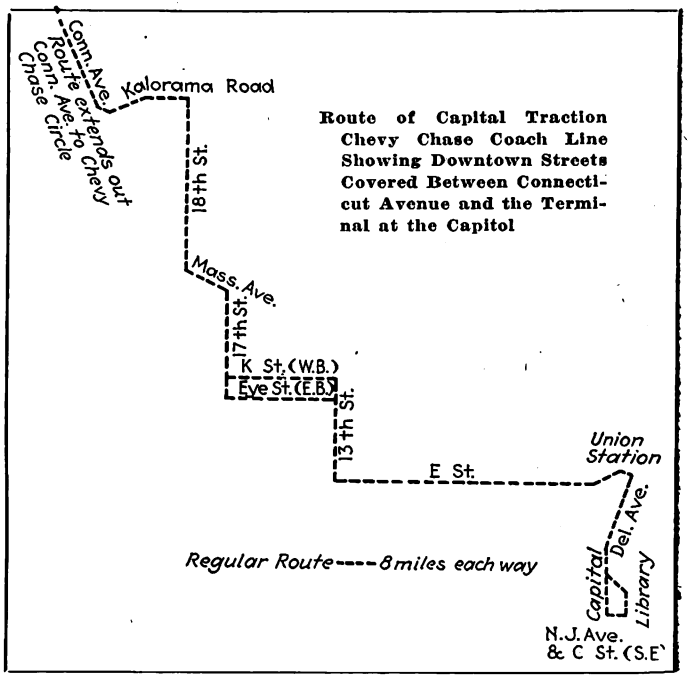
Out of the experience of the coach operators, many incidents have been collected which tell volumes as to the reactions of the passengers and show their appreciation of the service. A few of these instances are cited here:

One parent brings a small child to the coach each morning and the operator lets him off in front of the school.

A lady boarded a coach with two children and paid fare for all three. She told the operator she would gladly take them both in her lap if the coach became crowded. She uncomplainingly did this a little later to avoid having passengers passed by.

At another time a man alighted from a coach two squares from his destination so that a lady might get aboard, as the seats had all been occupied.

Many senators and representatives are patrons of the service. One morning a senator who is a regular rider between his home in Chevy Chase and the Capitol stopped an outbound coach on its way to Chevy Chase and asked the operator to watch out for him on his way down, as he wanted to walk a little of the way. When the coach reached the senator it had a seated load and the operator stopped to inform him and express his sorrow at not being able to carry him. The senator said, "Sanders, you know I must be at the Capitol at 9 o'clock. Give me 2 cents to buy a paper and I will sit on the baggage rack." Operator Sanders gave the senator the necessary 2 cents and the coach proceeded on its way with the senator riding on the baggage rack.



Route of Capital Traction Chevy Chase Coach Line Showing Downtown Streets Covered Between Connecticut Avenue and the Terminal at the Capitol

On one occasion a man was unable to board the coach downtown on its way out to Chevy Chase because it was already loaded. So he took a taxi and followed until some one got off, whereupon he left the taxi and boarded the coach.

In another case a man missed a coach at the Union Station and followed in a taxi until he caught up with it after a drive of about five miles. He then left the taxi and boarded the coach, telling the operator he was still saving a dollar.

One complaint recently registered by a lady said that the coaches were too quiet and that it was dangerous to have them running around when one could not hear them.

To aid passengers unique stop signs painted in Capital Traction green with white lettering have been erected at important points. One of these is shown in an accompanying view. Each sign is specially lettered to indicate the exact time the bus is due to pass. The coaches will stop anywhere on signal for passengers, but of course do not stop at the designated points unless signaled.

Bus Stop Sign

This stop sign is a ride-selling feature. It gives the actual time the bus can be expected.

From the Chevy Chase terminal to Thirteenth and F Streets, in the principal shopping district, the running time is 24 minutes and to Union Station 31 minutes. This schedule is slightly in excess of 15 miles per hour for the eight-mile run. It is of course considerably higher than is possible on the street car line.

Inauguration of this service was made by J. H. Hanna, vice-president in charge of operations of the Capital Traction Company, by sending out about 1,200 individual typewritten letters. A reproduction of one of these appears elsewhere. To the same list booklets

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THE CAPITAL TRACTION COMPANY
General Offices, 36th and M Streets
Washington, D. C.

September 12, 1925.

Mr. John Doe,
1234 Connecticut Avenue,
Washington, D. C.

Dear Sir:

We wish to call to your attention the fact that this company will begin operating on September 15th a special parlor-car coach line between Chevy Chase Circle, the shopping, theater and business districts, the Union Station and the Capitol. The line is to be called the Chevy Chase Coach Line.

We have purchased 6 of the latest type motor coaches for use on the Coach Line. They are unequalled, we believe, in riding comfort, luxuriousness of appointment, attractiveness and, of course, safety and mechanical detail. They have individual seats—there will be no standees on the Coach Line, at any hour—smoking compartments, baggage racks, and will be operated by men chosen specially, who are instructed to pay the greatest attention to the comfort and convenience of passengers.

We feel there is a demand for this form of public transportation, more luxurious and speedier than may be given by a street car, but furnished at a price far below that of the taxi-cab or the cost of private automobile operation. Coaches will run every 20 minutes throughout the day, from a little after seven a. m., until midnight.

The route: South from Chevy Chase Circle over Connecticut Avenue to Kalorama Road; east to 18th Street, south to Massachusetts Avenue; east to 17th; south to Eye; east to 13th; south to E; east to Union Station Plaza; east over Delaware Avenue and through the Capitol grounds, to New Jersey Avenue and C Street, Southeast.

On the return trip coaches will go east and north around the House Office Building, past the Library of Congress, before entering the Capitol grounds. At 13th Street, where they turn north, they will continue to K before turning west. Otherwise the west and north route follows the same streets as the south and east.

We recommend this new service to your consideration. It offers a $1 ride for 25 cents.

Very truly yours,

J. H. HANNA,
Vice-President.

Introducing the Parlor Car Coaches, Vice-President Hanna Sent Out Some 1,200 Letters to Prospective Passengers Along the Eight-Mile Route

and cards advertising the service and giving the schedule on which the coaches would operate were sent at several later times. A young society girl was employed for a few weeks to send out personal letters to her friends on special stationery. Since the start of the coach service much additional literature has been distributed by the operators.

For about half of the distance between Chevy Chase and downtown Washington the coach line parallels the Chevy Chase electric car route of the Capital Traction and of course for the whole distance parallels it in effect. No apparent reduction in traffic has been noted on the car lines; in fact, there was a slight tendency upward following the general local trend in this community, so that it appears that the traffic attracted by this de luxe service is new business or at least business the company had years ago and which was lost during the rapid growth in use of the private automobile.

New Magazine Issued by Utility Organization

THE demand for closer contact among the departments of the operating division of the Byllesby Engineering & Management Corporation has been met with the publication of *Byllesby Management*, an executives' magazine. Halford Erickson, vice-president in charge of operation, planned the paper.

The magazine will collect and publish information relating to the operation and management of public utilities, with special reference to those operating under the supervision of the Byllesby Engineering & Management Corporation. The range of topics will be wide, including engineering, construction, financing, sales of service, merchandising of appliances, rate making, valuation, customer ownership and many other subjects in the respective fields of electric, gas and railway operations. Important subjects will be dealt with editorially from the viewpoint of the man inside the organization.

Enlarged Scenic Photographs Make Fine Posters

REAL ingenuity marks the plan used by the Metropolitan Division of the Hydro-Electric Railways of Ontario to advertise pleasant places along its lines. These localities deserve colored posters, but the size of the division would not justify the cost. On the other hand, halftone reproductions on the paper ordinarily used for placards would not do justice to the scene pictured. Therefore the management evolved the plan of making up placards out of enlarged photographs with block letters for text. The ensemble is so attractive that in some cases the stores which help to display the cards are loath to discard them when new subjects come along. The usual edition does not exceed fifty and the cost averages about 50 cents per placard. In addition to the display in stores, these placards are, of course, placed in Hydro stations and cars. Reductions of the same photographs are made for use in the folders that are sent to social organizations in soliciting pleasure traffic both summer and winter.

Some Recent Placards Advertising Pleasure Resorts on the Metropolitan Division of the Hydro-Electric Railways

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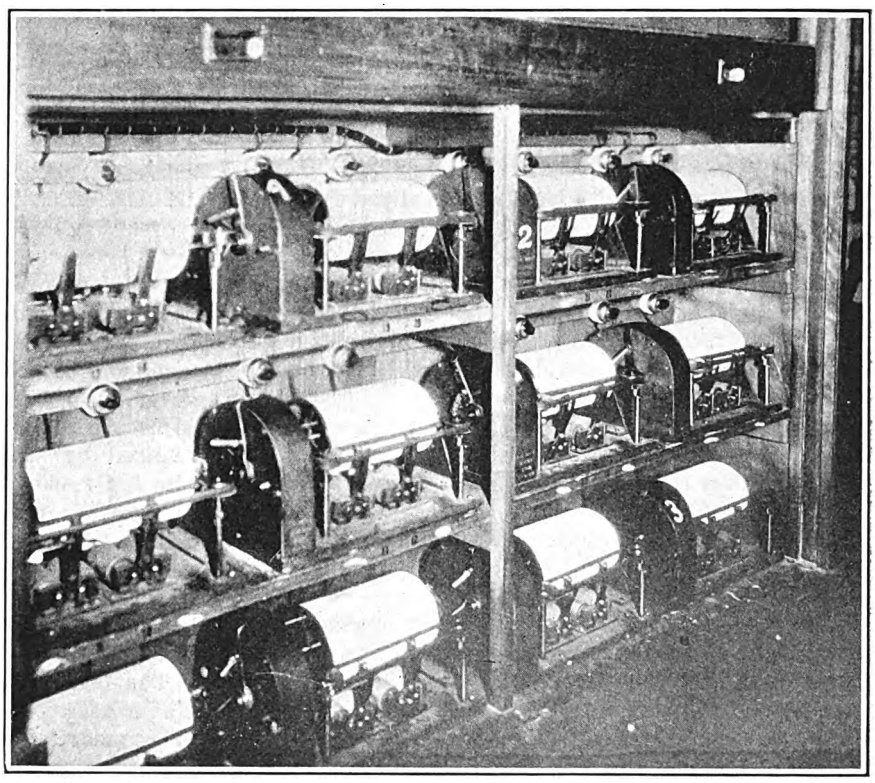
Centralized Installation of Headway Recorders Saves Time

Information Is Obtained More Quickly and the Machines Give a Better Performance Under This Arrangement—Only Inbound Cars Are Checked

EARLY in 1920 the Milwaukee Electric Railway & Light Company installed seven Nachod automatic headway recorders on its local lines in Racine. The results obtained from this installation were considered of sufficient value to warrant a trial in Milwaukee. Accordingly in 1922 recorders were installed on three lines from which a considerable number of complaints in regard to service had been received. Good results were obtained from these installations, but it was found very difficult to keep the clock mechanism properly regulated when being cared for by the line supervisors. On the other hand, to have a man from the general office change the records and care for the clocks entailed a great waste of time in traveling from one location to the other. The idea was then conceived of having the recorder mechanism placed in the main office and connected electrically with the distant contact pan. One instrument was accordingly connected in this manner and gave such excellent results that in 1924 the management approved a plan for covering all 24 lines in Milwaukee with recorders and having the instruments centrally located in the main office. This installation was completed late in 1924 and the recorders have now been in operation for more than a year.



Battery of Nachod Headway Recorders Assembled in Main Office of the Milwaukee Electric Railway & Light Company

Inbound Cars Only Checked

In making this centralized installation it was decided that from the viewpoint of the passenger it was more important to check inbound cars, or those going toward the business section, and of considerably less importance to check outbound cars. Contact pans were accordingly placed over the inbound tracks only and with their centralized arrangement one recorder instrument is made to cover two locations, so that only twelve machines are required to cover the full 24 lines in the city.

The scheme of operation is as follows: The contact pan is placed at a selected point along the line where only cars of that line pass and so located as to avoid as many pull-out or pull-in cars as possible. On the nearest convenient pole is placed a relay, which, receiving the impulse at 600 volts, closes a 52-volt circuit through a telephone cable to the main office, terminating in a telecode relay. This relay closes a 220-volt circuit which operates the recorder. The twelve recorder instruments are placed on shelves in a dustproof cabinet which has a sliding glass front counter-balanced so that it may easily be raised to get to the recorders. The recorder half sheets are numbered consecutively from 1 to 24, corresponding to the 24 locations controlled. Each location is connected through its own snap-switch so that any individual location can be cut out. An accompanying illustration shows the cabinet with the glass door raised.

After trying several different methods of working up the data the one described below was evolved as giving the most and easiest read information for the amount of labor involved. On the first of each month a sheet of millimeter cross-section paper is prepared for each line. This sheet is labeled with the name of the line, month, number and location of recorder pan, all the sheets for any one month being bound at the top in book form. This sheet is divided vertically into two parts, the first half covering from 6 a.m. to 3 p.m. and the second half from 3 p.m. to midnight. In the first column is marked time, each small division representing one minute. In the second column is marked the run number and in the third a horizontal mark indicates the time when that run is scheduled to pass under the recorder pan. The succeeding columns are marked with the dates of the month, Saturdays, Sundays and holi-

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days being excluded, as on those days the schedules are different.

Each day when the records are taken from the machines the actual passing times of the cars are indicated on this sheet by means of short horizontal marks. In this way the operation of any particular run can be followed through from day to day. After the data from the original sheet have been transcribed to this monthly record, any large gaps in service are noted and reported on the form shown, a copy being given to the supervisor in charge of that line, who looks up the cause for the delay and notes it on the form, which is then returned to the superintendent's office.

To handle the records from these 24 locations requires the time of two clerks for a half day. One clerk reads the time as indicated on the original record, while the other records it on the monthly sheet.

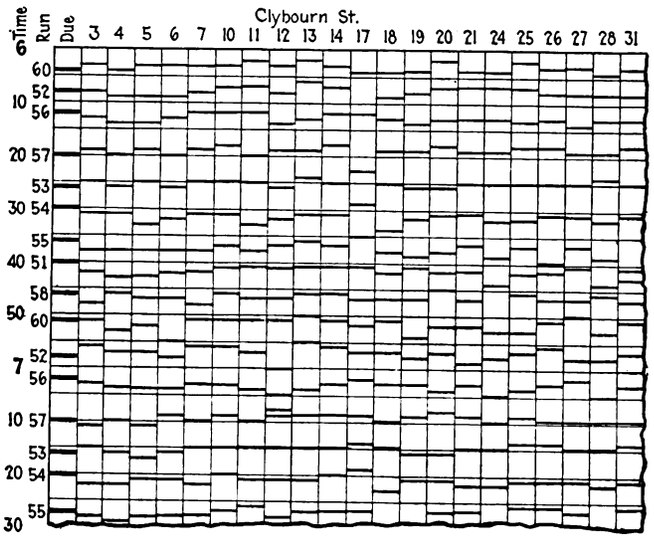
Advantages of Centralized Installation

Some of the principal advantages realized from this centralized installation are:

1. The clock mechanism, being in a room at uniform temperature, gives much better regulation than could be had if installed out of doors.
2. All the records can be changed in about a half hour, whereas an unreasonable length of time would be required to visit the pan locations.
3. If anything does get out of order a spare machine can be substituted in about five minutes, whereas formerly the tower truck had to be sent out to change it.
4. In case of minor trouble, such as a torn ribbon, it is discovered immediately, while formerly it was not discovered until the next day, thus losing the entire day's record.
5. In case of severe snowstorm (not uncommon in Milwaukee) when the machine could not be reached, damage was done by jamming. This does not happen now.
6. In cases of complaint in regard to long waits the matter can be checked up immediately. Formerly it was necessary to wait until the following day to see the record.
7. Two locations can be recorded on one machine.
8. The records are never damaged due to being changed in a rain or snow storm.

The records have been used to good advantage in hearings before the Wisconsin Railroad Commission involving frequency and regularity of service. Complaints alleging excessively long waits for cars fell flat when mechanically made records of service were produced. By tabulating a month's record on one sheet, a picture of operation can be obtained that cannot be realized by studying each day's records individually. The supervisor by studying these sheets can obtain quite interesting information concerning the men under his charge. For instance, certain runs are found to be persistently ahead of time, others are generally late, while another may operate spasmodically. This monthly tabulation will also indicate whether or not a schedule is too fast, too slow or just right.

The company is now working out the details of a plan whereby at the end of each month the delays will be summarized for each line and expressed in terms of minutes delayed per 100,000 car-miles or per cent of total cars off schedule. These summaries will then be posted in the carhouses and an attempt made to stimulate a friendly rivalry between the supervisors and trainmen of the various lines to see which line can make the best record of cars being on schedule.



Information Is Compiled Showing the Performance of Each Car Day by Day. August, 1925, Chart Is Shown

REPORT OF IRREGULARITIES IN SERVICE

Line Clybourn Date 8-19-25

Records indicate that no car passed

N.H.R. Location No. 16

From	To	Cause
3:21 P	3:34	Load of iron stuck at 5th and Sycamore

Investigated By _____

Reports Are Made on This Form of All Serious Interruptions and Sent to Line Supervisor

Diner on Fast California Train

SERVICE on the San Francisco & Sacramento Railroad and the Sacramento Northern Railroad has been augmented by the addition of a new combination observation and dining car. Passengers traveling from Oakland and San Francisco to Sacramento will be particularly benefited. The car is attached to the limited train that leaves San Francisco daily at 7:40 a.m. and Oakland at 8:15. This train arrives in Sacramento at 10:40, continues its journey north and reaches Chico at 1:40 p.m. Passengers for Sacramento from the bay cities may breakfast while they ride, and northbound passengers will have the opportunity to eat their midday meal while en route. The dining section of the car will accommodate sixteen persons.

On the return trip Sacramento passengers from Chico, whence the train leaves at 1:50 p.m., may have their luncheon on board. Sacramento passengers, southbound, find the dining service a convenience, leaving, as they do, at 4:40 p.m. and arriving at Oakland at 7:40 and San Francisco at 8:15 p.m.

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Ten-Year Statistics Show Gain in Electric Railway Conditions

In Decade, Electric Railways in Large and Small Cities Have Had Increases in Revenue and Traffic per Inhabitant and Show More Economical Use of Cars

By Albert S. Richey
Electric Railway Engineer, Worcester, Mass.

HAVING had occasion to make comparison of some general operating statistics of the electric railways of the United States in 1914 and in 1924, and to segregate these figures as between the companies serving cities of a population of 500,000 or more and the remainder of the country, it is thought that some of the figures resulting from this study might be of interest to the readers of the ELECTRIC RAILWAY JOURNAL.

The general statistics which apply to the country as a whole are given in Table I. In general, they are similar to those presented by John A. Beeler in the paper on "The Electric Railway Car," which he presented at the Atlantic City convention last October. The figures for population, however, have been revised to exclude that part of the population which the Census Bureau classifies as "rural."

TABLE I—POPULATION, EXCEPT RURAL, IN UNITED STATES. ELECTRIC RAILWAY REVENUE, PASSENGERS AND CARS

United States	1914	1924	Per Cent Increase
Population (except rural)	57,000,000	67,000,000	18
Operating revenue	$625,000,000	$1,027,000,000	64
Revenue passengers	10,250,000,000	13,100,000,000	28
Passenger cars	76,000	77,000	1

In the above table the operating revenue and revenue passengers for 1914 have been determined by interpolation between the 1912 and 1917 figures of the U. S. Census Bureau. The corresponding figures for 1924 were obtained by applying to the Census Bureau figures for 1922 the percentages of change between 1922 and 1924 as shown by the statistics of the American Electric Railway Association. The numbers of passenger cars in use in 1914 and in 1924 were taken directly from Mr. Beeler's paper; it is understood that they were derived partly from the census figures and partly from ELECTRIC RAILWAY JOURNAL data.

GAIN SHOWN IN REVENUE AND PASSENGERS PER INHABITANT

Similar statistics were obtained directly from the electric railways operating in the thirteen cities of the United States which have a population of 500,000 or more. These cities are New York, Chicago, Philadelphia, Boston, Detroit, Cleveland, St. Louis, Baltimore, Los Angeles, Pittsburgh, San Francisco, Buffalo and Milwaukee. By deducting the figures which apply to these thirteen cities from those shown in Table I the statistics shown in Table II were obtained. These apply to the electric railways in the United States outside of the thirteen cities with a population of 500,000 or more.

The increase in revenue passengers shown in Table II, especially for the smaller cities, is some higher than actual comparative figures would warrant, as there was some zoning in fare limits during the period considered, and passengers who are now paying two fares for a ride which was bought for one fare ten years ago tend to increase the 1924 passenger figures unduly for comparative purposes. This caution applies also to the derived figures shown later, but it is believed that the effect of such zoning as has occurred is not great enough to affect adversely the general conclusions which may be drawn from these figures, especially if this effect be borne in mind.

BOTH SMALL AND LARGE CITIES SHOW INCREASES

It is interesting to note that the railways in the thirteen cities, which serve 28 per cent of the urban population of the country, operate 36 per cent of the cars, carry 53 per cent of the passengers and receive 43 per cent of the total operating revenue. The population of these thirteen cities has increased 22 per cent in ten years, as compared with only 16 per cent increase in the remaining urban population. The number of revenue passengers in the thirteen cities has increased 38 per cent, while in the remainder of the country the increase has been not more than 18 per cent. The operating revenue has increased 76 per cent in the large cities and 57 per cent in the remainder of the country. The larger increases in revenue passengers and operating revenue in the thirteen large cities is accounted for, of course, by the greater amount of necessity riding and the relatively smaller influence of the bus and privately owned automobile. In spite of these latter adverse factors, it is gratifying to note the quite substantial increases in both number of passengers and operating revenue in the country outside of the thirteen large cities.

That the rolling stock equipment is being used much more efficiently at present than ten years ago is indicated by the fact that the largely increased number of revenue passengers is being handled by a decreased number of cars in the larger cities and by a number of cars only slightly increased in the smaller communities.

Based on the figures shown in the three tables pre-

TABLE II—DIVISION OF STATISTICS IN TABLE I BETWEEN DATA FROM THIRTEEN LARGE CITIES AND URBAN POPULATION IN THE UNITED STATES OUTSIDE THOSE CITIES

Thirteen Cities	1914	1924	Per Cent Increase	1924 Per Cent of Total
Population	15,450,000	18,800,000	22	28*
Operating revenue	$251,500,000	$441,300,000	76	43
Revenue passengers	5,060,000,000	7,000,000,000	38	53
Passenger cars	28,000	27,650	1†	36
U.S. Outside Thirteen Cities				
Population (except rural)	41,550,000	48,200,000	16	72*
Operating revenue	$373,500,000	$585,700,000	57	57
Revenue passengers	5,190,000,000	6,100,000,000	18	47
Passenger cars	48,000	49,350	3	64

*Per cent of population (except rural) of United States. †Decrease.

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sented above, the derived statistics shown in Table III were obtained.

TABLE III—PASSENGERS AND REVENUE PER INHABITANT AND OTHER STATISTICS FOR THIRTEEN SELECTED CITIES AND OTHER URBAN POPULATION

	1914	1924	Per Cent Increase
Passengers per Inhabitant per Annum			
United States	179.8	195.5	9
Thirteen cities	327.5	372.3	14
U.S. outside thirteen cities	124.9	126.6	1
Revenue per Inhabitant per Annum			
United States	$10.96	$15.33	40
Thirteen cities	16.28	23.47	44
U.S. outside thirteen cities	8.99	12.15	35
Average Revenue per Passenger	Cents	Cents	
United States	6.10	7.84	29
Thirteen cities	4.97	6.30	27
U.S. outside thirteen cities	7.20	9.60	33
Passengers per Car per Annum			
United States	135,000	170,000	26
Thirteen cities	180,700	253,200	40
U. S. outside thirteen cities	108,000	123,600	14

It is not surprising to note that the annual number of rides per person is three times as great in the large cities as in the remainder of the country. In the large cities the rate of increase in passengers per inhabitant per annum (14 per cent) is two-thirds as great as the increase in population in the same cities (22 per cent). It will be remembered that before the advent of the automobile it was generally assumed that the passengers per inhabitant would increase at practically the same rate as the population. There is some satisfaction also in the figures showing that the passengers per inhabitant for the United States outside the thirteen large cities has about held its own, indicating that the electric railway is at least as important a factor in the life of this public as it was ten years ago, and that its business has not been reduced seriously by the automobile. Evidently the latter, including both bus and privately owned car, is caring for such increased movement of passengers as has been occasioned by the increase in population.

Average Fare Increased More in Smaller Cities

The average revenue per passenger as shown above is obtained by dividing the total operating revenue by the number of revenue passengers. It therefore includes revenue from sources other than passenger fares, such as freight and other miscellaneous revenue, and is still further increased by the inclusion of interurban fares, so that the figures as shown do not represent average fares. The percentages of increase, however, between 1914 and 1924 correspond as closely as might be expected with the increases in fares over that period. The indication is that the average fare has been increased more in the smaller cities than in the thirteen large ones. Inasmuch as the traffic in the smaller cities is much less dense, and as compared with the larger cities has shown a lesser increase in the ten-year period, the greater relative increase in unit fares was, of course, quite necessary.

The figures giving the amount of revenue per inhabitant per annum evidently are dependent on the number of rides per inhabitant and the average revenue per ride, and show, as may have been expected from a consideration of the former figures, that the increase is greater in the larger cities than in the smaller. It is interesting to note, however, that even outside of the thirteen large cities the average person was paying about $9 a year for electric railway transportation in 1914 and more than $12 at present.

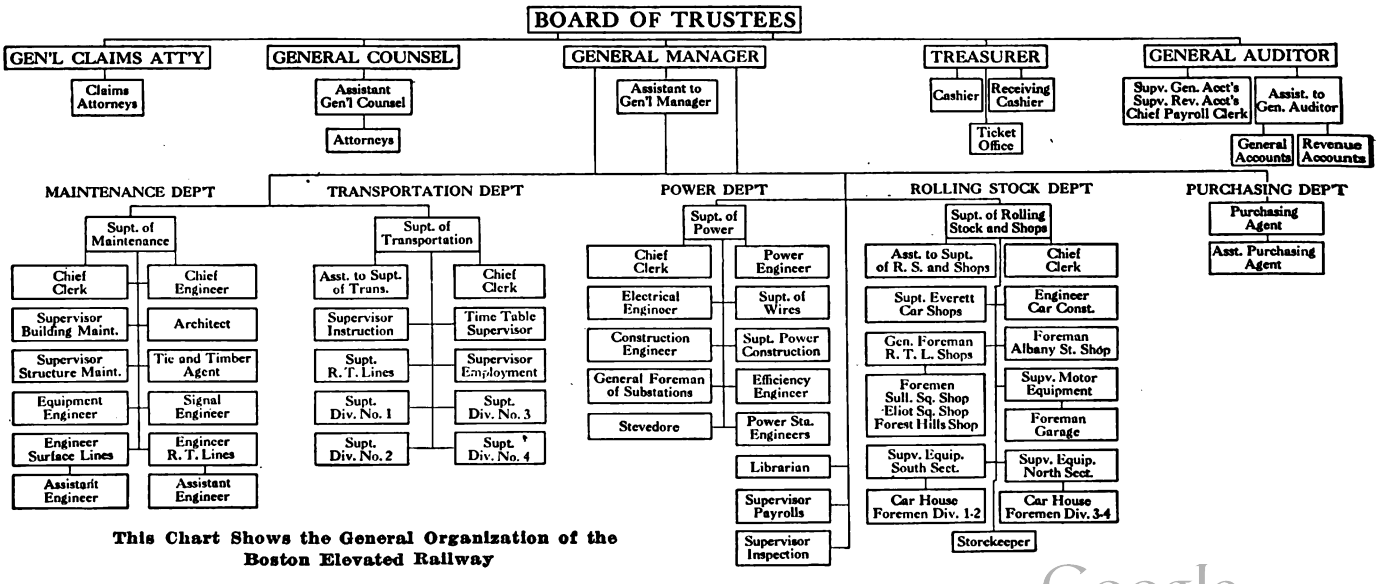
Better Use Being Made of Rolling Stock

The last of the derived figures shown above indicates a very considerable betterment in the efficiency of the use of rolling stock. Each active passenger car in the thirteen large cities is at present carrying 40 per cent more passengers than it did ten years ago, and even in the smaller communities, despite the much-talked-of destructive competition of the automobile, each car is carrying 14 per cent more passengers than it did ten years ago. This increased efficiency is all the more noticeable since at present there are in use in the country some 6,000 28-ft. one-man cars, all of which are of much smaller passenger carrying capacity than the two-man cars which they replaced.

Departmental Organization of Boston Elevated Railway

FIVE departments, each reporting to the Board of Trustees, constitute the organization of the Boston Elevated Railway. The largest department, of course, is the operating organization under the general manager. This department is again divided into five departments as follows: (1) Maintenance department; (2) transportation department; (3) power department; (4) rolling stock department; (5) purchasing department. In addition, the librarian, the supervisor of payrolls and the supervisor of inspection report directly to the general manager and assistant general manager.

The organization chart reproduced was used in one of the lectures in the educational course on the Boston Elevated Railway and a copy appears in the last issue of the company's bulletin.



This Chart Shows the General Organization of the Boston Elevated Railway

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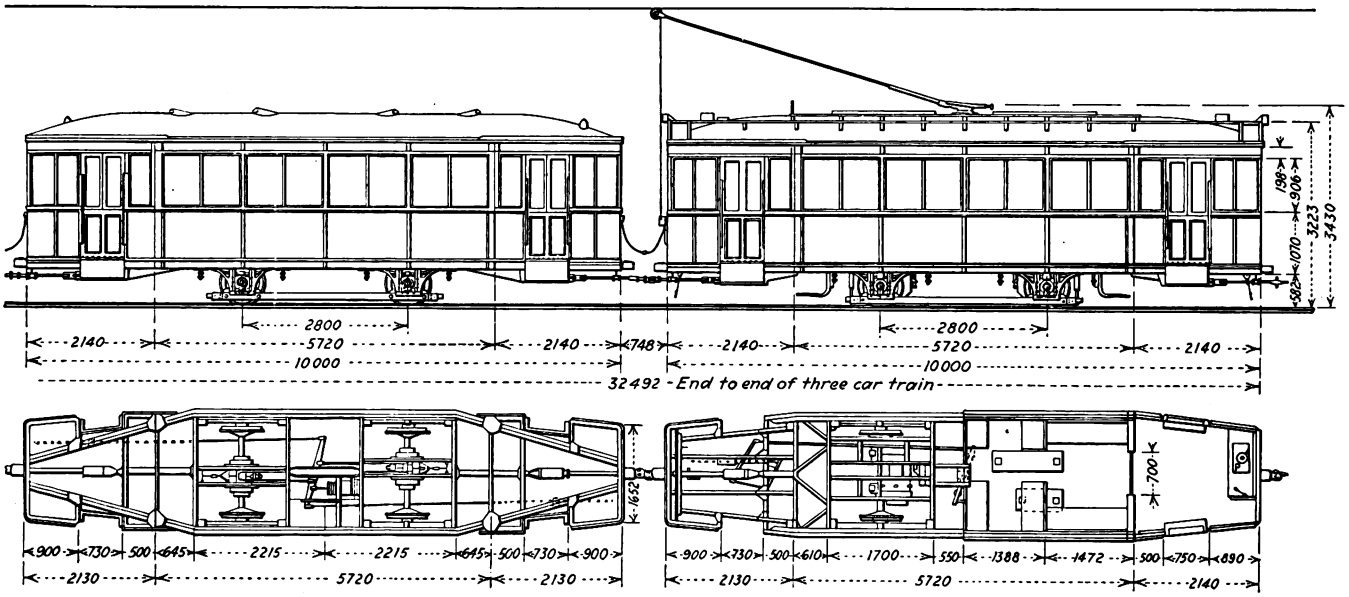
Light Weight Motor Cars and Trailers for the Berlin Surface Lines

Wheels Are Mounted Directly on Car Body Without Use of a Truck, and Cars Are Equipped with Band or Disk Brakes Which Are Mounted on Armature Shafts of Motor Cars and on Axles of Trail Cars—There Are No Brakeshoes

By E. Kindler
Engineer of Equipment Berlin Street Railway System, Berlin, Germany

DURING 1925 the Berlin Street Railway System put in service 500 new motor cars and 500 new trailers. Both types differ radically in outward appearance and in design from those previously used in Berlin. Instead of a monitor roof an arch roof was chosen, by which 600 kg. (1,320 lb.) in weight was saved. Two roof ventilators are used on the motor cars and four on the trailers. These ventilators, with adjustable louvers (1,400 x 140 mm. or 55 x 5.5 in.) over the side windows, insure a plentiful exchange of air without causing any draft on the occupants of the car.



The Berlin Surface Lines Have Recently Put in Service Three-Car Trains Consisting of a Motor Car and Two Trailers
Only the motor car and one trailer are shown in this plan and elevation. Novel features are the absence of trucks and substitution of disk and band brakes for brakes which operate on the wheels

The exterior of the car has been so finished and painted as to show a streamline effect. This is gained by windows of uniform size and butt joints between side girders and window sashes, and by painting the car body above and below the windows yellow and the side posts white.

The windows are held in brass sash with rubber strips. The glass sash are 4 mm. (5/32 in.) thick. On the hood, at each end of each motor car, are two square illuminated markers for showing the route number. Between these markers is the route sign. The same type of route markers used on the motor cars is employed on the trailers as well.

All cars carry the usual wooden guard directly in front of the wheels. In addition, the motor cars also have an automatic fender under the platform with trip in front. The car journal boxes are fitted with special projections to which lifting jacks can be readily applied in case of accident.

All structural steel parts for the car framework are of standard shapes and are joined with standard gusset plates so as to make every part readily replaceable. All steel parts were sand-blasted after being cut and immediately thereafter dipped in varnish so as to prevent even the slightest trace of rust.

The cars have no separate truck, but the side sills of the car rest directly upon long-leaf springs which rest on the car journal boxes. On the motor car these springs have ten leaves, 1,600 mm. long and 100 mm. wide (63 in. x 4 in.). On the trailer there are ten leaves 1,400 mm. long and 75 mm. wide (55 in. x 3 in.). At each end of these leaf springs are placed small supplementary spiral springs to take up light shocks when the cars are no more than one-quarter occupied. For a larger number of passengers these spiral springs are completely compressed.

The steel framework of the car is built up on Z-shaped side sills the lower flanges of which point outward and support the four V-shaped corner posts. The upper flange of the Z-shaped side sill is turned to the inside of the car and supports the car floor. On these side sills also are bolted the cast-steel pedestals, in which the journals have a play of 1 mm. (0.04 in.) in each

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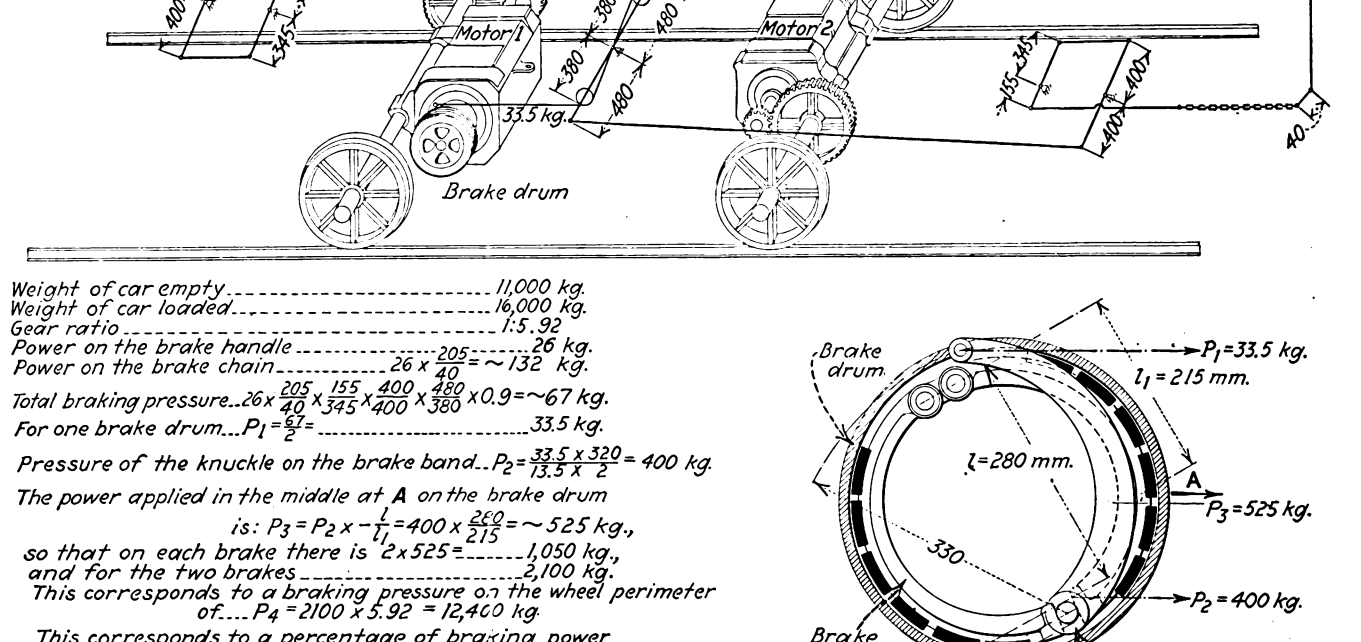
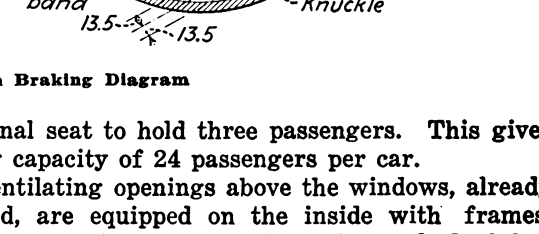
direction. Through the use of these Z side sills and small high-speed motors, it was possible to keep the floor of the car at the same level as the front and rear platforms and to have both only 770 mm. (30 in.) above the top of the rail.

In the trailers a somewhat different form of floor framing is followed. Here the side sills are 10.5 m. (34 ft. 5 in.) long and extend under each platform from buffer to buffer. At their ends under each platform these side girders are bent inward toward the draft rigging, so that the shocks from the coupler are transmitted directly to these girders. On the motor cars the side sills end at the corner posts and the platforms are carried on four straight U-beams which can readily be replaced if the platform should get damaged.

The floor framing of the car is supported on steel channels with liberally dimensioned gusset plates, the thickness of the flooring being 25 mm. (1 in.). The car framing is so designed that the roof, which is stiffened with carlins and is covered with "triolin," can be put in place separately and is independent of the rest of the framework. On account of the frequent sidewiping damage of the Berlin street cars, the side panels had to be made very easily replaceable. These are of 1.5-mm. (1/16-in.) sheet steel and are fastened to the side posts with wood screws. They are not used to stiffen the framework of the car. The vestibule hoods are of four-ply and are readily replaceable in case of damage.



Weight of car empty ..... 11,000 kg.
Weight of car loaded ..... 16,000 kg.
Gear ratio 1:5.92
Power on the brake handle ..... $\frac{205}{40}$ ..... 26 kg.
Power on the brake chain ..... $26 \times \frac{205}{40} = \sim 132$ kg.
Total braking pressure ... $26 \times \frac{205}{40} \times \frac{155}{345} \times \frac{400}{400} \times \frac{480}{380} \times 0.9 = \sim 67$ kg.
For one brake drum ... $P_1 = \frac{67}{2} =$ ..... 33.5 kg.
Pressure of the knuckle on the brake band .. $P_2 = \frac{33.5 \times 320}{13.5 \times 2} = 400$ kg.
The power applied in the middle at A on the brake drum is: $P_3 = P_2 \times \frac{l}{l_1} = 400 \times \frac{280}{215} = \sim 525$ kg.,
so that on each brake there is $2 \times 525 =$ ..... 1,050 kg.,
and for the two brakes ..... 2,100 kg.
This corresponds to a braking pressure on the wheel perimeter of .... $P_4 = 2100 \times 5.92 = 12{,}400$ kg.
This corresponds to a percentage of braking power of 78% for a loaded car
This corresponds to a percentage of braking power of 113% for an empty car



Armature Band Brake on Motor Car with Braking Diagram

Interior Design and Finish

Inside of the car, as well as inside of the entrance vestibules, all steel surfaces have been covered with oak veneer, which has been fumed for 48 hours in ammonia vapors, and subsequently coated with "mattin" lacquer. In this way the appearance of a steel car has been entirely avoided. As a matter of fact, the brown hue of the fumed oak, the simple white ceiling, the dark red artificial leather covering the steel spring upholstered seats, the paneled car sides and the narrow brass fittings give the interior of the car a very homelike appearance, such as was intended by the designer of the interior, Prof. Bruno Paul.

The over-all width of the car is 2,200 mm. (7 ft. 2½ in.) and the width of the aisle is 553 mm. (21¾ in.). In consequence, four cross-seats, each for two passengers, were put on one side of the aisle, and four seats, each for one passenger, were placed on the other side of the aisle. Then at each side of each end there is a longitudinal seat to hold three passengers. This gives a seating capacity of 24 passengers per car.

The ventilating openings above the windows, already mentioned, are equipped on the inside with frames, which serve as advertising racks. The method of fastening used prevents any bulging out of the printed matter in times of wet weather.

A considerable departure from conventional design is represented by the arrangement of the body sash. In these cars the two center sash on each side of the body slide sideways, thus avoiding the need of pockets for drop sash or facilities for permitting them to raise. These movable sash are provided with weather stripping to keep out the drafts in winter.

The car is lighted with 25-cp. lamps, mounted on the sideposts above the cross-seats and so dimensioned that reading matter in the hands of a seated passenger will receive about 30 lux luminosity. Shadows of passengers standing in the aisle do not fall upon the paper of the reading passenger.

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TABLE SHOWING WEIGHT OF BERLIN CARS IN TEST

Empty motor car (11 tons) + ballast (5½ tons)	16.5	metric tons or	36,300 lb.
Two empty trailers (7.22 tons each) + ballast (5¾ tons each)	24.94	metric tons or	54,868 lb.
Eight passengers and instruments	0.56	metric tons or	1,232 lb.
Total	42.00	metric tons or	92,400 lb.

By means of a switch within the car or by another one on the platform an emergency circuit of lamps can be thrown in in case of trouble with the lamps used for regular service.

Heat is supplied by electric heaters placed under the cross-seats and wired so they can receive either current from the overhead line or that generated by the motors when they are used as generators to brake the car. The heaters are designed so that the inside temperature of the car can be raised about 10 deg. C.

Each trailer is similarly equipped with heaters which are supplied with current from the motor car through a jumper cable.

WHEELS, JOURNALS AND BEARINGS

The car wheels have tread diameter of 720 mm. (28⅜ in.). All axles are made of nickel-manganese steel, containing 1 per cent nickel and 1½ per cent manganese. The wheel tires are of chromium steel and the wheel centers of cast steel.

The car journals are equipped with a double row of S.K.F. roller bearings, filled with a special grease lubricant which is claimed to give satisfactory service for one year without any attendance to the bearing. These bearings can be taken off readily when the wheels have to be taken out of the car when the tires are turned down. The roller races which remain on the journal are then temporarily inclosed to prevent injury.

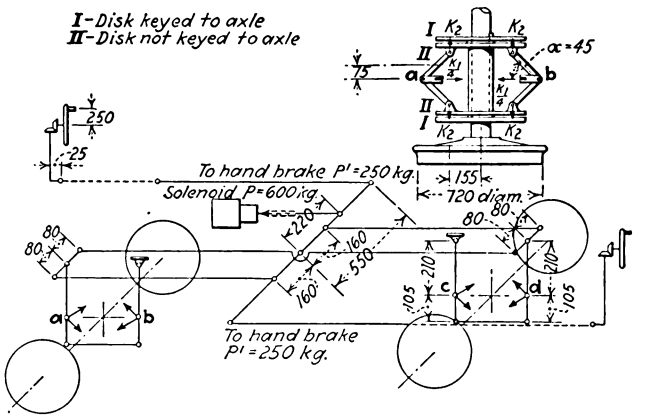
BAND AND DISK BRAKES

Perhaps the most novel feature is the mechanical brake with which both motor cars and trailers are equipped. This is entirely different from any brake hitherto used in Berlin and was necessary because, with the method of car body support adopted, the brakeshoes would have moved too far away from the wheels on a fully loaded car to function properly. It was therefore decided to design a brake rigging which would be independent of any movement of the wheels.

On the motor car this brake consists of a band operating on a drum attached to the armature shaft of the motor which has been extended on the commutator side to hold this drum. The drum, in turn, has been equipped with an inside band brake not greatly different in design from that used on automobiles. The brake-band lining is made chiefly of asbestos.

On the trailers the mechanical brake takes the form of a double disk brake in which a toggle joint on each axle presses two 10-mm. thick asbestos-lined plates against two circular steel disks with polished surfaces attached to the axle. This brake operates noiselessly and is very elastic, and the asbestos surfaces have been found to have a very long life. These brakes on the trailer are operated from the motor car by a solenoid mounted on the trailer and having a 600-kg. (1,320-lb.) pull and 90-mm. (3½-in.) stroke, or can be operated by hand.

These two brake systems have the great advantage over the commonly used brake that both braking and braked surfaces are away from the zone of street dirt and moisture, so that the friction coefficient is practically constant. They have the further advantage that they do not involve the use of pressures against one side of the journals and journal bearings and that by a simple arrangement of effective levers a very slight amount of power exerted by the motorman effects a very large braking action. In this way the brakes respond exceedingly quickly. Other advantages are the exact brake pressure equalization possible and a great saving in wear of wheel tires.



Weight of empty car 6,500 kg.
Passenger load 3,600 kg.
Weight of loaded car 10,100 kg.
Pull of the solenoid: P=600 kg.
Power on the circumference of hand brake wheel: P=25 kg.
Sum of the effective power at the points a, b, c, d of the toggle joints, K_1:
For the solenoid brake: $K_1 = 600 \frac{220 \times 160 \times 315}{320 \times 80 \times 105} \times 4 = 9{,}900$ kg.;
for the hand brake: $250 \times \frac{550 \times 160 \times 315}{320 \times 80 \times 105} \times 4 = 10{,}300$ kg.
Sum of the effective powers on the keyed disc, $K_2 = K_1 \times \text{ctg. } \alpha = 45$ deg.
Solenoid brake: $K_2 = 9{,}900 \times 1 = 9{,}900$ kg.;
Hand brake: $K_2 = 10{,}300 \times 1 = 10{,}300$ kg. Total braking pressure K:
Solenoid brake: $K = 9{,}900 \times \frac{155}{360} = \sim 4{,}262$ kg.;
Hand brake: $K = 10{,}300 \times \frac{155}{360} = \sim 4{,}400$ kg.
Percentage of braking power on empty car:
Solenoid brake: $\frac{100 \times 4{,}262}{6{,}500} = \sim 66\%$
Hand brake: $\frac{100 \times 4{,}440}{6{,}500} = \sim 68\%$
Percentage of braking power on loaded car
Solenoid brake: $\frac{100 \times 4{,}262}{10{,}100} = \sim 42\%$
Hand brake: $\frac{100 \times 4{,}440}{10{,}100} = \sim 44\%$

Double Disk Brake on Trailer with Braking Diagram

In addition to the mechanical brake described, the motor car is arranged for electric braking through the use of the motors as generators. When trailers are hauled, a part of the regenerated current from the car motors can be sent through resistances on the trailer or trailers for heating purposes, as already described. If trailers are not being hauled the brake circuit is automatically completed on the motor car.

Five hundred of the electric motors required for these 500 cars were supplied by the A.E.G. and 500 by the Siemens-Schuckert Works. The light-weight motors made by both of these companies are essentially alike, particularly in those parts which are subjected to wear, such as brushes, gears, axle bearings, gear casings and armature brake. This co-operation in design is considered a very essential step toward motor standardization. The motors have an hourly rating of

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34 kw. at 500 volts, 70 amp. and 770 r.p.m. Their continuous output is 24.7 kw. at 900 r.p.m. The weight of one motor is 780 kg. (1,716 lb.) alone, and 830 kg. (1,826 lb.) complete with accessories. The armature brake weighs 65 kg. (143 lb.), the armature 175 kg. (385 lb.), and the gear case 25 kg. (55 lb.).

All motors have roller bearings and commutating poles and are self-ventilating. With the introduction of high-speed motors, large savings were made in weight, cost and size. The use of these motors has made it possible to find room under the car for the new type of armature brake and permitted the use of small diameter wheels. The reduced weight of the wheels in turn reduced the upsprung weight on the rails and tends to reduce their maintenance cost.

All the light wires are installed in small wooden ducts above the window ventilators and are very easily accessible. The grounding cables are connected to both motor housings and thence to the axle to prevent the operating or braking current from finding its way across the roller bearings.

Tests on Speed and Current Consumption

Tests on speed and current consumption have been made with trains of one motor and two trailers in regular scheduled service. The cars were loaded with ballast equivalent to a full load of passengers as shown in the accompanying table.

The ballast used corresponds to a weight of about 75 passengers per car. The time taken for a run over the 14.679-km. (9.1-mile) long track was 52 minutes, including twelve-second stops at each stopping point. The current consumption was an average of 45 watt-hours per ton-kilometer (64 watt-hours per ton-mile). The moving resistance as measured by "run-out" tests was an average of 6.5 to 7 kg. per metric ton (13 to 14 lb. per ton of 2,000 lb.). The highest speed of the train weighing 42 metric tons was 32 km. (20 miles) per hour on the level, and for the empty motor car alone 41 to 42 km. (25½ to 26 miles) per hour.

Wheeling Wives Win Passes

ADDRESSES by A. C. Spurr, general manager of the Wheeling Traction Company, and Prosecuting Attorney A. C. Schiffler and the acceptance of eleven new members into the Veterans' Association featured the entertainment and dance given recently by the veteran employees of the Wheeling Traction Company, Wheeling, W. Va. The entertainment was one of a series that is staged by members of the Veterans' Association, made up of men in the transportation department who have been in the service of the company for twenty years or more. Following the program dancing was enjoyed by the several hundred couples present until midnight.

In his address Mr. Spurr declared that the transportation business was a partnership with employees, traction officials and the public served. He also spoke highly of the wives of veteran trainmen, to whom he referred as "silent partners," and said that it is his intention to present them with passes on all lines of the Wheeling Traction Company as an expression of appreciation for their efforts. He announced that passes would be mailed on Jan. 1 to the wives of all trainmen who have been in the service of the company for twenty years or more.

Bureau of Public Roads Issues Bus Statistics from Eight States

RECENTLY the United States Bureau of Public Roads, which is a part of the United States Department of Agriculture, made public an analysis of bus operation in eight states. It was compiled by H. R. Trumbower, economist of the bureau, and appears in the official publication of the department, entitled "Public Roads." The data from three of the states, Connecticut, Maryland and New Hampshire, were obtained from the records of the Public Service Commissions of those states. For the other states, West Virginia, Kentucky, Arizona, Oregon and Washington, the material was obtained from summaries published by the American Electric Railway Association.

FARES CHARGED BY INTERURBAN AND SUBURBAN BUS LINES IN CONNECTICUT, NEW HAMPSHIRE AND MARYLAND

Rate of Fare per Mile (Cents)	Connecticut Routes		New Hampshire Routes		Maryland Routes	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
2 to 3	2	4.2	1	3.1	1	3.1
3 to 4	7	14.9	4	12.5	6	18.8
4 to 5	21	44.7	3	9.4	11	34.4
5 to 6	11	23.4	7	21.9	13	40.6
6 to 7	3	6.4	2	6.3	1	3.1
7 to 8	3	6.4	1	3.1	..	....
8 to 9	..	....	1	3.1	..	....
9 to 10	..	....	4	12.5	..	....
10 to 11	..	....	2	6.3	..	....
12 to 13	..	....	5	15.6	..	....
15 to 16	..	....	1	3.1	..	....
18 to 19	..	....	1	3.1	..	....
Total	47	100.0	32	100.0	32	100.0

In these eight states there are 705 bus routes, which have a total length of 18,196 miles and an average length of 25.8 miles. Sixteen of these routes are 100 miles or more in length, but more than half of them are less than 20 miles in length. Of this route mileage, 41 per cent was directly competitive with the steam railroads, 28 per cent indirectly competitive and 31 per cent non-competitive. The author declares that motor bus and truck competition had very little or nothing to do with the recently announced policy of the Boston & Maine Railroad to abandon 1,000 miles of track and that this competition has been very limited.

Almost invariably the rates per mile charged by the bus operators are higher than the mileage rates of the competing railroads, indicating, in the opinion of the compiler, that the bus lines must have some superiority in service, such as a more direct route or more frequent service. Examples of both are given. A table of the capacities of the buses being used shows that 35.5 per cent have a capacity of from one to seven passengers, 25.3 a capacity of from eight to fourteen passengers, 34.2 per cent a capacity of from sixteen to 24 passengers and 5 per cent a capacity of 25 passengers or over. Two tables, one showing fares charged in three of the states and the other the motor bus fees and taxes in all eight states, are reproduced.

MOTOR BUS LICENSE FEES AND TAXES IN EIGHT STATES

State	Annual License Fee	Gasoline Tax	Total	Personal-Property Tax in Addition
Connecticut	$82.50	$71.42	$153.92	Yes
New Hampshire	276.00	142.84	418.84	Yes
West Virginia	666.67	249.97	916.64	Yes
Kentucky	270.00	214.26	484.26	Yes
Arizona	25.00	214.26	239.26	No data
Oregon	177.00	214.26	391.26	No
Washington	250.00	142.84	392.84	Yes
Maryland	1,428.57	142.84	1,571.41	Yes
Average	$396.96	$174.09	$571.05	.....

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The Readers' Forum

Manufacturers of Cars Can Be More Aggressive

WHEELING TRACTION COMPANY
WHEELING, W. VA., Feb. 5, 1926.

To the Editor:

You probably have been in a "crossroads" town and noticed the way the windows of the general store are dressed—the glass opaque, the articles antiques, the whole aspect unattractive—and they do business only with those who must trade with them.

In many parts of the country the street railways are still dressing their show windows (their cars) in the crossroads manner.

You have been calling attention to this forcibly and I believe that the street railway business as a whole echoes your point of view. Too many striking illustrations of modernizing have been called to our attention to permit us long to forget the fact that "To the quickest belongs the spoils."

If we were in the bus game entirely, our situation would be better. The motor vehicle salesman would be calling our attention to the need for new equipment, the possibilities of different types of equipment, new fields for our service, new types of service, and then offer to assist us in financing the venture. They seem to have realized that obsolescence deflects earnings and that modernization makes money.

Perhaps there are reasons for the optimism of the bus manufacturer, but with the possibilities that exist for the street railway business, some optimism should be reflected in its future by retiring the faithful carrier of the early days.

A. C. SPURR,
General Manager.

Great Possibilities for Improving Service Through Noise Reduction

AKRON, OHIO, Feb. 4, 1926.

To the Editor:

In the Jan. 23 issue of ELECTRIC RAILWAY JOURNAL there was a letter by "Master Mechanic" in which he feels that the work of the equipment committee toward improving the noise condition and general comfort of cars is a case of "Love's Labor Lost." It would seem from the tone of this letter that the work of maintaining the equipment and keeping expenses down to the limit had very much reduced his vision. It is a pity for any man running a railroad not to have a broad enough vision to see the possibilities of improving the service and keeping it up to the highest possible standards. It is true with all of us that we do not find the money growing on trees, but if the managements of most properties find that certain expenditures will produce results and profit, these managements usually will authorize the necessary expenditures.

It is true that there was no discussion of the very complete report of the sub-committee on noise reduction at the last A.E.R.E.A. convention, but I do not think that this indicated any lack of interest. This report was the last one to be read and the hour was so late that it was thought advisable not to start any discussion.

PIERRE V. C. SEE,
Chairman Equipment Committee.

An Opportunity for "Master Mechanic"

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY
INDIANAPOLIS, IND., Feb. 3, 1926.

To the Editor:

In your issues of Jan. 16, Jan. 23 and Jan. 30 I note some correspondence between the chairman of the committee on noise reduction and "Master Mechanic." I think "Master Mechanic" overlooks the function of various committees of the American Electric Railway Engineering Association. Certainly they are taking into consideration the greatest good for the greatest number and pursue their work along lines which will be of greatest benefit to the individual and the companies, and are not attempting to advise any one way how various properties may increase their revenues.

I believe also "Master Mechanic" overlooks the trend of thought and demand on the part of the public toward more luxury and comfort in the public conveyances which are used on our streets. The tremendous increase in the number of rubber-tired vehicles has more or less instilled the idea in car riders' minds that there is no real necessity for noise. This is the very problem the committee on noise prevention is trying to solve. It will point the way to master mechanics, truck departments and others. Certainly the committee is not attempting to advise in any individual case what should or should not be done, that being up to individuals to determine as the revenues of their properties may indicate. There is no question, however, that the investigation which the committee is pursuing in a practical, not a theoretical way, will tend, in the end, to do the two things regarding which "Master Mechanic" complains; that is, increase his revenue and decrease his maintenance expense. In addition, it will certainly increase the feeling of friendliness toward his company or his patrons, the car riders.

Should the entire membership of the association take the attitude toward the work of the committee which apparently is assumed by "Master Mechanic" there would most certainly be very little accomplished as to constructive progress in the industry. If "Master Mechanic" will make himself known, I, as a member of the executive committee of the A.E.R.E.A. and of many years' experience in committee work, would be glad to use my efforts to have him become a member of some of the committees in order that he might ascertain what is back of all their hard work and investigation. Such membership might be of material benefit to him.

It occurs to the writer that if "Master Mechanic" had not been so prone to the use of "Aladdin's Lamp" instead of putting forth individual effort his property might be in condition to adopt progressive recommendations.

WILLARD F. GRAVES,
Member Executive Committee A.E.R.E.A.

Anti-Glare Glass on Sheffield Cars

SO SUCCESSFUL has been an experiment with anti-glare glass fitted in front of some of the Sheffield, England, tramcars that it is to be adopted for all the cars in the city. The device consists of a sheet of blue glass fitted on a level with the motorman and a little to the right. Its purpose is to prevent the driver from being dazzled by powerful headlights on approaching vehicles.

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Association News & Discussions

Self-Propelled Cars and Locomotives

A. H. Candee Analyzes the Characteristics of Oil-Electric and Gas-Electric Driven Units—Advantages and Disadvantages of This Type of Equipment Stressed—Present Field Is Outlined

DISCUSSIONS by various manufacturers of the pros and cons of gas-electric and oil-electric operation of rail cars and locomotives have occurred quite frequently during the past month. Generally, however, it has not been possible to get a complete picture of the entire field. A broad analysis of the subject was made by A. H. Candee, general engineer of the Westinghouse Electric & Manufacturing Company, in an address before the Iowa Engineering Society at Mason City, Iowa, on Jan. 28. While optimistic for the future of the self-propelled motor car, Mr. Candee does not even suggest that it has approximated its ultimate state of development as yet. He rather shows that the gas-electric and oil-electric rail cars and the oil-electric locomotive have proved particularly efficacious in meeting certain localized conditions in railway operation.

One thing which has been very noticeable in development of the rail cars is the shrinking market for the smaller cars as the larger cars are brought out. Attempts have been made to determine the economical limit in engine size for this type of car, which seems to have been reached for the gasoline engine at about 250 to 275 hp. Larger engines will have some field, but will undoubtedly have to be built on an uneconomical production basis, as the Diesel engine will soon enter the field in the larger capacity.

According to the speaker the difficulties which arise in providing mechanical transmission in gear shifting of the larger gasoline-driven rail cars are no small problem and it has been demonstrated that electrical transmission is the only satisfactory system for the transmission of real power. Its advantages are:

1. Railway motors mounted on the trucks require only cable connections to the car body.
2. Gearing of motors to the axles is simple.
3. Power plant may be located at the most convenient place on the car.
4. Engine speed is independent of the car speed. This means that maximum engine power is available at all times for acceleration and for high-speed running, yet when the power required to maintain a given speed is lower than the maximum the engine speed may be lowered correspondingly. This increases engine life.
5. Simplicity of control.
6. Long life and low maintenance of the transmission as a whole.

For the propulsion of rail vehicles in recent years there has been a rather consistent effort on the part of Diesel engine designers to produce an engine to meet the requirements. The most noteworthy of these is the four-stroke cycle, solid injection engine, built by William Beardmore & Company, Ltd., of Glasgow, Scotland, and of which there are nine in successful operation on rail cars of the Canadian National Railways. This engine compares very favorably in size and weight with the modern gasoline engine and it weighs but 16 lb. per brake horsepower.

In considering the economies of the rail car for light passenger traffic or branch line service, Mr. Candee said, available data indicate that the comparative figures for rail cars using gasoline engines are from 25 cents to 45 cents, while Diesel engine cars will operate at figures approximately 25 to 35 per cent lower. Time will be required to verify this estimate, although there is every reason to believe that the maintenance of a Diesel engine in railway service should be lower than that of the gasoline engine.

Next the subject of the use of gasoline and Diesel electric engines for locomotives should be taken up. As in the rail car, the weight and space requirements of the Diesel engine have limited its use to sizes where real blocks of power have been required. Gasoline engines have been available for the smaller weights of locomotives and have been used rather extensively in industrial work. In continuous heavy duty, however, the fuel costs have been a severe handicap.

Both gasoline and Diesel engines have recently been used for switching locomotives. The available horsepower per ton on drivers has been much lower than in steam locomotives. These machines are more in the nature of experiments, or rather a step in development of the ultimate. Thus, the Ingersoll-Rand Diesel 60-ton locomotive has 5 hp. per ton and the 100-ton has 6 hp. per ton. The Brill-Westinghouse 75-ton switcher, using 500 hp. in gasoline engines, has 6.66 hp. per ton. Designs are now under way for locomotives having 8 to 14 hp. per ton weight on drivers. An electric locomotive can easily develop 25 to 35 hp. per ton. Steam locomotives can develop from 18 to 23 or 24 hp.

In service the low-power Diesel units with electrical transmission can develop more than enough tractive effort to slip the wheels and thus can haul immense trains, but the speed will be held to a very low value on account of the limited horsepower. To increase the speed it is necessary to reduce the tractive effort on account of the limited power available. Thus the time required to switch a given tonnage is relatively high as compared with steam switching.

One of the big problems of the self-propelled car or locomotive is that of providing power for the auxiliaries, such as radiator fans, air compressors, battery-charging apparatus, and engine starting. Direct connection of fans and compressors to the engine is not often desirable or feasible. With the electrical system of power transmission, electrical energy is available for the auxiliaries, but even then the problems are not all solved. The solution of the problem of varying voltage on the main generators has been solved in the case of the locomotives by the provision of an auxiliary generator having constant voltage characteristics, but with the rail car the use of an additional rotating machine is undesirable.

In concluding, Mr. Candee said, "I do

COMING MEETINGS OF *Electric Railway and Allied Associations*

Feb. 18 — A. S. C. E., A. S. M. E., A.I.E.E. and A.I.M.M.E., joint meeting, Engineering Societies Building, New York, N. Y., 8.15 p.m.

Feb. 24-26—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.

March 5 — Metropolitan Section, A.E.R.A., 29 West 39th Street, New York, N. Y.

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11 — Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

March 12 — Pennsylvania Street Railway Association, annual meeting, William Penn Hotel, Pittsburgh, Pa.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

Oct. 4-8—American Electric Railway Association, annual convention, location not yet determined.

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not wish to leave you with the idea that the gasoline or Diesel rail car and the Diesel locomotive are going to supplant the steam locomotive in the immediate future. Undoubtedly the rail car is developed sufficiently at this time to become the economical substitute for the steam locomotive in several classes of service. Locomotives equipped with internal combustion engines, however, have proved their desirability in but one class of service — that of light switching duty. As the ratio of cost between the Diesel locomotive and the steam locomotive is now quite considerable, the railroads will require conclusive demonstrations of the economies of a new form of motive power before they buy in quantities, and it will be many years before the intensively interesting and spectacular steam locomotive vanishes from our sight."

Canadian Convention Goes to Quebec

QUEBEC has been chosen for the 22d annual meeting of the Canadian Electric Railway Association. It will be held on June 2 to 4, inclusive. As in the last two years, the Canadian Electrical Association will hold its convention at the same time and at the same place.

While the exhibits and the majority of the entertainment features will be in common, the business sessions of the two associations will be entirely separate.

The following convention committees have been appointed:

Exhibits—O. C. Rehfuss, Canadian Car & Foundry Company, Montreal, chairman; C. H. Clancy, Toronto; J. A. Fletcher, Montreal; H. T. Gibbs, Toronto; W. J. Lynch, Quebec; Hugh Millar, Montreal, and C. F. R. Jones, Montreal.

Entertainment—R. B. McDunnough, chief engineer Quebec Railway, Light, Heat & Power Company, chairman; T. O. Burnside, Quebec; W. W. Horwood, Montreal; C. W. McMillan, Quebec; Norman Richards, Montreal, and H. E. Weyman, Levis.

From present indications there will be a fairly large exhibit, particularly of buses.

American Association News

Convention Location Not Decided

WHILE two meetings of sub-committees of the committee on location of the A. E. R. A. were held last month to investigate the possibilities of selecting Cleveland or Atlantic City for the annual convention it was not possible to get the full committee together at Indianapolis on Jan. 29, the date when the meeting was called. Accordingly no final report was made to the executive committee. Chairman C. E. Morgan, who was delayed en route, arrived in Indianapolis in time to make a short oral report, but without a recommendation as to the location of the convention. The statement in the calendar of *Bus Transportation* for February that the convention will be held in Cleveland was in error.

It is planned to hold a meeting of the committee on location during the coming week to take definite action. Since the executive committee finds it impossible to hold a special meeting for the purpose of approving a recommendation, a special committee with Mr. Morgan as chairman was appointed at Indianapolis with power to act. The complete personnel of this committee was published in the report of that meeting in the Feb. 6 issue.

Special Reports Available

SPECIAL reports have been prepared by the Bureau of Information and Service of the American Electric Railway Association and are available to member companies upon request.

Bulletin No. 64—Trend of Electric Railway Operations.—A month by month record of the revenues, expenses, taxes, car-miles, revenue passengers, operating ratio, etc., of a group of 154 companies for the months of January to November, 1925, compared with the same period of 1924. The combined figures for the group are followed by separate statements for each of the geographical divisions of the country. In addition the month by month record of operations of the group of 80 companies started in January, 1920, and published in bulletin form from time to time has also been brought through the month of November, 1925.

Bulletin No. 65—Motor Bus Legislation in 1925.—Contains complete copies of all motor bus regulatory legislation passed during the year 1925, with a carefully prepared analytical index, permitting easy reference to any section of laws. This bulletin supplements Bulletin No. 17, "State Regulation of Motor Bus Common Carriers," issued April 1, 1925.

Bulletin No. 66 — Trend of Trainmen's Wages.—Shows for a large group of companies the maximum wage rate, the number of years of service necessary to reach this maximum and the number of trainmen employed for the years 1914 to 1925 and as of Feb. 1, 1926.

Bulletin No. 67—Electric Railway Fares in 1917 to 1925.—Shows the fares in effect in 319 cities having a population of 25,000 or more, 1917 to Dec. 31, 1925. In addition it shows the average cash rate of fares in 272 cities in these same years and the number of cities in which each rate of fare was in effect in each of the years.

In addition to the above, supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies (Bulletin No. 68) have been prepared, bringing them down to date.

Metropolitan Section, A.E.R.A., Issues Attractive Leaflet

IN AN attractive two-fold leaflet, a direct appeal for new members has been issued by the membership committee of the Metropolitan Section to operating men in New York City and vicinity.

"You should belong" is answered by seven reasons: First, to learn how other companies handle their shop, car and street problems; second, to tell others how to solve problems, lending a helping hand, exchanging ideas for the mutual benefit of all; third, to learn of new practices constantly being developed by manufacturers and operators; fourth, promote your own welfare and the welfare of your company, to which you owe your best efforts; fifth, to receive the inspiration of frequent contacts with others in electric railway fraternities, both operators and manufacturers; sixth, to build a sound foundation for your own progress in the industry; seventh, to meet foremen, general foremen, dispatchers, motor instructors, superintendents, vice-presidents, general managers and presidents of other transportation companies.

President J. W. Hulme of the Metropolitan Section and R. F. Carbutt, chairman of the membership committee, are responsible for the leaflet. It was accompanied by a strong letter of appeal for membership.

In the first year of this section's activities 1,000 members were enrolled. This year a bogey has been set for 1,500, and from the enthusiasm exhibited and the quality of the meetings held the bogey should be exceeded.

Individual and Company Membership Increasing

NINE company members and ninety individuals were elected to membership in the American Electric Railway Association at the meeting of the executive committee held at Indianapolis, Jan. 29. The new company members include one operating railway, one associate and seven manufacturers. The names are given below:

Operating Company

Saginaw Transit Company, Saginaw, Mich.

Associate

J. K. Moore, consulting engineer, Chicago, Ill.

Manufacturer Companies

Braender Rubber & Tire Company, Inc., Rutherford, N. J.
Century Rubber Works, Cicero, Ill.
Cummings Car & Coach Company, Chicago, Ill.
Egyptian Lacquer Manufacturing Company, Inc., New York, N. Y.
Elliott-Fisher Company, New York, N. Y.
Selden Truck Corporation, Rochester, N. Y.
Ternstedt Manufacturing Company, Detroit, Mich.

The 90 individual memberships are divided as follows:

	Operating	Associate	Manufacturer	Total
Affiliated with member company:				
Accountants	4	..	..	4
American	14	3	25	42
Claims	2	1	..	3
Engineering	8	1	9	18
T. & T.	8	..	2	10
	36	5	36	77
Not affiliated with member companies:				
Accountants	1	1	..	2
American	..	..	2	2
Engineering	1	..	4	5
T. & T.	4	..	..	4
	6	1	6	13

The Truth About Local Transportation

UNDER this title a small eight-page folder has recently been issued by the publication department of the American Electric Railway Association. It contains interesting and helpful facts about the industry written by Mr. Storrs, the managing director of the association.

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Maintenance of Equipment

Chemical Mixture Removes Paint Quickly

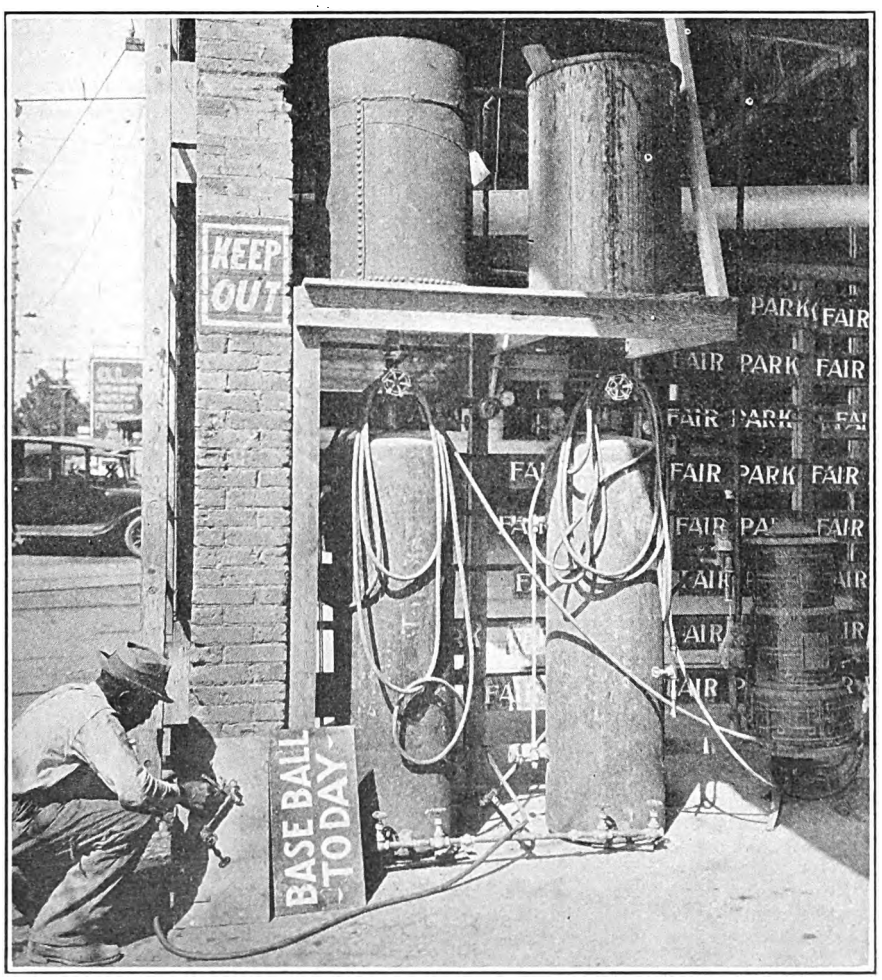
BY J. L. BROWN
Master Mechanic Dallas Railway

ECONOMY in removing paint from the exteriors and interiors of cars has been accomplished by the Dallas Railway by means of a special chemical mixture applied hot. Both the mixture itself and the apparatus used in its preparation were perfected by Dr. L. C. Moore, former city chemist of Dallas. Altogether there are four tanks, two above and two below. The bottom tanks are connected to a Pittsburgh heater, as shown in an accompanying illustration. The tanks on the left are used for mixing the paint remover, while those on the right are used in the preparation of a car-cleaning solution. An air compressor, not shown in the picture, is part of the equipment.

Eighteen pounds of a substance called Mooreite and 60 gal. of water are mixed in the left-hand upper tank and then allowed to flow into the left-hand lower tank. The mixture is forced from the lower tank by air pressure through the coils in the Pittsburgh heater to attain a temperature of about 175 deg. F. A small hose is connected to the outlet of the heater, and on the end of the hose is a small nozzle with a thumb valve. This arrangement permits the operator to handle conveniently the solution to be applied to the painted surface. A small stream is played upon the paint to be removed until it becomes soft and falls away from the surface. After the paint has been removed the entire surface is given a bath of clear water, which neutralizes the paint remover and prevents rusting of the metal.

The cost of removing paint from a double-truck car 45 ft. in length which has been painted every two years for the last eighteen years without removing the paint was $18.24. The cost for this same job using a paint remover for the steel and burning the paint off the wood with a blowtorch was $33.80. Thus, a saving of $15.56 was effected. The job included removal of the paint from the body inside and outside as well as from the wood seats.

To renovate and clean a painted surface without injury to the paint 2½ lb. of Westolite is mixed with 60 gal. of water. The same procedure of operation is employed as the paint-removing scheme. The old method of cleaning inside the car with hand brush and soap costs $2.94, as compared with $1.35 with the new method.



Apparatus Used by Dallas Railway for Cleaning and Paint Removing
Solutions are mixed in the upper tanks and allowed to flow into the lower tanks. From there they are forced by air pressure through the heater and then through the hose and nozzle.

Manganese Special Work Successfully Welded*

ONE of the major items of track maintenance on the lines of the Denver Tramway, Denver, Col., is the maintenance of special work. This has been reduced materially through the installation of solid cast manganese flange bearing special work, the use of hard center special work, and carbon steel flange bearing work hardened by a special process. The life of manganese special work has been prolonged in many cases through the use of surface welding. This welding has been made a success by chilling the weld very frequently. This is done by the application of water before cooling takes place.

While hard center special work is not considered as satisfactory as solid cast manganese, the company has some installed which requires

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

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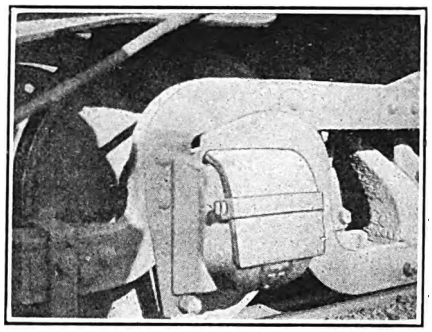
maintaining. This work consists of melting the old metal or babbitt with an acetylene torch with special scraper. Air from a portable air compressor is used for cleaning the center and the opening. An air pressure of 120 lb. per square inch is used to blow out foreign material. The center is removed and cleaned thoroughly and the pocket is dried by heating with a gasoline torch to prevent an explosion from steam formation while pouring in the new metal. In replacing the center, it is adjusted to the proper level by thin metal shims which are left in place. Antimonial lead has been found to give best results for resetting the centers on account of its characteristic of expanding as it solidifies and thus holding the center under pressure. A special sheet steel portable stove is used to melt the babbitt.

Journal Box Covers Clamped in Position

CLAMPS for holding journal box covers in the proper position are used in truck maintenance work by the Union Street Railway, New Bedford, Mass. Formerly the journal box covers often became loose and were sometimes lost. To overcome this difficulty, G. H. Bonner, shop foreman, devised a method to lock these covers securely in their proper places. It consists of a piece of ⅜-in. steel that is bent U-shaped and placed over the outside center of the journal box cover. This U-shaped piece is held in position by a ½-in. through bolt which passes from side to side through the



Strap Clamp Used by Union Street Railway to Hold Journal Box Covers in Place

journal box. Lock nuts hold this clamp firmly in position. Not only has this simple device eliminated lost journal box covers but it has held them so firmly in place that little dirt has found its way into the journal box and little oil has leaked out of the packings.

New Equipment Available

Novelties Incorporated in Design of Bus Bodies

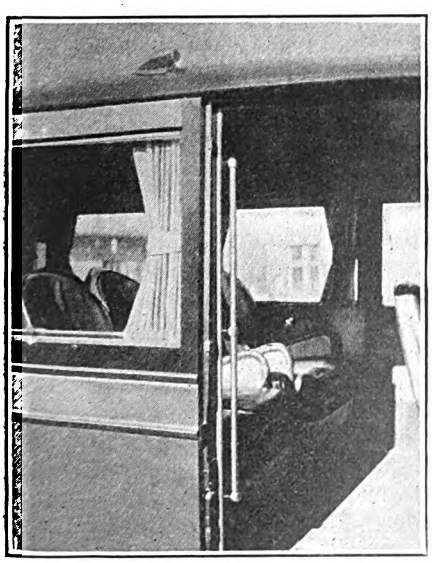
SEVERAL new features have been incorporated in the design of bus bodies recently built by the Lang Body Company. These will be mounted on International Harvester chassis and will be used in Florida. Particular attention has been paid to details affecting the width.

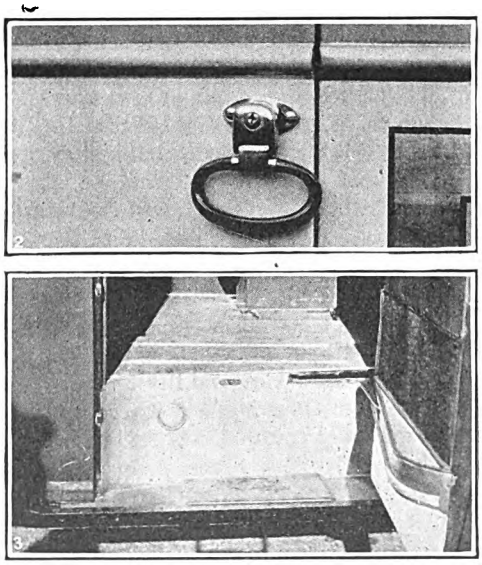
As anything which overhangs or projects from the side of the bus body adds to the effective width, the Lang company has designed a door handle which springs back flush with the side of the bus when not in use. When the handle is used it is raised and turned in the ordinary manner, but when released it immediately springs back close to the body. This handle is shown in one of the accompanying illustrations.

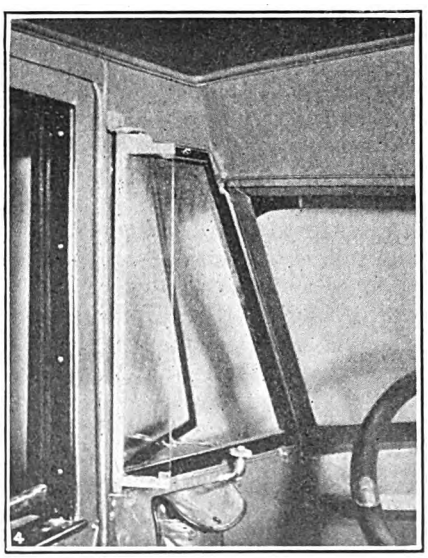
A grab handle has been placed conveniently alongside the entrance door, as shown in another of the accompanying illustrations. Its presence is a convenience for boarding and alighting passengers, and its location inside the body removes any temptation for the passenger to try to hold on while the bus is in motion. Placing the handle inside also tends to keep down the width.

An intermediate step between the ground and the floor of the bus is aranged in a well. This well is deeply rounded, allowing plenty of space for the step. A step light has been placed at one side and is operated automatically. The entrance door is made airtight by the use of rubber hose. This acts as a yielding washer when the door is shut.

Another new feature of this design is a wind deflector, which has been developed as the result of an idea secured from a bus driver. This driver was in the habit of sticking a piece of cardboard about 4 or 5 in. wide in the crack of the door at his left, bending the cardboard to such a position that when the wind blew in through the open front window it hit the cardboard and was deflected toward him. In warm weather this was a great relief. The wind deflector which has been installed on







Novel Features Incorporated in Recently Built Lang Bus Bodies

1. Conveniently located grab handle is mounted beside the entrance door.
2. Folding handle which springs back against the side of the bus to reduce the over-all width.
3. Rounded step well and rubber hose, which makes the door airtight.
4. Air deflector which throws the wind on to or off the bus driver.

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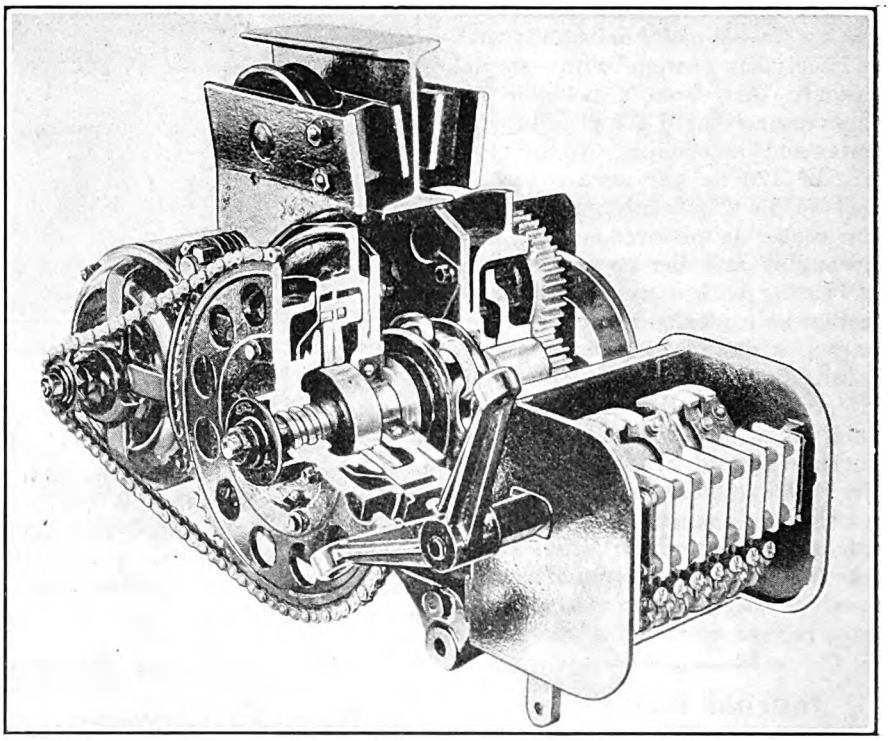
this body is of heavy plate glass, securely set in a polished nickel frame. The frame is attached to the side of the body at the driver's left, as shown in an accompanying illustration. It swings to any angle right or left, so that the driver may adjust it to derive the full effects of the breeze coming in at the front of the vehicle.

Ball Bearing Chain Hoist

LARGE chrome-vanadium steel ball bearings surrounding a massive steel load sheave reduce friction and give increased life to the Yale Model 20 B electric chain hoist just placed on the market by the Yale & Towne Manufacturing Company, Stamford, Conn. The heavy steel one-piece load sheave is ground on an arbor to give perfect concentricity for the ball races. It is bronze bushed for the driving pinion and is provided with splash lubrication to give a continuous flow of oil over the gears, pinions and bearings.

The driving pinion that passes through the load sheave is machined from a single drop forging, then heat-treated. The motor brake mechanism is provided with a large braking area, combined with heavy springs and strong supports to prevent over-travel in hoisting or lowering. The brake is operated positively by the controller handle. When the current is on the brake arms are lifted clear of the drum, so that there is no dragging or friction during the hoisting operation. When current is shut off the brake arms clamp tightly around the hoisting drum and produce a powerful braking action.

The load brake consists of a combination roller ratchet and the Yale-Weston friction disk mechanism. The roller ratchet resembles a huge roller bearing. The inner steel ratchet wheel is hardened and ground and carries six hardened and ground steel rollers, surrounded by an outer hardened and ground steel race. The load is held by the advancement of the steel rollers along the inclined wedge-shaped spaces. Small steel plungers force the rollers into a locking position the moment the hoist comes to rest. As these rollers are applied simultaneously around the entire circumference of the wheel they prevent any backward slipping of the load. The entire mechanism is continuously lubricated within an inclosed compartment.



Yale Model 20 B Ball Bearing Electric Chain Hoist

The design of the central steel suspension frame provides for rapid and easy change from trolley type to hook type hoist. The steel tie plates of the trolley are secured to the hoist suspension plates by two through bolts. These trolley side plates can be adjusted to fit I-beams of various sizes. When the hook type hoist is desired the trolley bolts and plates are removed and the hook and crosshead secured in central slots without the necessity of disassembling the hoist. When rigid suspension is desired both hook and trolley can be omitted and the suspension plate holes utilized in various ways for attachment to overhead construction.

A balance drive planetary transmission is furnished. With this type of gear system the tendency to thrust and wear the bearings apart is neutralized by the counteracting pressure due to the mesh of the intermediate gears with the internal gear. The gear housing is designed to provide a satisfactory splash oiling system.

Upper and lower limit safety stops are provided. These are mechanically connected with the controller and operate the drum brake when the load hook has traveled its limit in either direction. The current is cut off and the brakes are applied the moment the limit of travel is reached. The upper limit stop does not in itself provide maximum safety of operation, but when combined with the lower limit stop the protection is complete.

Malleable Iron Galvanized Without Embrittlement

OHIO BRASS COMPANY, Mansfield, Ohio, has developed a new metal which it has called "Flecto" iron. This is a type of malleable iron which, by virtue of a heat-treating process, is said to be freed from all tendency toward embrittlement when hot-dip galvanized. While retaining all of the desirable characteristics of malleable iron, the Flecto process so improves the metal with added valuable properties that it is considered to be practically a new metal. All malleable iron castings produced by this manufacturer during the past two years have been treated by this process.

Hot-dip galvanizing has long since been recognized as the best method of rust-proofing castings. However, ordinary malleable castings are frequently embrittled by galvanizing, and as a result, many substitute methods of rust proofing have been resorted to. Experience, however, has shown the great desirability of hot-dip galvanizing if the bad effect upon the iron can be overcome. This is said to have been accomplished in this new iron, whose main characteristic is that it always retains its malleable properties.

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The News of the Industry

New One-Man Cars for Milwaukee Demonstrated

Realizing that practical demonstrations are more potent than words, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., recently invited officers, merchants and the Councilman representing the territory to be served by one-man cars on the Walnut Street line to attend a demonstration trip, under typical operating conditions. The first of a number of new one-man cars which are to be introduced on this line were run on the trial under the direction of railway heads of the company. As a result one-man cars probably will be placed in service for six months, after which the case before the Railroad Commission in which opposition was raised to the use of the cars may be reopened.

The company plans to install 22 of the new one-man cars on this line, where seventeen are now operated. The adoption of a new shade of color embodying a deep shade of orange with ivory trimming will make it possible easily to distinguish them from the two-man cars, painted yellow. The cars will be equipped with suède seats instead of cane seats.

In explaining the extension of the use of the one-man car at the hearing in Milwaukee on Feb. 4, President S. B. Way declared that only through the economy afforded by one-man car operation can the present standard of service be maintained and that 300,000 fewer passengers were carried on the Walnut Street line in 1925 than in 1924. The purpose of the company was to disprove the city's contention that growth of the district served does not necessarily mean increased patronage and business for the company. In spite of increase in population railway earnings in Milwaukee during 1925 were $100,000 less than in 1924.

At the close of the hearing the commission announced that it reserved decision on the question of reopening the case.

Greater Differential in Fares Sought in Louisville

The Louisville Railway, Louisville, Ky., which on Feb. 1 put into effect a straight 7-cent fare, instead of a 7-cent cash fare with a 6-cent ticket fare, is now asking a cash fare of 10 cents, with tickets at fifteen for $1, or slightly under 7 cents, for a trial period of two years. It is contended that Louisville's rapid growth demands extensions of service which cannot be taken care of without an income sufficient to enable the company to market securities with which to secure funds for improvement of service. The new industrial district along the riverfront in the western section of the city has no street car connections and no prospects, unless funds can be secured to take care of the necessary installations. In the last few years there has been a rapid growth of the city toward the southeastern section, or Highlands, which has only one car line, while there is also need of new lines in the eastern section.

A tentative memorandum has been presented to the city by Churchill Humphrey, counsel for the company, and tentative ordinance terms have been given to the press by Mr. Humphrey and President Barnes, with the consent of the Mayor. The plan is to abrogate the old ordinance and create a new one, if the Council should favor the proposal.

A census completed in December by officials of the federal bureau showed a 77,000 gain in Louisville for five years, bringing the total up to more than 305,000 inhabitants, with great gains in the suburbs.

It is urged that the variance between cash and ticket fares is in favor of regular riders, who will profit by a low fare, whereas the transient and casual patrons would pay more. The working man or woman would pay less than at present, but those who contribute to the company's income only in an emergency would be penalized under the new proposal.

Franchise Question in Kansas City, Kan.

Pledges Sought from Reorganized Company Regarding Proposed Railway and Bus Services—Adequate and Better Service Promised to City Commissioners

PRESIDENT NESSELRODE of the Kansas City (Kan.) Chamber of Commerce in the first week of February appointed a committee to keep in touch with matters pertaining to the proposed franchise for the Kansas City Public Service Company, which bought the properties of the Kansas City Railways at foreclosure early last month. If the sale is approved, the new company will succeed the Kansas City Railways in the operation of the property.

The committee has recommended that the application for a franchise to operate street cars and buses in Kansas City, Kan., should be heard by city officials before a separate franchise for the operation of an independent bus system is awarded to private interests. The committee has further indorsed Frank J. Ryan, Secretary of State, in holding that the Kansas City Public Service Company should make known its intentions for the improvement of transportation facilities in this city before a state charter is granted to the company.

The services of the committee have been offered to Mayor Gordon and to William G. Woolfolk of the service company. It is stated that the committee is interested only in procuring for the city service to which its residents are believed to be entitled.

Although the sale of the railway property has not yet been approved by Judge Kimbrough Stone, referee, the Kansas City Public Service Company applied some time ago for a charter to operate in the state of Kansas. The company was refused a charter by the board on Jan. 21, on the grounds that the company had failed to specify the sort of service Kansas City, Kan., would be given. At the time of the hearing, officials of that city appeared before the board in Topeka and fought the issuance of such a charter. A hearing has been called for Feb. 17 at Topeka, when a new application for a charter will be considered.

Confirmation of the sale at auction of the Kansas City Railways by Judge Stone is expected some time in March. If and when the sale has been approved by Judge Stone, the control of the properties will immediately pass from the present receivers to the Kansas City Public Service Company, which represents the first mortgage bond holders of the old company organized to bid in the property at foreclosure.

Under the receivership, the railways company has been operating without a franchise in Kansas City, Kan., but it was explained that, were a private company to operate under similar circumstances, every member of that company would be liable for damages resulting from accident and other suits.

During the meeting at Kansas City, Kan., on Feb. 5, it is understood that Mr. Woolfolk gave Mr. Ryan and the city commissioners no definite promise as to the sort of service that city may expect in the event the sale of the properties is approved.

He is said, however, to have stated that service on the whole will be quite adequate and better than that rendered in the past.

Mr. Woolfolk expressed the probability, if a charter is granted, that the new company will place two bus lines in operation on the Kansas side. One line is tentatively planned to run from City Park and the other from State Avenue, both from Kansas City, Kan., to Kansas City, Mo. It was also promised tentatively by Woolfolk that service over the Twelfth Street viaduct, between Kansas City, Mo., and the Argentine district of Kansas City, Kan., would be resumed.

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Street cars can reach the Argentine district only over that viaduct. The railway now operates a bus line over the Goddard Avenue viaduct, but passengers who do not wish to pay a 10-cent fare are forced to walk across the bridge to the other side, where they must board another street car and must transfer a second time in order to reach the business district of Kansas City, Kan.

C. D. Darnall, water and light commissioner, told Mr. Woolfolk that bus lines are not desired by residents of the Argentine district. Mr. Woolfolk promised to make a personal study of the situation in that district at an early date.

TALK OF COMPETITIVE BUSES

W. D. Pratt, local financier, a few months ago offered to establish a bus system in Kansas City, Kan., and submitted a tentative list of lines to be operated to the city commissioners, requesting a franchise. He did not ask that street cars be excluded from that city. The commissioners have delayed any definite action on his proposal until a final decision is reached by the Kansas charter board in connection with the charter for the Kansas City Public Service Company.

Apparently no agreement was reached during this latest meeting and, after setting the date for the later hearing in Topeka, Mr. Ryan returned to the capital soon after the close of the meeting.

Contract for Mozart Hill Line in Wheeling

Prospects of having the Wheeling Traction Company, Wheeling, W. Va., assume charge of the Mozart Hill line, a subsidiary of the Wheeling Public Service Company, loomed when the City Council of Wheeling adopted on Feb. 3 a contract to be presented to officials of the traction company. The contract as drafted makes many concessions as to the present franchise of the Wheeling Traction Company. The various franchises will be consolidated and unified if the contract is found favorable.

The proposition is that the Mozart Park Traction Company will be formed to serve in the capacity of a subsidiary. In exchange, the city of Wheeling, which has been operating the line since it was abandoned several months ago, will turn over all equipment for the consideration of $1. The Mozart Park company will be permitted to operate the line for a period of 75 days, and in that time, if it is found that the operation is unprofitable, the line may be again turned back to the city. The same fare as is in effect at present will be compulsory and the street cars will run between Twelfth Street and Mozart Hill, as was formerly the custom when the system was in charge of the Wheeling Public Service Company. The line will also come under the jurisdiction of the State Public Service Commission.

In connection with the operation of what was formerly a part of the City Railway system, City Manager Harvey L. Kirk in a monthly report to Council announced that during the past two months net earnings by the road had been $1,140.

City Approves Seven-Cent Cash Fare for Dallas

Increased fares for the Dallas Railway, recommended to the Council by J. W. Everman, supervisor of public utilities for the city, have been approved by the City Commission. It is his idea that the cash fare should be 7 cents with five tickets for 30 cents, with half fare and half tickets for children and school students and free universal transfer. As Mr. Everman sees it, this plan will not work hardship upon the regular riders, citizens of Dallas, as, by purchase of tickets or tokens, they will ride at the same rate as now in effect. Up to Feb. 6 the railway had not indicated its intention regarding the matter, but it was believed the company would accept the proposal. Mr. Everman says:

The 7-cent cash fare will bring increased earnings from those car riders who, of their own choice, pay the cash fare rather than purchase tickets. The 6-cent ticket fare, purchased in lots of five tickets for 30 cents, will not add to the living costs of the Dallas citizens and will be an encouragement to regular riders to purchase the tickets, thereby benefiting the company in the way of cash advanced ahead of service, more rapid movement of street cars (inasmuch as the majority of passengers will be provided with tokens or tickets), saving time making change, etc.

Mr. Everman says that for the increased fare and other considerations the Dallas Railway should be required to secure and expend new money to the amount of $1,000,000, and also to expend from the reserves for replacements the sum of about $450,000.

Mr. Everman says the Dallas Railway should agree to place an order immediately for 30 Peter Witt cars. He also says that the company, upon its acceptance of the terms and conditions of the plan, should exercise diligence in carrying out the work, promptly authorizing the City Commission to instruct paving contractors to proceed with the work of paving streets which have been, or are to be, ordered paved, as set forth in the plan, the expense of which pavement is to be partly paid by the Dallas Railway. He wants all orders for all material required for extensions placed promptly.

Mr. Everman said:

In my negotiations with the Dallas Railway the officers have expressed their desire, both now and for the future, to co-operate with your honorable body in every possible way leading up to the furnishing of a first-class transportation service for the city of Dallas, and to this end to furnish $1,000,000 new money and approximately $450,000 from reserves and to extend same to improve the property as outlined in this plan, pushing the work with all dispatch consistent with economical business methods, completing the entire plan promptly so as to give the Dallas car riders the improved service with as little delay as possible, and further to work in close harmony with the City Commission to take care of the future street car needs.

He wants this plan with the increased fare made effective immediately.

$55,000,000 Construction Budget in New Jersey

Approval of the 1926 construction budgets of public service operating companies, including Public Service Electric & Gas Company, Public Service Railway and Public Service Transportation Company, brings the total amount now authorized to be expended on the improvement of electric, gas and transportation facilities in the territory served by these utilities up to approximately $55,000,000. New authorizations for 1926 total more than $18,000,000. Construction projects already approved and to which the companies are committed make up the rest.

The completion of the great Kearny electric generation station and the Harrison gas works are the biggest single items in the program of the Electric & Gas Company, while for the railway, an order for 333 gas-electric buses, said to be the largest single order for buses ever placed at one time, heads the list.

More than half of the construction budget of the railway will be used for track reconstruction. In addition to the 333 gas-electric buses, previously provided for, the company appropriations cover new garage facilities at Camden, Hackensack and Elizabeth.

Electrification of Railroads Must Go On

Samuel Insull, president of the Commonwealth Edison Company, Chicago, in addressing the Boston Chamber of Commerce, said:

One branch of electrification must go on—that is, the electrification of the steam railroads. Only about 1 per cent of the steam railroads of the United States are electrified today. Of the 250,000 miles of steam railroad, I do not think there are more than 2,500 miles electrified. Steam railroads consume somewhere between 150,000,000 tons and 180,000,000 tons of coal a year in their operations. The figures of what they would require if electrified are so small and the saving is so great that I almost hesitate to quote them. These savings vary from about 100,000,000 tons of coal a year to 140,000,000 tons of coal a year, depending somewhat upon the conservatism of the statistician who does the figuring.

I do not mean to suggest for one moment that all the 250,000 miles of railroads in the United States can be electrified, but certainly, where there is great density of population, great density of manufacturing, and consequently great density of tonnage, they should be electrified. From the experience of electrification of the New Haven road, there should not be a steam locomotive running between Boston and New York today.

F. I. Fuller Praised by Portland Papers

Franklin Ide Fuller, first vice-president of the Portland Electric Power Company, Portland, Ore., who died on Dec. 16, was a real, constructive force in the affairs of that city. Account of this fact was taken by the Portland papers, particularly the Portland *Telegram*. That paper said editorially:

To the moral and physical growth of Portland, F. I. Fuller contributed his share. Coming here about the time Portland was discarding swaddling clothes, he grew up with the city and from the year of his arrival took an active part in its growth. Modest and unassuming in his personal and public actions, Mr. Fuller never attracted the attention many of lesser worth received, but no man with a record of 40 years of clean, upright living in a community, where tangible evidence of his moral and physical accomplishments is ever present, can entirely hide his light under a bushel.

For this reason his passing will be mourned and regretted, not only by those who worked with him in the building of the young commonwealth, but by thousands who now and in years to come will enjoy the benefits of a better Portland which Mr. Fuller helped to make.

As noted in the ELECTRIC RAILWAY JOURNAL for Dec. 19, he had been identified with the Portland Company and its predecessors since 1892.

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8-Mile Road in 16,000 Town Attracts Attention

The right kind of spirit, co-operation and good fellowship was manifested recently, said the Berlin *Reporter*, Berlin, N. H., of Jan. 21 when the management of the Berlin Street Railway gave a banquet to its employees at Georges.

The interior of the room was decorated to suit the occasion, namely, to represent a street car. As one approached this room or car he was confronted with a metal blue sign that said "Car stops here," and near at hand was another, "Parking 30 minutes only." Inside was a regular carfare register, and bells completely installed, together with other street car signs, made it look like a real street car and was very appropriate. The people inside did not show much respect for the "No smoking" signs, but thought the refreshments were very satisfactory.

After the train order was run through and the fuel and ballast were put away and the headlights were shining brightly the men expressed their appreciation for the kindness shown them by the Berlin Street Railway.

Later a reporter visited the manager. He stated that the Berlin Street Railway feels that it is most fortunate in the high type of men in its service, in their devotion to public service and in the good relations that exist between the management and men.

The company is a strong believer in the principle that the public is reasonable, and even generous, when it is truly acquainted with the conditions and problems of the street railway.

The *Reporter* said:

> We wish to congratulate the officers of the Berlin Street Railway in their get-together banquet. This is a very good policy and leads to good results. A few years ago complaints in regard to the Berlin Street Railway were numerous, both in this newspaper and on the street. With their record of service as given to the public at the present time, they should be receiving at least 25 compliments to one of an adverse nature.

Jacksonville Votes on Railway Issue April 13

Voters of Jacksonville, Fla., will decide on April 13 whether they desire to own the Jacksonville Traction Company. This date was set by the City Council on Jan. 11 for the special election at which a $4,000,000 improvement program will be submitted to the people for approval. The election will determine whether the city shall acquire the railway by purchase. No mention will be made on the ballot of the price to be paid by the city.

Situation in Shreveport Acute

The Shreveport Railways, Shreveport, La., continues to face a crisis of inadequate revenues on account of a low rate of fare. The rate for adults is less than 6 cents. The company has asked the Public Service Commission for permission to increase its fares slightly to net sufficient to cover operating expenses and leave a small margin of profit. This petition is now pending. In addition to that precarious position, a jitney ordinance adopted by the City Council of Shreveport has resulted in only diminishing the number of jitneys. The Shreveport Railways system last year carried more than 11,000,000 passengers, counting adult fares, school children and transfers.

Chautauqua Institution Refuses to Finance Line

The executive board of Chautauqua Institution, at a meeting at Albany on Jan. 30, expressed the opinion that the institution would not be warranted in investing its funds in aid of the Chautauqua Traction Company with a view to continued operation of the line beyond the 60-day period arranged by the school authorities. The executive board approved the action of officers in agreeing that Chautauqua Institution pay to the school board of the Chautauqua school district No. 3 one-half of such deficit as may arise in the emergency and modified operation of the trolley line, in accordance with the guarantee agreement of the school board with the Chautauqua Traction Company, provided this sum does not exceed $1,500 over the 60-day period from Jan. 11, 1926. The officers of the institution and the trustees did not anticipate that the abandonment of the railway would have a serious effect upon the attendance at the institution or upon the convenience of its summer patrons. The institution stated that arrangements would be completed as soon as possible for readjusting the passenger, baggage and freight facilities for the changed conditions. The agreement to continue the line for 60 days has been referred to previously.

Would Make Tax Value Basis for Rates

A bill in relation to fixing rates, fares and charges to be exacted by public utility corporations has been introduced in the Senate and Assembly by Minority Leaders Downing and Bloch.

The bill adds a new section, 24-A, to the public service commission law and provides that the commission shall consider the assessed valuation of the properties of the company upon which their income, franchise, corporation and other taxes are based as such information is filed with the State Tax Commission in fixing any rate, fare or charge. It also provides that the commission may go back to all decisions rendered since Jan. 1, 1921, and reopen the same, and may give consideration to the assessed valuation of the properties of the corporations. The Tax Commission is required under the provisions of the bill to furnish all information in its possession to the commission, such information now being confidential and not available to the rate-making body.

News Notes

Rehearing on Track Work Denied.—The Public Service Commission denied on Feb. 8 the petition of the International Railway, Buffalo, N. Y., for a rehearing on its recent order directing certain track reconstruction work to be done in Buffalo.

Hearing Set on Utica Increase.—A hearing will be held before Chairman William A. Prendergast of the Public Service Commission at Albany on Feb. 17 on the petition of the New York State Railways for permission to charge an increased fare in Utica and vicinity. The company now is charging 7 cents. The petition asks permission to charge 10 cents cash or ten tickets for 75 cents.

Thrift Ideas to Be Rewarded.—The Southern Public Utilities Company, Charlotte, N. C., will offer three prizes of $5, $3 and $2 respectively to its employees for the best thrift letters to be published in the February number of the Southern Public Utilities Company's magazine. The letters should relate to a practical thrift problem.

Offices Moved.—Executive offices of the International Railway, Buffalo, N. Y., are to be moved from the Littell Building at Franklin and West Huron Streets. The main executive offices will be taken to the D. S. Morgan Building, but the claims department will be shifted to the Virginia Street carhouse in Main Street. The new locations will save the International Railway a large sum of money in rentals each month over those now paid.

Fare Increase Sought in Ironwood.—The Lake Superior District Power Company has asked the City Commission of Ironwood, Mich., to join with it in submitting a proposal to the Public Utilities Commission for adjusted street car rates in Ironwood. The City Commission will take action after giving Walter Hodgkins, general manager of the company, a hearing. According to an audit, submitted by the company, the net deficiency for the year just ended was $48,928 when consideration is given to interest on investment at 4 per cent, operating expenses and depreciation on property of 3 per cent. The company, about two years ago, rehabilitated the system in Ironwood at an expenditure of $221,465 and during 1925 was $19,749 short of meeting its operating expenses. It is now operating with a 5-cent fare in Ironwood and a 6-cent fare in Hurley, Wis., just across the state boundary.

Remodeled Cars Given Trial.—The first of 24 street cars of the Indianapolis Street Railway, Indianapolis, Ind., being rebuilt and equipped with devices so the cars may be operated by one man has been given a trial run. The cars will be equipped with stop lights in addition to other features. Passengers enter from the front but leave by the rear. When the rush hours come it will be possible for a conductor to stand at the door, collect the fares quickly and then alight and let the car proceed as a one-man car.

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To Pay with Check in Louisville.—As a protection to the paymaster and the employees themselves, the Louisville Railway, Louisville, Ky., will hereafter pay its trainmen by check instead of cash. The notice announcing the change refers to the risk from highwaymen as well as the likelihood of losing the money.

Sunday Pass for Allegheny Valley.—The Allegheny Valley Street Railway, a subsidiary of the West Penn Railways system, was to install an unlimited-ride transferable Sunday pass for 50 cents effective Feb. 7. The pass will be available for any and all of the eight zones between Aspinwall (Greater Pittsburgh) and Natrona. Operation of this railway, however, is divided into a six-zone division between Aspinwall and New Kensington and a two-zone division between New Kensington and Natrona. The standard fares are 8 cents cash and 6¼-cent tickets per zone, but there is also a variety of commutation rates.

Opening of New Systems into Yonkers.—The first train was run into Yonkers, N. Y., on Feb. 7 on the recently electrified Yonkers branch of the Putnam Division of the New York Central Lines. A committee headed by Mayor William A. Walsh met the trains.

Fifth Traffic Plan Submitted in Baltimore.—The Baltimore, Md., Traffic Survey Commission held its final public hearing on Feb. 3 for the discussion of plans to reroute some of the lines of the United Railways & Electric Company. The four plans submitted by Kelker, De Leuw & Company, Chicago experts, were considered and a fifth plan was submitted to the committee. The new plan was prepared by the Retail Merchants' Bureau of the Baltimore Association of Commerce and several of the various trade organizations in the downtown section of the city. This plan was drawn with the view of eliminating some of the objections which were voiced at previous hearings and is to be considered by the commission in preparing its final draft.

Aid of Merchants Enlisted. — The question of transportation and traffic in Jamestown, N. Y., and vicinity was discussed at a dinner given by officials of the Jamestown, Westfield & Northwestern Railroad for 250 manufacturers and merchants of Jamestown on Jan. 25. Robert H. Jackson, one of the three administrators of the estate of the late Sheldon B. Broadhead, set forth in detail the serious financial situation which confronts the Jamestown, Westfield & Northwestern. He made a plea for increased passenger business and suggested that merchants divert to it a share of their freight business under the through freight rates established by the Jamestown, Westfield & Northwestern in connection with the New York Central Lines, the Pennsylvania Railroad and the Nickel Plate Road. Some few years ago the Jamestown, Westfield & Northwestern Railroad suffered a decline in its interurban passenger business and in the hope of recouping its losses in 1923 started a through system of freight handling. The plan was outlined in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 21, 1925, page 924.

Recent Bus Developments

Another Bus Report in New York City

With a recommendation that the Board of Estimate and Apportionment first determine a policy of awarding omnibus franchises on a basis of either city-wide, borough-wide or system operation, on the best possible terms for the city and satisfactory service to the traveling public, the Board of Transportation of New York City has filed with the Board of Estimate its fifth report on pending applications for bus grants.

The board makes no recommendation as to which of the petitioners should be granted a franchise, as it was not directed to do so by the Board of Estimate, but it is prepared, the report states, to make such recommendations, without delay, if the board so desires.

The report restates a summary of facts as to previous applications and as to nine new or amended applications for franchises to operate bus lines. It again points out the necessity for securing satisfactory service at a 5-cent fare as far as possible.

The report favors a franchise grant borough-wide in area or by systems made up of contiguous territory, where most of the travel is in one community, or between areas that are developing as communities.

New Haven Operates Buses Over 777 Miles of Road

President Pearson of the New York, New Haven & Hartford Railroad announces that the railroad is now operating buses over 777 miles of road and in addition to this is operating gasoline rail cars on 567 miles of rail. He says that in the development of modern transportation, automobile operation over the public highways has become a factor. At the beginning there was some doubt in the minds of the railroad officials whether the New Haven Railroad could afford, in view of its limited financial condition, to invest in this new transportation facility. As time went on it became apparent the company must be in a position to protect itself from further diminution of revenue through the taking away of passengers by automobiles. In many instances, he says, the beginning of highway operation by the railroad means better transportation service for communities than they ever had before. Until Mr. Pearson made this statement there was little realization on the part of the public of the extent to which the railroad had gone in its plans for coordinating steam, electric railway and bus transportation.

Date Set for Hearing on Buffalo Buses

Tameling, Keene & Company, New York, who are said to have completed plans for financing the 5-cent bus service in Buffalo for which Ernest M. Howe, Detroit, has secured a franchise from the municipal authorities, have informed the New York State Public Service Commission that all details of the plan will be outlined to the commission on Feb. 15. The state utilities board previously had granted two adjournments to Mr. Howe and his associates so the financing plans could be worked out.

Opposition to the Howe lines will be entered by the Buffalo Chamber of Commerce, the Buffalo Federation of Business Men's Associations and the International Railway, which is operating three bus routes in Buffalo under a subsidiary, the International Bus Corporation. The opposition contends that the 5-cent buses to be run over thirteen routes covering 71.5 miles of operation will have a very serious effect upon the local railway, which operates on an 8-cent fare or two tokens for 15 cents. The proposed bus routes would parallel many of the existing car lines.

Missouri Commission Cannot Rule on Bus Fares

The Missouri Public Service Commission ruled on Feb. 2 that it had no jurisdiction over bus lines operated in the state and under the public service law was without power to regulate such utilities. The decision was on the application of the Springfield Traction Company, Springfield, Mo., which had sought permission to increase bus fares from 5 to 7 cents to conform to the fare charged by its street cars. The application was filed on Dec. 16, last. The petition pointed out that the buses were operated at a loss of $49,003 during the period Sept. 1, 1924, to Sept. 30, last.

The application was the first of its kind ever received by the Missouri Public Service Commission. It was thought that the commission might have jurisdiction because the buses are being operated in conjunction with the railway system. The Springfield Traction Company has exclusive bus rights in Springfield under a city ordinance.

Many Applications for Bus Rights in Brooklyn

Applications of fourteen companies for franchises to operate bus lines in Brooklyn were submitted on Feb. 1 to the Board of Estimate of New York City by its division of franchises and considered by the board in committee of the whole. Action was deferred until the committee meeting on Feb. 15 to give the members time for consideration. The question of bus operation is closely allied with the general transit problem and will be considered by Mayor Walker in his conferences with the members of the Transit Commission and the Board of Transportation. So far as is known none of the companies is affiliated with any of the railways operating in the territory to be covered by the routes of the applicants.

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Twin City Company Expands in Bus Field

The Twin City Rapid Transit Company, Minneapolis, Minn., through its subsidiary corporation, the Twin City Motor Bus Company, now owns all the bus lines carrying passengers between Minneapolis and St. Paul, in addition to some suburban routes. This has been accomplished by the purchase of the third and last interurban bus line, the Minneapolis & St. Paul Bus Line, Inc., operating twelve buses. With the Twin City Motor Bus Company line and the American Auto Transit Company line, previously acquired, the railway now operates buses between the Twin Cities on three major traffic routes.

The Twin City Motor Bus Company is putting seven new buses in service on interurban lines. The bodies, built at the Eckland Body Company shops, are on Mack (International) chassis. The railway company now has 84 buses.

Net revenues on the buses over the 7½ per cent return allowed on the railway investment will be turned over to the street car companies. Thus the railway has taken over bus lines that were eating into the revenues of the electric companies and may get additional revenue from the bus lines.

Indiana Decisions Apparently in Conflict

The Superior Court at Terre Haute, Ind., has handed down a decision upholding the state law enacted by the last Legislature providing that buses operating in cities must secure certificates of necessity and convenience from the Indiana Public Service Commission. The ruling came on the hearing of a petition of the Terre Haute, Indianapolis & Eastern Traction Company for an injunction against nineteen bus operators. Counsel for the bus men argued that a license issued by the City Council was a contract which took precedence over the state law, but the court ignored this construction of the statute. The railway also asked for an accounting from the operators and a judgment for the sums that were received by them for carrying passengers since the passage of the new law.

At about the same time came another decision from Hammond, Ind., in the Lake County Superior Court of a somewhat different nature. The court ruled that certificates of the Public Service Commission permitting operation of buses within cities cannot supersede city ordinances. The opinion denied the petition of the Gary Street Railway to enjoin the city from enforcing an ordinance prohibiting such transportation. The court held that cities have an inherent right to regulate transportation facilities within their own limits.

Permission Sought for New Line.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., recently applied to the Public Service Commission for permission to remove its tracks from Race and Vine Streets between Second and 23d Streets, Philadelphia, to make room for an authorized bus route. Commissioner Benn, who heard the application, said he would recommend approval. The commission rejected a similar application several months ago because of a clause in the councilmanic ordinance covering the city and the P. R. T. agreement which would have given the railway the exclusive right to operate over these streets. That clause was eliminated in the application presented on Feb. 4. The company also applied for permission to establish a bus route to serve East Germantown and Logan.

Boston Bus Line Extended. — The Boston Elevated Railway, Boston, Mass., has extended its bus line being operated between Kendall Square and Bowdoin Square to Lafayette Square. This change in routing became effective on Feb. 1.

Line Discontinued—Would Run Buses.—The Grand View Railroad, a 6-mile line in Kirkwood, near St. Louis, Mo., has been discontinued. The St. Louis Bus Company, a subsidiary of the United Railways, has asked the St. Louis Board of Public Service to substitute buses for the cars. The route the bus company would operate is 2 miles. The buses would connect with the Broadway and Bellefontaine Street car lines.

Petitions for Bus Substitution.—The Menominee & Marinette Light & Traction Company has petitioned the Marinette, Wis., Common Council to replace its Hall and Pierce Avenue street cars with buses. In presenting the company's case before the Council, A. J. Goedjen, general manager, stated that traffic on this line was only about 75 per cent of the figures established three years ago and that the line had shown no profit in 1925.

Bus Line Serves Useful Purpose.—The Portland Electric Power Company, Portland, Ore., is putting on transfer buses to serve the Eastmoreland district and Reed College, joining the Error Heights car line and others. The run is about 2 miles. The bus line eliminates the railway traffic on a one-way viaduct.

New Line in Northwest St. Louis.—The St. Louis Board of Public Service on Feb. 2 voted unanimously to grant a permit to operate a bus line in Northwest St. Louis to the St. Louis Bus Company, a subsidiary of the United Railways. The bus line will use Natural Bridge, Marcus, Kingshighway Northeast and Florissant Avenues, and will provide transportation for a new territory that has not adequate street car facilities. A 10-cent fare will be charged with transfers to connecting street car lines. S. W. Greenland, representing the reorganization committee of the United Railways, presented to the board a petition signed by 900 residents of the district asking for the service. About fifty home owners were on hand to support the application.

Bus Expansion by East St. Louis Line.—The Red Line Motor Bus Company, an auxiliary of the East St. Louis & Suburban Railway, is now operating two buses each way daily between Greenville, Ill., and St. Louis, Mo., via the Eads Bridge. In addition, two other buses will run from Greenville to Collinsville each way, making connection with the suburban street cars in Collinsville.

Cross-town Line in Fond Du Lac.—Permission to operate a cross-town bus line, has been sought of the City Commission of Fond Du Lac, Wis., by the Wisconsin Power & Light Company. This proposed city bus system would work in harmony with the company's railway with interchangeable transfers. If operating conditions justify the service will be extended to other parts of the city which do not now enjoy transportation service. To obtain the sentiment of residents living in the districts on routes and schedules the company is conducting a city-wide house-to-house survey. Equipment which the company proposes to use would comprise buses of the street car type.

New Service Started. — The Los Angeles Motor Bus Company, a subsidiary of the Pacific Electric Railway and the Los Angeles Railway, started the operation of buses on Riverside Drive, Los Angeles, Cal., on Feb. 1. The line extends from Dayton Avenue and San Fernando Boulevard along Riverside Drive to Whitmore Avenue and Alessandro Street. A connection will be made with certain Los Angeles Railway and Pacific Electric cars. The line will skirt the bottom of the Elysian Park Hill. The fare is 10 cents with transfer privilege to and from the railway cars.

International Application Held Up.—Plans of the International Bus Corporation, a subsidiary of the International Railway, Buffalo, to start a bus line in Richmond Avenue on a similar basis as the other three local bus lines are being held up. The delay is due to the hearing by the Public Service Commission on the application of Ernest M. Howe, Detroit, for permission to operate thirteen bus lines over 71.5 miles of streets at a 5-cent fare under the franchise obtained from the City Council last fall. The International also plans the extension of its Delaware Avenue bus line from the Buffalo-Kenmore city line to the north village line of Kenmore at an additional 5-cent fare or the sale of round-trip tickets for 25 cents. The fare inside the city is now 10 cents.

Opposes Bus Routes.—The Hartford & Springfield Street Railway, through Harrison B. Freeman, receiver, appeared recently in opposition to the petitions of the New England Transportation Company to operate bus routes between Hartford and Broad Brook, Conn., and between Hartford and Suffield, Conn. The New England Transportation Company, however, was authorized to operate and started its service on Jan. 17. Mr. Freeman declared the lines might prove an entering wedge toward direct competition for his company.

Bus Stock Increased. — The Public Service Transportation Company, a bus subsidiary of the Public Service Railway, Newark, N. J., filed an amendment to its certificate of incorporation with the Secretary of State on Jan. 28 increasing its authorized capital stock from 1,000,000 to 1,500,000 shares of no par value. The increase was authorized at a directors' meeting Jan. 12 and ratified at a subsequent stockholders' meeting.

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Financial and Corporate

Reappraisal Suit at Rochester to Be Heard in March

Trial of the reappraisal suit brought by the city of Rochester, N. Y., to determine the valuation of the Rochester lines of the New York State Railways is scheduled for the equity term of Supreme Court, Justice Stephens presiding, on March 3.

Clarence M. Platt, corporation counsel for the city, and the law firm of Harris, Beach, Harris & Matson, for the railways, already are marshaling their arguments in this long-standing legal controversy.

The Common Council rejected the compromise offer of the traction company to lop off $1,400,000 from the base valuation of $19,216,000 as originally fixed in the service-at-cost contract under which the railway operates in the city.

The city's position is that war time prices prevailed in the appraisal and that the valuation as fixed then is excessive. The decision of the Appellate Division, Third Department, in the certiorari proceeding to review the rates charged by the Peoples Gas Company of Oswego is being studied as bearing on the Rochester case.

In this decision the court held that the Public Service Commission was in error in not allowing value as a going enterprise and in not considering the good will of the properties. These points were not considered in the Rochester appraisal.

James F. Hamilton, president of the New York State Railways, contends that the proceeding will result in establishing a higher valuation for the Rochester properties. He declared that the company's offer of settlement was solely to avoid litigation costly to all parties concerned.

Mr. Fitkin Comments on Newport News Purchase

According to A. E. Fitkin, president of the National Public Service Corporation, 80 per cent of the preferred and common stocks of the Newport News & Hampton Railway, Gas & Electric Company has been acquired. The price paid for these stocks is understood to have been $110 a share. As indicated previously in the ELECTRIC RAILWAY JOURNAL the properties just taken over will be combined with the Virginia-Western Power Company, Virginia-Northern Power Company and other Virginia holdings of the Fitkin interests in a Virginia operating company which will be a subsidiary of the National Public Service Corporation.

Acquisition of the Newport News & Hampton Railway, Gas & Electric Company will add more than $2,000,000 to yearly gross revenues of the National Public Service Corporation. The Newport News company serves without competition a population of about 60,000 over a territory of 14 miles, extending from Old Point Comfort on the eastern end of the peninsula through the towns of Phoebus and Hampton to Newport News. The territory is almost entirely industrial, the largest single industry being the Newport News Shipbuilding & Dry Dock Company.

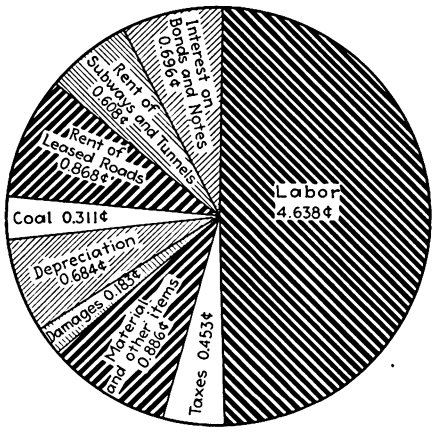
In commenting on this purchase, Mr. Fitkin said:

> Our engineers consider the Newport News & Hampton Railway, Gas & Electric Company one of the finest properties from the standpoint of physical efficiency they have examined in a long while, and we believe the territory served has recovered from the after effects of the war and is launched upon a great era of expansion and prosperity. The property has been ably managed, public relations are excellent and the company will form an important link in our Virginia operations. The company will be under management of the General Engineering & Management Corporation.

$502,195 Net for Boston Elevated

Seventh Annual Report of Public Trustees Makes a Remarkable Showing —Bus Business Growing—Statistics of Operation Deserve Careful Study—Gratifying Increase in Riding

THE Boston Elevated Railway, Boston, Mass., which is operated by public trustees, has just presented its annual report to the Massachusetts Legislature. The period covered is the year 1925. The trustees show $502,195 as the balance of receipts above cost of service. In 1924 there was a deficit of $636,696. The total receipts for the year were $34,547,379. This is the largest amount during the five years that are compared in the report. The operating expenses, such as wages, material, damages, depreciation and fuel, were $24,405,735. Added to this were



Average Receipts per Revenue Passenger, 9.464 Cents. Cost of Service, 9.327 Cents per Revenue Passenger

taxes, rents, interest and miscellaneous items to the amount of $34,045,185. The number of revenue passengers carried in 1925 was 365,036,286, a reduction of 17,852,562 from last year.

The report shows that of the loan assessment of 1919 it paid back to the contributing cities and towns only $20,581 last year, as against $1,114,557 in 1924. On this loan the sum of $2,327,816 is due to the cities and towns of Boston, Cambridge, Somerville, Brookline, Medford, Malden, Everett, Watertown, Arlington, Chelsea, Newton and Belmont. In the reserve fund there is $637,797, compared with $176,868 one year ago.

Close supervision of expenditures was necessary to reach this result. Basic wage rates of 72½ cents an hour for surface motormen and conductors, established by the 1924 arbitration award, were continued unchanged by the arbitration board of 1925, but the board increased the differential for one-man car and bus operators from 8 cents to 10 cents an hour above the basic rate.

In order to meet the situation created by the 1924 award the repair shops were operated throughout the greater part of the year on a five-day week, track reconstruction was reduced somewhat below the average amount necessary, car mileage operated was reduced 500,000, one-man car operation was considerably increased and many lesser economies were put into effect.

Reduction in cost of power and cost of accidents, together with an increase of $386,716 in operating revenues, materially assisted in reaching the favorable result shown.

The increase in bus transportation is shown by the following table of miles operated:

1922	63,937
1923	465,382
1924	890,901
1925	2,472,456

At the present time there are 25 routes in operation employing 157 buses. In connection with this business the chartering of special buses in place of special cars and supplementary to special car service is being developed. Last year the revenue from this special bus service was $15,130.

On the subject of buses the trustees say in part:

"It was early decided that the public would best be served by seeking to discover where bus service would be desirable and then supplying it in conjunction with rapid transit and surface electric lines. In large metropolitan centers better and more economical transportation can in general be supplied by electric cars, but upon lines where traffic is not sufficient to warrant the heavy investment in track and electric system or where streets are so narrow or congested by vehicular traffic that the electric car is continuously blocked and delayed in its passage the bus fills an important place.

"If competing bus lines were established within the area served by the railway system operated by this board in behalf of the commonwealth the revenue of passengers so diverted would constitute a direct loss to the

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COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES OF THE BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31

	1925	1924	1923	1922	1921
Total receipts	$34,547,379	$34,175,319	$34,096,813	$32,699,176	$33,277,025
Operating expenses:					
Wages	16,931,549	17,358,670	16,224,275	14,772,340	15,563,255
Material and other items	3,175,981	3,203,378	3,236,805	2,903,650	3,093,934
Injuries and damages	666,488	740,025	822,775	555,355	518,249
Depreciation	2,496,000	2,496,000	2,004,000	2,004,000	2,004,000
Fuel	1,135,715	1,424,058	1,842,396	1,853,111	1,663,617
Total operating expenses	$24,405,735	$25,222,133	$24,130,253	$22,088,458	$22,843,056
Taxes	1,652,517	1,623,995	1,688,139	1,587,186	1,546,758
Rent of leased roads (including dividend rental under chapter 159, Acts of 1918)	3,169,448	3,175,566	3,185,577	3,646,595	4,203,061
Subway and tunnel rents	2,217,470	2,125,593	2,026,936	2,008,414	1,963,737
Interest on bonds and notes	2,540,909	2,602,891	2,316,026	1,891,315	1,494,258
Miscellaneous items	59,104	61,835	70,247	65,016	54,707
Total cost of service	$34,045,185	$34,812,016	$33,417,181	$31,286,987	$32,105,580
Loss for year	.....	$636,696	.....	.....	.....
Gain for year	$502,193	.....	$679,631	$1,412,189	$1,171,444

Profit and loss items not included in above.

commonwealth, to which accrues all receipts after payment of expenses. In addition to that loss the service furnished to the public would be impaired. Consequently, this board has consistently taken the position that no competing bus lines should be permitted within the territory served by this system and has adopted the policy of standing ready to furnish bus service within that general territory wherever it appeared in the public interest that bus service should be given. By this method better transportation is supplied, since with street cars and buses under one management the service given by each can be co-ordinated and used to improve instead of to injure the service given by the other. Free transfer from car to bus and vice versa is possible under such a unified system."

During the year new garages accommodating 56 buses each were constructed at the Arborway near Forest Hills and on Salem Street, Medford, and the first unit of the Lotus Place car repair house has been practically completed.

A prepayment station has been constructed at Egleston Square and an area provided at Kendall Square for interchange between Cambridge subway trains and buses operating from this point.

During the year actual construction of the Dorchester tunnel extension was begun by the Transit Department of the city of Boston. The first section of the work has been completed and substantial progress made upon the second section.

More than 13 miles of track and special work have been rebuilt and 2.31 miles extensively repaired.

All-night service of cars in the Boylston Street subway has been started and a system of stopping cars at particular berths has been put into effect in subway stations.

In order to encourage parking of automobiles outside of the congested centers and inducing such riders to make their journey into the city by rapid transit, land located near the Everett Terminal was leased for storage purposes. Direct connection of a large garage adjacent to this land with the Kendall Square station of the Cambridge subway awaits action by the Legislature authorizing the Department of Public Utilities to act for the commonwealth in giving necessary permission.

On the subject of rolling stock the trustees say:

"It is interesting to note that of the 82,450 cars in the United States 34 per cent are more than twenty years of age, while on the Boston Elevated only 12.7 per cent of the passenger cars now in service are more than twenty years old."

Sixty cars of the Cambridge subway type have been ordered to provide for operating the Dorchester Rapid Transit extension when completed. Ninety new No. 5 type cars of an order of 100 placed in July, 1925, have been received and placed in service.

For several years past the board in its annual reports and before committees of the General Court has called attention to existing limitations upon the raising of new capital for essential improvements of the railway. The board still believes the General Court should provide means for raising new

ALLOCATION OF ASSESSMENT ON CITIES AND TOWNS OF BOSTON ELEVATED DEFICIT YEAR ENDED JUNE 30, 1919

History of the 1919 Loan Assessment on Cities and Towns (Chapter 159, Special Acts 1918)

Cities and Towns	Passengers	Per Cent	Amount	Distribution of July, 1922, Repayment	Distribution of July, 1923, Repayment	Distribution of July, 1925, Repayment	Balance Due
Boston	2,100,423	71.9330	$2,863,042	$372,034	$790,029	$14,902	$1,686,075
Cambridge	283,475	9.7081	386,397	50,209	106,622	2,011	227,553
Somerville	122,583	4.1981	167,090	21,712	46,106	869	98,402
Brookline	74,553	2.5532	101,621	13,205	28,040	528	59,846
Medford	59,754	2.0464	81,449	10,583	22,475	423	47,966
Malden	55,838	1.9123	76,112	9,890	21,002	396	44,823
Everett	54,823	1.8775	74,727	9,710	20,619	388	44,008
Watertown	41,198	1.4109	56,155	7,297	15,496	292	33,070
Arlington	32,477	1.1122	44,267	5,752	12,215	230	26,069
Chelsea	29,659	1.0157	40,426	5,253	11,154	210	23,807
Newton	27,201	0.9316	37,079	4,818	10,231	193	21,836
Belmont	18,746	0.6420	25,552	3,320	7,051	133	15,047
Quincy (Comm. of Mass.)	15,569	0.5332	21,222	2,757	18,464	.....	.....
Stoneham (Comm. of Mass.)	3,674	0.1258	5,007	650	4,356	.....	.....
*Commonwealth of Mass.	.....	.....	.....	.....	690	.....	†690
Totals	2,919,973	100.00	$3,980,151	$517,196	$1,114,557	$20,581	$2,327,816

Based on traffic counts made July 24, 25, 26, 27, 1919, in accordance with the provisions of Section 14, Chapter 159, Special Acts 1918.

* From the July, 1923, repayment, the commonwealth of Massachusetts deducted $690.24 to reimburse itself for the difference between 126 days interest at 4.28 per cent on $4,000,000 (Note issued July 17, 1919, due Nov. 20, 1919) and $3,980,151.67, the amount paid to the B. E. Ry. Co. $297

And interest from July 17, 1919, to July 19, 1923, on amount the state deducted to pay assessment of Quincy and Stoneham 392

Amount of expense to state to be assessed to towns and cities pro rata to their original contribution $690

† Credit.

STATEMENT OF REVENUE PASSENGERS CARRIED BY BOSTON ELEVATED RAILWAY

	5c. Fares	6c. Fares	7c. Fares	8c. Fares	10c. Fares	Pupils' Tickets 5c.	Special Car and Special Bus Passengers (*See Note*)	Total Revenue Passengers	Present Yearly Increase
1917—Year ending Dec. 31	380,819,242	.....	.....	.....	.....	.....	198,096	381,017,338	1.99
1918—Year ending Dec. 31	217,203,899	.....	102,619,954	28,739,858	.....	.....	100,989	348,664,700	*8.49*
1919—Year ending Dec. 31	886,034	.....	.....	173,808,769	146,162,131	3,803,815	97,936	324,758,685	*6.86*
1920—Year ending Dec. 31	*3,846,989	.....	.....	.....	326,496,184	5,105,588	77,800	335,526,561	3.32
1921—Year ending Dec. 31	23,915,742	.....	.....	.....	307,624,243	5,606,105	105,990	337,252,080	0.51
1922—Year ending Dec. 31	71,425,347	.....	.....	.....	279,851,313	5,213,664	103,618	356,593,942	5.73
1923—Year ending Dec. 31	94,170,518	.....	.....	.....	283,660,762	4,214,132	104,285	382,149,697	7.17
1924—Year ending Dec. 31	85,218,867	9,549,775	.....	.....	283,569,003	4,443,228	107,975	382,888,848	0.19
1925—Year ending Dec. 31	3,853,807	55,937,785	.....	.....	299,107,782	6,003,917	132,995	365,036,286	*4.66**

5-cent fare previous to Aug. 1, 1918.
7-cent fare Aug. 1, 1918.
8-cent fare Dec. 1, 1918.
Pupils' tickets (5-cent) Jan. 1, 1919.
10-cent fare July 10, 1919.

First 5-cent fare line (without transfer) Aug. 23, 1919.
First 5-cent local fare line March 26, 1921.
5-cent fare for children under fourteen years (not including children under five years) June 14, 1922—discontinued Nov. 5, 1924.
6-cent local fare Nov. 5, 1924.

Note—Previous to 1908 special car passengers included with 5-cent fares.

*During the years 1922, 1923 and 1924, one passenger making a single journey for which he might pay two 5-cent fares was counted as two revenue passengers. The substitution in November, 1924, of 6-cent tickets for 5-cent cash fares has often resulted in the payment of a 10-cent fare by such a passenger with a consequent reduction in the company's figures of total revenue passengers carried, though the gross passenger revenue for the year 1925, which increased $371,269, would indicate substantially the same number of passengers carried by the railway in 1925 and 1924.

Italics denote decreases.

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capital. That matter has been recently considered by a special recess commission in a report now before the state law-making body. The trustees say that pending consideration of that report by the court the board feels that it should confine itself to operating the railway at the highest efficiency possible with existing facilities and such property as can be purchased from time to time from the allowance to offset the annual exhaustion of the depreciable property.

The average pounds of coal consumed per kilowatt-hour direct-current at the cars was 1,973 in 1925 compared with 2,068 last year. This is the lowest of any year in the history of the railway. The average cost of coal per ton during 1925 was $5.22, compared with $5.921 last year, and is also the lowest since 1917. There was a reduction of 23,078 tons of coal burned as compared with 1924.

An improvement has been made during this year in the accident record. Operating charges on this account were reduced from $914,043 in 1924 to $846,235 in 1925.

The seventh full year of public operation closed on June 30, 1925, with a balance of receipts over cost of service of $20,581. This amount was repaid to the cities and towns served by the railway.

A gratifying increase in riding and revenue during the latter part of 1925 and early 1926 has permitted the resumption of full time work in the shops and a substantial increase in the number of car-trips and car-miles operated.

ACCIDENTS PER MILLION CAR-MILES

	1925	1924
One-man cars	204	205
Two-man cars	245	249

STATEMENT OF RESERVE FUND OF BOSTON ELEVATED RAILWAY ON DEC. 31, 1925

Balance Jan. 1, 1925		$176,868
Excess of receipts over cost of service:		
January	$269,649	
February	118,183	
March	211,955	
April	130,636	
May	139,081	
October	117,703	
November	45,265	
December	289,343	
	$1,321,820	
Excess of cost of service over receipts:		
June	$25,792	
July	249,477	
August	367,593	
September	176,763	
	$819,628	
Excess for the year of receipts over cost of service		502,191
		$679,060
Amount refunded to commonwealth of Massachusetts, July 1, 1925		20,581
		$658,478
Profit and loss items, Dr		20,680
Balance—Dec. 31, 1925		$637,797

STATEMENT OF SPECIAL TRUST FUND OF BOSTON ELEVATED RAILWAY, DEC. 31, 1925

Principal of trust fund as established			$1,500,000
Accretions and accumulations to Dec. 31, 1925			633,495
Total special trust fund			$2,133,495
Income from June 10, 1922, to Dec. 31, 1925		$330,694	
Less amount paid on account of retirement of second preferred stock, as follows:			
718½ shares purchased July, 1923	$72,193		
919 shares purchased July, 1924	90,319		
1,116 shares purchased July, 1925	111,685	$274,198	
			56,496
Investments			2,126,840
Cash on deposit			$63,151

TRAFFIC STATISTICS OF BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31

	1925	1924	1923	1922
Round trips operated	7,185,587	6,994,749	6,488,082	6,059,531
Passenger revenue	$33,790,441	$33,419,172	$33,297,951	$31,834,022
Passenger revenue per car-mile (cents)	60.93	59.69	61.61	62.94
Passenger revenue per car-hour	$5.86	$5.67	*$5.71	$7.09
Passenger revenue mileage	†55,461,094	†55,988,679	†54,049,665	†50,575,088
Passenger revenue car-hours	5,767,957	5,894,115	*5,826,993	4,487,400
Revenue passengers carried	365,036,286	382,888,848	382,149,697	356,593,942
Revenue passengers carried per car-mile	6.582	6.838	7.070	7.051
Revenue passengers carried per car-hour	63.28	64.96	*65.58	79.47

*Car-hours, American Electric Railway Association Standard, adopted Feb. 1, 1923.
†Including motor bus mileage....1922, 63,937 1923, 465,382 1924, 890,901 1925, 2,472,456

COMPARATIVE POWER STATION STATISTICS OF THE BOSTON ELEVATED RAILWAY

	1925	1924	1923	1922	1921	1920	1919
Tons of coal burned	217,414	240,493	260,032	273,441	215,870	258,087	287,670
Pounds of coal per kilowatt-hour	1.973	2.068	2.264	2.553	2.174	2.353	2.835
Average price of coal per ton	$5.22	$5.921	$7.085	$6.777	$7.71	$10.07	$5.91
Net cost of power for car service per kilowatt-hour (cents)	1.021	1.093	1.227	1.414	1.172	1.921	1.307
Net cost of power per total revenue car-mile (cents)	4.428	4.833	5.468	6.153	4.815	8.538	5.439
Direct current annual output (kw.)	246,835,300	260,401,225	257,270,357	239,905,874	222,461,060	245,676,503	239,892,118
Direct current maximum hour output (kw.)	85,660	86,245	82,965	78,755	75,905	72,295	71,760

COMPARATIVE PASSENGER STATISTICS OF BOSTON ELEVATED RAILWAY—REVENUE PASSENGERS CARRIED

Year	Week Day Average	Saturday Average	Sunday Average	Holiday Average	Total for Year
1925	1,066,317	1,172,871	577,200	650,007	*365,036,286
1924	1,109,861	1,216,132	630,755	727,191	*382,888,848
1923	1,109,274	1,196,301	652,404	758,915	*382,149,597
1922	1,030,303	1,144,320	617,148	691,890	*356,593,942
1921	975,745	1,060,295	578,860	696,691	337,252,080
1920	960,737	1,072,319	591,063	703,634	335,526,561
1919	934,916	1,078,635	596,182	706,429	324,758,685
1918	985,384	1,147,809	638,902	775,634	348,664,700
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1915	992,283	1,140,046	685,726	846,860	352,469,586

*Note—During the years 1922, 1923 and 1924 one passenger making a single journey for which he might pay two 5-cent fares was counted as two revenue passengers. The substitution in November, 1924, of 6-cent tickets for 5-cent cash fares has often resulted in the payment of a 10-cent fare by such a passenger, with a consequent reduction in the company's figures of total revenue passengers carried, though the gross passenger revenue for the year 1925, which increased $371,269.51, would indicate substantially the same number of passengers carried in 1925 and 1924.

Net Earnings at Springfield Improve

The Springfield Street Railway, Springfield, Mass., has announced a 5 per cent dividend on 1925 business, compared with a 2 per cent dividend for 1924. Net income for 1925 was $239,135, compared with $133,846 in 1924, a gain of $105,289. There was a loss of more than 4,000,000 revenue passengers for the year. An increase of fares to the 10-cent basis and the extension of the use of the one-man cars account for the improved showing in net income.

Bus operations of the company showed a 50 per cent increase of mileage in 1925. Two new suburban lines were added and the number of buses increased to 25. Passengers carried by bus totaled 1,356,316, out of a grand total of 39,602,870. Total passenger revenue for the year increased $55,040 over the previous year. Comparative statistics for the two years follow:

STATEMENT OF EARNINGS OF SPRINGFIELD STREET RAILWAY

	1924	1925
Gross revenue	$3,173,616	$3,228,746
Operating expenses	2,760,564	2,697,362
Taxes, rentals, interest and other fixed charges	279,205	292,247
Net income	133,846	239,135
Dividends	*93,094	†232,735
Surplus	40,752	6,400

* 1924, 2 per cent. † 1925, 5 per cent.

Income Higher in 1925 Period.—The gross income for the last six months of 1925 for the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was $22,463,954, against $21,448,951, in 1924. The net income after charges was $2,994,524, against $2,598,524 for the six months period ended December, 1924.

More Passengers in St. Louis.—Operating on the average 33 cars a day fewer during the last quarter of 1925 than were used in the corresponding period of 1924, the United Railways, St. Louis, Mo., carried 654,429 more passengers. A total of 66,998,669 revenue passengers was carried against 66,344,240 from October through December of 1924. The cars of the company made a total of 1,459,036 trips, or 41,018 fewer than in the last quarter of 1924. Miles traveled by the cars the last quarter totaled 9,501,723, against 9,789,677 in a similar period of 1924. The quarter ended Dec. 31, 1925, showed an increase of 4,246,379 passengers compared with the quarter ended Sept. 30, 1925.

Purchase Rumors at Portland Denied.—Persistent reports that the American Power & Light Company interests had opened negotiations for purchase of the control of the Portland Electric Power Company, Portland, Ore., have been denied by Franklin T. Griffith, president of the company.

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New Director Elected.—Ed Crawford has been added to the board of directors of the Shreveport Railways, Shreveport, La.

Small Balance for Transportation Area.—The Athol & Orange Transportation Area for 1925 reports passenger revenue of $41,908 and total revenue of $43,392. Expenditures were $41,768, leaving a balance of $1,624. Only $31 was paid out for damage claims during the year. The present system of operation under special permissive legislation from the State of Massachusetts has been in force 21 months.

Bond Issue Authorized.—The Key System Transit Company, Oakland, Cal., has been authorized by the Railroad Commission to issue and sell $2,500,000 of series "C" first mortgage 5½ per cent bonds, due July 1, 1938, at not less than 94 per cent of face value, plus accrued interest. The proceeds are to be used to pay indebtedness, reimburse its treasury and for additions and betterments.

Book Reviews

Proceedings of Fifteenth Annual Convention, Pacific Claim Agents Association

This 32-page pamphlet contains the papers and a brief reference to discussions at the annual meeting of the association, held at Los Angeles July 22-24, 1925. The report of this convention was published in the issue of ELECTRIC RAILWAY JOURNAL for Aug. 8, 1925.

Second Technical Conference of the State Utility Commission Engineers

Published by the Department of Commerce, Bureau of Standards. 98 pages.

This is a report of the meeting held March 6, 1924, at the Bureau of Standards, Washington. Discussion of the subject of utility valuations and rates occupied the first day. The second day the discussion was more diversified. Perhaps the principal topic, however, was rural extensions and rural electric service.

Labor Laws of the United States

The Bureau of Labor Statistics of the United States Department of Labor has been obliged again to revise its publication of labor legislation of the United States, being the sixth compilation of this character published by this office. By summarization and abridgment, the contents of the two volumes of Bulletin 148, published in 1914, and nine succeeding annual bulletins, including also the legislation of the years 1923 and 1924, have been condensed into a single volume (Bulletin No. 370). The result is a volume of convenient size containing the substance, and in many instances the full text, of all existing labor legislation except that relating to workmen's compensation, which is incorporated in a separate series of bulletins.

Few new subjects appear, the current tendency in labor legislation being rather to elaborate the laws regarding safety, sanitation, wage payments, the right of contract, the employment of women and children, etc., than to undertake any new departures. Administrative provisions have received attention by legislatures, and the concentration of law enforcement into the hands of a single agency is a tendency that is apparent. The court decisions have been expanded in some measure, and some classes of laws have received sufficient discussion to indicate the status of the type of legislation under consideration. Thus, in the matter of state laws affecting interstate commerce by railroad, the power of Congress is shown to be exclusive where it has entered the field. Opinion seems to be divided as to the right of municipalities to engage in the ice business, the operation of fuel yards, etc., but the courts are practically of one mind as to laws forbidding the discharge of union workers on account of organization membership.

The volume affords the answer to many questions submitted almost daily to the bureau. It is an essential handbook to any one interested in industrial and economic law.

Planning Problems of Town, City and Region

Published for the International City and Regional Planning Conference by the Norman Remington Company, Baltimore, Md. 530 pages. Illustrated.

These are the proceedings of the conference held in New York, April 20 to 25, under the auspices of the International Federation of Town and Country Planning and Garden Cities and the National Conference on City Planning, reported briefly in the issue of this paper for April 25. City planning engineers and street railway engineers are realizing more than ever before that their problems are largely identical, and this view was emphasized in a number of the papers presented at the meeting in New York last April. It was also expressed in the resolutions adopted at the traffic and transportation round table of the conference which declared that the problem of traffic congestion and the development of adequate transportation must include all transportation agencies and that every city should adopt a traffic policy to encourage greater efficiency and organization in traffic and transportation.

A Century of Progress

Published by the Delaware & Hudson Railroad for private circulation. 755 pages. Illustrated.

In April, 1923, celebrations were held in New York City and in Scranton, Pa., of the 100th anniversary of the founding of the Delaware & Hudson Company. It was indeed an important historic occasion, for in this country corporations which have had a continuous existence of a century are very rare. Originally, the Delaware & Hudson Company was organized to mine anthracite and transport it to the city of New York and elsewhere in the state of New York. The coal was carried first by canal and afterward by railroad. The volume under review is an account of the activities of this historic company, which, in later years, has added a number of electric railways in the eastern part of New York State to its transportation system. A very interesting chapter in the book is that describing the results of federal control of the railroad during the years from 1918 to 1920. Those who advocate government operation of railroads can well obtain an object lesson of its results from the information given in this chapter.

Underground General Associated Tramways American Tour, 1924

This is a 46-page illustrated pamphlet containing papers read at a meeting of the directors, officers and assistants of the Underground General Associated Tramways on March 2, 1925, at Hotel Victoria, Northumberland Avenue, London, England. The book is for private circulation only.

They gave up "larffing" and the world "laffed" with them on that American Tour in 1924. So it would appear from reading the papers of Clive Leese, H. S. F. Lansdown of the London General Omnibus Company and H. C. Davy and A. W. Green of the Underground, who were chosen to take the trip to America in 1924 in search of knowledge and experience. Here is a diary replete with interesting experiences that these British railway magnates had on this side of the Atlantic. The illustrations alone throw special light on what the tourists were anxious to find out and also what made a big impression on them. Mr. Leese's paper stressed the types of buses in America with the problems of the American bus designers and operators. Mr. Lansdown gave a résumé of traffic conditions in America generally. In addition he discussed labor conditions in America. Mr. Davy referred to banking of traffic receipts and wages and Mr. Green made a comparative study of the country and its people and discussed control of receipts and expenditures on the railways. He prophesied future development of transport industry with America tackling the bus question. On this point he said: "We are preeminent in the motor bus world today, but if we are going to retain that preeminence it seems to me that we shall have to fight very hard."

An interesting feature of the pamphlet is a double-page spread showing in statistical form a comparative study of the London General Omnibus Company, the United Railways of St. Louis, Fifth Avenue Coach Company, the Chicago Motor Bus Company, the Connecticut Company and the Cleveland Railway. The questions answered in the table are on hours of duty, meal reliefs, guarantee, rates of pay, reporting allowance, traveling allowance, rest days and other points that are applicable to bus operation.

The tourists referred to the meeting of the American Electric Railway Association at Atlantic City and all joined in thanking the chairman and directors for the opportunity which was afforded them of visiting America.

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Personal Items

J. N. Shannahan Still in the Industry

Sale of Property at Hampton Not to Change His Railway Status—Laudatory Newspaper Comment

Plans of John N. Shannahan for the future are somewhat uncertain, but his talents will not be lost to the industry. It will be recalled that the former president of the American Electric Railway Association and head of the Newport News & Hampton Railway, Gas & Electric Company recently concluded a deal in which control of that property passed to the Fitkin interests. In the industry interest naturally centered in the question: "What is Jack Shannahan going to do?" So far as he has made any plans it is known that Mr. Shannahan will spend the next few months and possibly longer in developing large real estate holdings of the Old Dominion Land Company in and about Newport News which he purchased recently from Henry E. Huntington. He expects to remain head of Peck - Shannahan - Cherry, Inc., which firm has long operated a number of electric railways, several of which center at Syracuse, N. Y.

Jack Shannahan's record is too well known to those in the industry to need reiteration. He represents the best there is and practices what he preaches. No amount of mere biographical facts, however complete in themselves, written from within the industry would tell half so well the story of his achievements as an operating official as do the expressions of appreciation contained in the local papers at Hampton. Daily newspapers are not given to saying nice things about men and their work, particularly public utility men, unless the men and the work they do deserve it. They have other fish to fry. Most of them would rather use vitriol than varnish.

It is no more possible to cite all the expressions of appreciation by his handling of the properties than it would be to quote from them at length. Extracts from two editorials, each nearly a column in length, suffice to indicate the tenor of the comments and emphasize the fact that the value of good public relations is a real, tangible thing. The Newport News *Times-Herald* said:

The Newport News & Hampton Railway, Gas & Electric Company has sold not only a valuable property but a good name. By square dealing, honest and efficient service, respect for the rights of the public and by identifying itself with the interests of the community it served, the company has gained the respect, the confidence and the good will of the people of the Lower Peninsula, which is a most valuable asset. The company has never attempted to dicker with the municipal bodies of this section. To the contrary, it has treated those bodies with consideration, has kept no secrets from them, has laid its case in frankness and confidence before them whenever any emergency in its affairs has arisen and has consulted them before applying to the State Corporation Commission for any increase in rates; and has never gone before the commission with such a petition without having first gained the consent and cooperation of the municipal bodies concerned. In short, the company has made itself part and parcel of the community and has heartily co-operated with the people in all movements and enterprises for the common good. It has been a good and helpful partner and has rendered service in many directions, outside of its immediate sphere of activities. The company also has been considerate of its employees, and has gained their good will, as well as that of its patrons and the general public.

We should be less than frank did we not say that the retirement of President Shannahan from the company is a matter of regret to the community. He has the full confidence and the friendly regard of this people. He has proved himself to be not only an able and honest operator of the public utilities, but a loyal, progressive, public-spirited and very valuable citizen, and his administration has given the people a sense of security. But this regret is largely alleviated by the fact that Mr. Shannahan will continue to reside here, and that he will devote his abilities and activities to the development of the Old Dominion Land Company. The *Times-Herald* is well pleased to learn that.

J. N. Shannahan

The Newport News *Press* said:

The company has given an efficient service and has dealt honestly and considerately with the entire community; with its employees as well as with its patrons, and it has gained the good will of all.

It is not in disparagement of the other officers to say that this is due, primarily, to the integrity and the fidelity of President Shannahan. He is an upright man and he is a loyal citizen. He has dealt with the community not in selfishness, but in the spirit of fairness and generosity. He has contributed liberally of his private means and the means of his company toward all public enterprises, and he has made the public utilities a strong agency in community progress. His indorsement of any enterprise is sufficient to inspire the confidence of investors. It is with keen regret, therefore, that the people see Mr. Shannahan retire from the presidency of the company, but it is gratifying to know that the sale of his holdings in the company does not involve his removal to another place of residence.

The manager of Fitkin Utilities, Inc., informs the *Daily Press* that for the present, at least, there will be no change of policy or in the personnel of the local management. That is a pleasing announcement, and the *Daily Press* hopes that the status quo may continue indefinitely. We are a very neighborly people, gentlemen, and we have a friendly spirit. We are also hospitable and kindly disposed to all genteel persons who may cast their lot with us. We are prepared to give you a warm Virginia welcome, and you may count upon fair treatment from the authorities and from the general public, and also upon our friendly co-operation, so long as you deal with us in the same spirit that characterized the old company.

Certainly there is comment indicating in no unmistakable terms that the praise bestowed upon Mr. Shannahan was well deserved!

Personnel Changes in Cincinnati

F. J. Venning, superintendent of shops, equipment and overhead of the Cincinnati Street Railway, Cincinnati, Ohio, has been appointed superintendent of power. His former assistant, E. J. Jones, has been named superintendent of equipment.

Mr. Venning will have charge of the operation and maintenance of the power houses, substations, overhead transmission and distribution system and inclined planes. Mr. Jones will have jurisdiction over the maintenance of cars, the operation of the Chester Park shops and all carhouses.

W. H. Lines in Charge of Railway Operations at Portland

W. H. Lines, assistant to the president of the Portland Electric Power Company, Portland, Ore., for the past year, was placed in charge of all railway departments and operations of the company on Feb. 1. He retains his former title. This new responsibility covers part of the executive duties of the late Franklin I. Fuller. President Griffith states, however, that it may be a month or more before a successor to Mr. Fuller is named.

Mr. Lines is an engineer of wide experience. He has been with the Portland Electric Power Company in various capacities for the last fourteen years.

F. W. Coen Leaves Lake Shore Electric Railway

After many years of service with the Lake Shore Electric Railway, F. W. Coen, Cleveland, resigned as vice-president and general manager, effective on Jan. 30. Under Mr. Coen's direction the property was developed into one of the largest passenger, freight and express carriers in the Central West. In addition to the transportation industry there has also been developed a large and rapidly growing light and power business. Mr. Coen has been active in the affairs of the American Electric Railway Association and of the Central Electric Railway Association, of which he is a past-president.

He has not decided whether he will again engage in the electric utility field or become identified with industry in some other line.

P. H. Gadsden Heads Philadelphia Chamber of Commerce

Philip H. Gadsden, vice-presiden; United Gas Improvement Company and former president American Electric Railway Association, is the new president of the Philadelphia Chamber of Commerce. In his initial address to the members of that organization Mr Gadsden expressed the hope that it might be possible during the coming

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year to bring about "closer co-operation among all the commercial and business organizations of Philadelphia." As the Philadelphia *Ledger* sees it, unity of effort among the city's business organizations is the goal worth striving for. The *Ledger* says: "If it can be attained under the inspiration and tactful generalship of Mr. Gadsden, he will have performed a public service of inestimable value."

C. L. Bartlett Massachusetts Northeastern Manager

Clifton Lewis Bartlett has been appointed general manager of the Massachusetts Northeastern Street Railway, with headquarters at Haverhill. He succeeds the late Ralph D. Hood. Mr. Bartlett was born in Haverhill in 1890. He entered the employ of the Haverhill & Southern New Hampshire Street Railway, the Northeastern company's predecessor road, in 1907 as a checker of conductors' returns. In 1925 he was made chief clerk and claim agent. He has been acting as general manager since Dec. 30.

S. L. Nicholson Made Westinghouse Vice-President

At a recent meeting of the executive committee of the Westinghouse Electric & Manufacturing Company S. L. Nicholson was elected acting vice-president. This honor follows an association of more than 27 years with the Westinghouse company and is in recognition of the noteworthy services which Mr. Nicholson has rendered to the electrical industry. He became sales manager of the Westinghouse company in 1909 and held that position until 1917, when he was made assistant to the vice-president.

Mr. Nicholson assisted in the formation of the American Association of Electrical Motor Manufacturers, which is now known as the Electric Power Club, and was its first president. He also assisted in the formation of the American Gear Manufacturers Association and the Stoker Manufacturers Association. He was chairman of the Electrical Manufacturers Council, which is the co-ordinating committee of the Power Club, Electric Manufacturers Club, and the Association of American Manufacturers of Electrical Supplies.

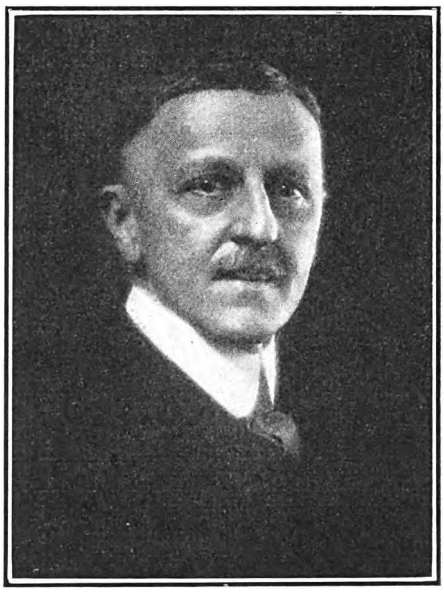
In 1921 he was chairman of the tariff committee of the council and represented the electrical industry on its National Industry Conference Board. Mr. Nicholson is also a member of the Electrical Safety Conference, the American Statistical Association, and the Bureau of Personnel Research of the Carnegie Institute of Technology. He is a native of Philadelphia and began his electrical career in 1887, serving various companies from that date until 1898, when he joined the Westinghouse company.

G. T. Lackey, vice-president and agent for the receivers of the Oklahoma Railway, Oklahoma City, Okla., has been made general superintendent of all the departments of the company, working under the direction of the two receivers. Mr. Lackey has been with the company seven years.

W. H. Woodin, Brill Chairman

Head of American Car & Foundry Now Interested in Companies Supplying All Forms of Transportation Equipment—Reared in Atmosphere of Cars and Car Construction

W. H. WOODIN, elected chairman of the board of directors of the Brill Corporation, newly organized to control the J. G. Brill Company and the American Car & Foundry Motors Company, has back of him a groundwork of experience in the railway equipment field which dates back to 1890. He was reared in an atmosphere of car design and cars. The name of Woodin has been associated with railway car building since the inception of that industry in this country. Mr. Woodin's grandfather was one of the organizers of the Jackson & Woodin Manufacturing Company, founded in 1842 and taken over by the American Car & Foundry Company at the time of its organization in 1899.



W. H. Woodin

Mr. Woodin is not only president of the American Car & Foundry Company, but last December was elected a president of the American Locomotive Company, succeeding Andrew Fletcher, deceased. Before that he had been a director and a member of the executive committee of the American Locomotive Company for many years. This affiliation is really more than that of one individual with several companies. The American Car & Foundry Company has large holdings of American Locomotive Company stock and Mr. Woodin himself is a large shareholder of the company.

The election of Mr. Woodin to the Locomotive company was in recognition of his executive ability, supplemented by his extended familiarity with the supply field in general and with the operations of the American Locomotive Company in particular. Similar considerations governed his election as chairman of the board of the new Brill corporation, control of which is lodged with the American Car & Foundry Company. Through the Brill corporation and its subsidiary, the American Car & Foundry Motors Company, the Hall-Scott Motor Car Company and the Fageol Motor Company of Ohio are owned. Thus Mr. Woodin's help and advice will be available in shaping the policies of companies supplying equipment for all forms of common carrier transportation.

The extent of the operations of these companies is shown by the fact that the American Car & Foundry Company operates four passenger car building plants, sixteen freight car building plants, six wheel foundries, eight gray iron foundries and several other plants, while the American Locomotive Company operates eight plants. The facilities of the companies just brought into the new Brill organization need no reiteration.

Director of Many Corporations

Mr. Woodin has many other business affiliations. He is chairman of the board of the Canadian Car & Foundry Company and a director of the American Exchange Security Corporation, the American Beet Sugar Company, the Westinghouse Electric & Manufacturing Company, the Montreal Locomotive Works, the Westinghouse Electric International Company, the General Motors Corporation, the Cuba Company, Cuba Railroad, the Compañia Cubana and the American Ship & Commerce Corporation. Like many other big business men, he has a hobby and rides it hard. He is a coin collector. With Edgar H. Adams he is the author of a standard book on American coins. He is a member of the American Numismatic Association and the New York Numismatic Club. During the war he served the public as fuel administrator for the State of New York.

Mr. Woodin was born in Berwick, Pa., on May 27, 1868. He received his technical education at Columbia University in the School of Mines, class of 1890. He served in the shops of the Jackson & Woodin Manufacturing Company at Berwick and in 1892 was made general superintendent of that plant. In 1895 he was elected vice-president and in 1899 president. When the company was taken over by the American Car & Foundry Company in 1899 he was made district manager of the Berwick plant. He later became assistant to the first vice-president of the new company and in 1902 was made a director and assistant to the president, with general direction of the company's affairs, under President Frederick H. Eaton. On Feb. 1, 1916, he succeeded to the presidency.

Changes at Fond du Lac

M. H. Frank, formerly manager of the railways of the Wisconsin Power & Light Company at Fond du Lac, has been promoted to general manager.

F. S. Whitely has been selected manager of the company's properties at Fond du Lac, succeeding M. H. Frank.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Large Expenditures Looked For in Ohio During 1926

Electric railways in Ohio are planning large expenditures for the purpose of bettering service during 1926. Material increases to present rolling stock are contemplated, as well as the expenditure of considerable sums for track renewals, general maintenance and improvement work on roadbeds. Figures already revealed by the budget of some of the companies total more than $6,500,000 for these types of work.

The largest figure thus far indicated is that of the Cleveland Railway, which estimates its new capital expenditure for the year as $4,500,000. Of this amount, it is estimated $2,300,000 will be spent for way and structures, $1,250,000 for modernizing existing street cars and purchasing new units, $450,000 for bus equipment and $500,000 for power. The Cincinnati Street Railway will undertake a $350,000 program in improving its bus service, including provision of structures to be used for storage and repair, and estimates the amount necessary for track reconstruction at $50,000.

Purchase of new buses, remodeling cars to the one-man type and installing new track and special work will mean an expenditure of $317,353 by the Community Traction Company, Toledo. The People's Railway, Dayton, plans to spend $181,895 for track renewals, $50,894 for new work cars, $2,525 for installment of electric switches and $2,712 for miscellaneous equipment. New interurban cars which will be ordered by the Steubenville, East Liverpool & Beaver Valley Traction Company will cost approximately $150,000.

The Cleveland Southwestern Railway & Light Company will spend $80,000. Of this amount, $30,000 will be spent in its railway department and $50,000 in its light department. The Northern Ohio Traction & Light Company will spend approximately $1,000,000 in its transportation division and $1,500,000 on its light and power department. The former total includes $350,000 for additions to the South Akron substation, $225,000 for new buses, $100,000 for a new freight house and $100,000 for new freight cars. Various sums will be spent for extending its underground system, for the purchase of new transformers and equipment and for rural line extensions and the rebuilding of lines in Akron.

Other companies expecting to make material expenditures during the current year, but which have not yet indicated how extensive these will be, are the Columbus Railway, Power & Light Company, the Lake Shore Electric Railway, the Southern Ohio Public Service Company, the Cincinnati & Dayton Traction Company, the Indiana, Columbus & Eastern Traction Company, the Pennsylvania-Ohio Electric Company and several others.

Last year electric railways in Ohio were authorized by the Ohio Public Utilities Commission to issue a total of $9,002,320 of new securities. Of this amount, $7,586,620 was authorized in bonds and $1,415,700 in common and preferred stock. Indications are that the expenditures for the present year will equal if not surpass the totals for 1925.

Manufacturers to Be Aided by Publicity Campaign

Plans are rapidly going forward in connection with the intensive publicity campaign which is contemplated by the special committee on co-operation with manufacturers of the A. E. R. A. As outlined in the issue of the JOURNAL for Feb. 6 the program, which is to impress upon the public the fact that some 500,000 workers are employed in the production of electric railway supplies in the United States, will embrace a complete layout of posters for bulletin boards, stickers for letters and packages, outdoor signs, etc. The posters, labels and stickers will be supplied by E. F. Wickwire, chairman of the committee, in any quantity desired free of charge. Outdoor signs may be obtained from George H. Tontrup.

Cost-per-Mile Basis Opposed

Manufacturers Unite Against Practice of Selling Tires to Bus Operators Under a Mileage Plan—Claim Outright Purchase Is Cheaper for Consumers

"BOTH tire manufacturers and operators of buses lose under any kind of a cost-per-mile contract per tire purchased," stated an official of one of the larger tire manufacturing companies in a recent interview with a representative of ELECTRIC RAILWAY JOURNAL. On an advancing market for crude rubber prices the operator may have a slight temporary advantage, while on a falling market the odds are all with the manufacturers. In general, the manufacturers have come to the conclusion that the purchase of tires on a mileage basis is an economic fallacy resulting in inevitable rate wars among the producers, and making it necessary for the manufacturers to establish service stations throughout the country to care for all tires sold under such an arrangement.

So much interest has been evidenced in this question by traction companies operating a co-ordinated bus and railway service that it was considered of value to obtain a general statement of the manufacturers' policies and of the conditions which have led to the adoption of those policies. Accordingly, several of the principal tire producers were questioned as to their attitude toward cost-per-mile contracts and were asked whether or not they were disposed to allow any such contracts in the future. Without an exception the answers received agreed most heartily on practically every phase of the question.

The mileage purchase plan has been tried out and has been found wanting in the estimation of the larger companies. It is true that some of the smaller producers are continuing to accept contracts on this basis. One official characterized this practice as "playing with fire." He declared that an abrupt and unexpected rise in crude rubber prices would bring many smaller companies operating on limited capital to grief with quickness and dispatch. Nor has crude rubber of late exhibited any marked tendency toward stability.

Since street cars, buses, trucks and other equipment are all purchased on an outright basis, tire manufacturers see no reason why their products should not also be considered in the same light. Of course, bus operators seized upon the cost-per-mile contract as a means of "passing the buck" on at least one item of their general maintenance work. They figured that as long as the tire manufacturers were willing to undertake the servicing of tires and to give them an attractive price for this service, there was no reason why they should not relieve themselves of this particular worry. On the other hand, the manufacturers soon discovered that selling tires is one thing and selling service quite another. Furthermore, the bus operators were not long in discovering that most exasperating delays frequently resulted under this plan, since instead of taking steps to repair a flat tire themselves they were forced to await the pleasure of the manufacturer's representative.

The most reasonable argument advanced by the tire manufacturers against the mileage purchase plan, however, was simply that the actual net cost per mile to the operator in the long run is considerably less when he buys a strictly quality tire and pays for it outright. This is demonstrated as follows: A certain company manufactures a tire the quality of which insures a life of 20,000 miles. A cost-per-mile contract would therefore be figured on this mileage. Since all of the tires not actually defective may be expected to attain this mileage, it is obvious that many of them will considerably exceed it. On the cost-per-mile basis the operating companies do not profit by this excess mileage, while on the outright purchase plan it might be said to be, in common parlance, "gravy" for them. It is thus possible for the manufacturers to demonstrate on the hard bedrock of common sense that both parties to the agreement will benefit under the outright purchase plan.

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A representative of one company states:

We believe that outright purchase is preferable because for him who takes care of his tires, extra mileage, lower tire cost and fewer interruptions are his reward. And for him who is indifferent toward his tire service, low mileage, high tire cost and frequent interruptions are the penalty. To our minds, this works out fairly for everyone and such a policy should merit favor as against the plan that works a disadvantage to one or another of the parties involved. Practically all electric railway operators are buying on an outright purchase basis and we believe that they will continue to do so. Of course, outright purchase favors the quality tires as against the others because they will prove to be more trouble free and longer lived, and tires will therefore be judged more strictly on their merits.

When the cost-per-mile plan was first adopted the manufacturers had no reliable information as to tire cost on various types of buses, mileage records for equipment operating over different types of roadway and all of the countless other factors which of necessity enter into the problem. The rates given were, therefore, absurdly low in many cases, at least one contract having been awarded on a cent-per-mile basis. Naturally the producing companies lost a great deal of money in this way, and as more data became available on the aforementioned factors, the rates were materially increased. As opposed to this tendency, however, there was the equally strong inclination to cut prices in order to meet competition and to get desirable business away from rival concerns. The whole situation was therefore one of storm and strife and finally the larger manufacturers singly and as groups agreed that the end did not justify the means and declared themselves against any further sales on this basis.

One of the manufacturers stated:

Only 20 per cent of the companies operating buses in the United States are of a size which would justify our making such a contract with them in any case. Of this 20 per cent, a large number have become convinced that the mileage purchase plan is not the solution of their problem and they are now buying their tires on an outright purchase plan. We, therefore, feel that it scarcely behooves us to violate the dictates of common sense in a wild scramble for what is after all only a comparatively small percentage of the available business in the country. How much better for us to concentrate our efforts on a sane marketing of quality tires on the tried and proved outright purchase plan!

A few manufacturers still offer the cost-per-mile contract to the large operator and some of the largest fleets of buses in this country continue to be equipped under such agreements. Of course, there are two sides to every story and certain operators may have found after a thorough trial of the cost-per-mile plan that it meets their particular requirements in a satisfactory manner. No effort has been made in assembling the opinions contained in this article to get the operator's viewpoint on the question. The manufacturers alone have been consulted. However, it seems significant that the larger producers have deliberately turned their backs on a marketing plan which may be presented in an attractive light to the operating companies.

Manufacturers who still favor this plan necessarily have confidence in the quality of their product, since they can only profit as their tires attain to good mileage figures.

Business Forecasts Optimistic

Authorities See Good Outlook Immediately Ahead, but Are Loath to Attempt Distant Predictions

General business conditions in the United States continue prosperous and there is an encouraging stability in the trend of prices. However, the note of caution which was heard at the beginning of the year is still sounding on the pitch-pipes of commerce. Unprecedented as was last year's record in practically every line of industry, it cannot be safely taken as a guarantee for a continuance of this state of affairs indefinitely. This is the opinion of observers known for their more sober judgment.

The New York *Times* states:

Tangible evidence of prosperity sometimes points to past, not future, conditions. The basic influence of the 1924 grain harvests was not duplicated in 1925. Our railway traffic and industrial profits depend in large measure on unknown future conditions, notably the crops. In directions where the public's purchasing power has been extraordinary (notably the motor car industry) we have still to discover whether there may not be a saturation point. The capacity and incidental hazards of the country-wide "installment buying" have not yet been tested. As for easy money, such year-end indications as the Reserve Bank rates, the rate on Treasury short-time notes and the 6 per cent for Stock Exchange demand loans (over the year end) suggest that at least the money markets' general trend may have altered.

Broadly speaking, the trend of Stock Exchange prices during January was downward, with several notable exceptions. These were not sufficiently numerous to affect the general averages, however. There does not seem to be any reason to accept this movement as presaging anything more serious than a technical reaction, following advances in many directions which had proceeded too far. This is the opinion of the *Industrial Digest*. As the *Commercial and Financial Chronicle* points out:

Fundamentally the country is prosperous and there are ample funds for all legitimate purposes. If any such thing (as a long-continued downfall) shall come in the future it will be because of definite causes and not because of the mere advance in prices.

None of the accepted authorities, however, seems willing to make definite predictions for more than the first half of the current year. It appears certain that the very momentum of industry which has been built up during past months will carry things forward at a satisfactory rate during the coming spring and early summer. What will happen beyond that point is apparently a matter for mere conjecture, although very definite occurrences would have to manifest themselves in order to make serious inroads into the nation's industrial health this year.

Metal, Coal and Material Prices

Metals—New York	Feb. 9, 1926
Copper, electrolytic, cents per lb	14.275
Copper, wire base, cents per lb	16.00
Lead, cents per lb	9.20
Zinc, cents per lb	8.25
Tin, Straits, cents per lb	63.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.875
Somerset mine run, Boston, net tons	2.175
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.125
Kansas screenings, Kansas City, net tons	2.35
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N.Y., cents per lb.	17.75
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.30
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.02

Babbitt Metal Consumption in December

Total apparent consumption of Babbitt metal in December, based on reports received from 27 firms, was announced by the Department of Commerce to be 5,726,703 lb. as compared with 4,954,683 in November. This consumption is calculated from sales by manufacturers and consumption by those firms (among them several important railroad systems) who consume their own production. In the accompanying table the sales of Babbitt metal are shown separately from the consumption in the producing plants:

1925	Total Apparent Consumption, Lb.	Sales, (By Manufacturers) Lb.	Consumption, (By Producers) Lb.
Jan.	5,683,183	4,620,815	1,062,368
Feb.	5,164,619	4,103,340	1,061,279
March	5,644,288	4,395,901	1,248,387
April	5,126,416	3,928,136	1,198,280
May	5,081,668	4,189,558	892,110
June	5,074,966	4,085,125	989,841
July	5,184,196	3,694,386	1,489,810
Aug.	5,441,823	4,068,706	1,373,117
Sept.	4,621,033	3,579,780	1,041,253
Oct.	5,550,247	4,169,870	1,380,377
Nov.	4,954,683	3,534,026	1,420,657
Dec.	5,726,703	4,758,057	968,646
Total	63,253,825	49,127,700	14,126,125

$9,101,909 Sales by Brill in 1925—Business Holds Up Well

For the year 1925 the combined output of the four plants of the J. G. Brill Company amounted in sales value to $9,101,909.

The combined output for each of the past seven years follows:

1919	$14,210,622
1920	17,537,293
1921	7,647,898
1922	10,177,582
1923	18,167,486
1924	8,721,726
1925	9,101,909

After deducting $560,938 from earnings for all cost of operations, including maintenance and repairs and depreciation, and after setting aside $82,791 out of earnings reserve for federal income taxes, not yet due, there was a net profit of $571,269 for the year.

The amount of work on hand on Feb. 1, 1926, was approximately $4,500,000 compared with $4,521,000 at this time last year.

In his report covering the year, presented to the stockholders at the annual meeting on Feb. 10, Samuel M. Curwen, president of the company, said that during the past year the company continued the active development of various sizes of gasoline and gas-electric self-propelled cars for steam railroads. The development cost of this new product during the year ended Dec. 31, 1925, was approximately $350,000, all of which has been charged against the profits for the year. This new branch

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of the company's business is increasing. More than fifty-five steam railroads have these cars in operation or on order.

Mr. Curwen on Jan. 8 mailed a letter to all of the stockholders of the company outlining the plan and proposal for the reorganization of the company. On Jan. 13 a sufficient amount of stock had been deposited to make the plan operative and, accordingly, the Brill Corporation has been incorporated under the laws of Delaware.

At a meeting of the board of directors of the J. G. Brill Company held on Jan. 29, W. H. Woodin, president of the American Car & Foundry Company, was elected a director of the J. G. Brill Company to fill the unexpired term of W. H. Heulings, Jr., deceased.

At the meeting of the company on Feb. 10, W. M. Hagar, William Clarke Mason and C. S. Sale were elected directors to serve for three years and W. C. Dickerman was elected a director to serve for one year.

The consolidated profit and loss and earned surplus accounts of the J. G. Brill Company for the year 1925 follows:

Total net sales billed		$9,101,909
Cost of sales, including operating, selling, administration and general expenses, and depreciation for the year, less miscellaneous income		8,447,849
Operating profit		$654,060
Less estimated federal and state income taxes for 1925		82,791
Net profit to earned surplus		$571,269
Earned surplus at Dec. 31, 1924		$4,905,308
Add adjustments (credit)		1,200
		$4,906,509
Add profits as above		571,269
		$5,477,778
Less dividends paid:		
Preferred	$320,600.00	
Common	240,510.00	561,110
Earned surplus at Dec. 31, 1925		$4,916,668

Fifty New Cars for P.R.T.

Arrangements have been made by the Philadelphia Rapid Transit Company for the purchase of 50 new street cars from the J. G. Brill Company, Philadelphia. Delivery of this equipment will begin in April and end early in June. The cost of the cars will be approximately $650,000. They are to be of the single-end, center-exit type, many of which are now in service on P.R.T. lines. These cars, together with the 135 buses which have just been ordered by the company, will help to meet the transportation demand which the Sesqui-Centennial Exposition will place upon the transit system.

$687,560 Expenditures in Minneapolis

Expenditures by the Minneapolis Street Railway, Minneapolis, Minn., totaling $687,560 in 1926 as recommended by the street railway and bus committee of the City Council and now approved by the Aldermen means that the company will have to finance the difference between that amount and the budget, which was $568,000 to be taken from earnings. Expenditures will be: For the bus lines, power and mechanical improvements, $267,000; nine re-rail and paving projects, $309,500; special work, $63,000; bridge work, including some paving, $11,000; miscellaneous, $20,000.

As soon as permission has been granted by the Railroad and Warehouse Commission the company will install crosstown bus lines on Lowry Avenue North and 38th Street South and will extend the Bryn Mawr trolley line. Only one long new line is to be built, or extension of the tracks on 42d Street. One of the large paving contracts will be on Nicollet Avenue.

Rolling Stock

Dallas Railway, Dallas, Tex., if the Council approves the suggestion of the city's supervisor of utilities with respect to fares, will put through a program calling for the expenditure of about $1,000,000, an important item of which will be an appropriation for the purchase of 30 Peter Witt cars.

Pennsylvania Railroad System is building eight all-steel multiple-unit cars for suburban service on its various lines. The cars are under construction at the company's Altoona works.

Seattle, Wash.—The City Council recently passed unanimously an ordinance providing for the purchase of fourteen buses, ten to be used in the North End and the others in relief work on lines already established. The ordinance authorizes the issuance of $100,000 in railway department warrants to pay for the new buses.

Track and Line

Trenton & Mercer County Traction Corporation, Trenton, N. J., will install double-track corners at Princeton and Paul Avenues and Princeton and East Paul Avenues.

Northern Ohio Traction & Light Company, Akron, Ohio, did a considerable amount of track construction work during 1925. Right of way was secured from the Wheeling & Lake Erie Railroad for approximately 5 miles and new track was constructed. In Ravenna approximately 1,000 ft. of open track was replaced with heavy T-rail. In Barberton the single track on High Street for a distance of approximately 5,200 ft. has been replaced with double track. In New Philadelphia it was necessary, due to city repaving, to renew approximately 3,000 ft. of single track. In addition to much new construction the company had a very extensive maintenance program. In Bedford repairs were made to the paving on Broadway and approximately 35,000 ties were renewed. Worn-out rails on various curves were renewed. In Akron and Canton especially considerable trackwork was accomplished.

Los Angeles Railway, Los Angeles, Cal., has started the construction of a car track through the North Broadway tunnel. The job was made necessary by the construction of the city hall and civic center in the North Spring Street district. The Broadway tunnel job was authorized recently by the city. It will cost $70,000.

Trade Notes

Griscom-Russell Company, New York, N. Y., announces the removal of its general offices from 90 West Street, New York, N. Y., to the new Murray Hill Building, 285 Madison Avenue.

Universal Metal Box & Products Company, Inc., Newark, N. J., manufacturer of externally operated switches, safety switches, metal cut-out boxes, fuse boxes, electric signs, stair tread lights, etc., has announced the appointment of the Fred Rowell Company, Inc., New York City, as its sales agent in the metropolitan district, including northern New Jersey.

Timken Roller Bearing Company has promoted R. C. Brower to the position of assistant to H. J. Porter, vice-president in charge of sales. Mr. Brower became associated with the Timken Company in 1916, as district manager of the Bearings Service Company, with offices in Detroit. At the dissolution of this company, in 1922, the Timken Roller Bearing Service & Sales Company was organized. He then went to Canton, the headquarters of the new company, as assistant general manager. This position he held until his present promotion. The present offices will be maintained at Canton.

G. L. Hulben has been added to the sales force of the Chicago branch of the Ludlum Steel Company, Watervliet, N. Y. For years Mr. Hulben has been connected with the Chicago sales division of a large tool steel manufacturer.

Southern Wheel Company, Pittsburgh, Pa., has opened a new office in Washington, D. C., at 818-819 Munsey Building. This office will be in charge of F. C. Watkins, special representative, who has been moved from Atlanta, Ga. The Atlanta office, at 1413 Candler Building, will be in charge of C. C. Cox.

Advertising Literature

Westinghouse Electric & Manufacturing Company has issued a 112-page publication, describing the proper switching equipment for alternating-current power stations. This special publication, 1541-C, deals with the fundamentals to be borne in mind when laying out a switchboard, and describes in detail the various types of switching equipment. It is illustrated with diagrams and halftones.

Sullivan Machinery Company, Chicago, Ill., has issued bulletin 81-I, featuring two new types of Sullivan concrete breakers. These are DW-221, a 75-lb. heavy-duty buster, and DP-221, a 48-lb. light buster for concrete breaking in street openings, demolition work of many kinds, etc. The term "buster" has just been registered as a trademark to designate this type of tool. "Speed Up with Air" is the title of another bulletin of sixteen pages, which illustrates Sullivan portable air compressors and shows many applications of Sullivan rotators, hammer drills, clay spaders, concrete breakers, portable hoists, etc. Tables of capacities and specifications are given.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

MORRIS BUCK, *Managing Editor*

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Car Floors Can Be Given Increased Attention

FLOOR coverings of some rubber material or linoleum are being tried by many railways to replace the ordinary wooden floor with raised slats. This improves the appearance considerably and has an added advantage in reducing noise. Some difficulties have been experienced from uneven wear and a tendency to warp and buckle. Costs of keeping such floors in good repair are not available, but definite figures as to the cost of maintaining them are looked forward to with interest.

Trapdoors are considered an eyesore by most transportation departments but a necessity by the mechanical departments. Since they are required for proper inspection of motors they should be given particular attention so as to harmonize with the remaining floor area and not create the impression on passengers that they are something to be avoided.

Whatever type of floor is used it requires careful design to prevent the openings for trapdoors from gradually showing worn and soiled edges. Of course the openings are included for a specific purpose, and if they are not used they are of no value. But care in the selection of the floor covering and care in maintaining it will do much to prevent unsightliness.

Removal of Obstructions from Car Interior Should Give More Pleasing Impression

VARIOUS arrangements of stanchions and barriers have been used on car platforms for directing passenger movement. By separating incoming and outgoing passengers less confusion and more satisfactory operation usually result. In general, however, such barriers are looked upon with disfavor by passengers. People resent the impression of being penned up or herded. Several railways have improved conditions by a removal of some of the barriers and a rearrangement of the remaining ones. The change can be made in a manner that will remove the source of annoyance and still retain most of the good features of the plan.

The problem of keeping stanchions and barriers in good condition is a difficult one, but nevertheless it should receive more attention. Porcelain enameling appears to be satisfactory only for straight lengths of pipe. It also is likely to chip, and when it does so the exposed iron is unsightly. Aluminum and brass oxidize and become unsightly, galvanizing is unsatisfactory and iron pipes with enamel paint leave much to be desired. Light colors, while they have a most pleasing appearance when kept fresh, require constant cleaning. Dark colors are easier to maintain but do not create the pleasing impression that is so desirable when a passenger boards the car. Altogether designs of stanchions and barriers leave much room for improvement.

The arrangement of railings and hand straps inside the car is another thing that may create an unfavorable impression on the passengers and give a ragged, unfinished appearance to the car that is entirely out of harmony with the modern trend toward light weight and pleasing design. A judicious arrangement of such equipment will increase the range of vision and give a more satisfactory appearance.

High-Pressure Salesmanship Needed in the Electric Railway Field

ONLY a few years ago efforts on the part of electric railway executives toward the merchandising of transportation were practically nil. The street car afforded the only convenient means of transportation for the majority of urban and interurban passengers. The electric car had no important competitor and the passenger no choice in his method of travel, as it was necessary for him to utilize such facilities as existed. Knowledge that the public was compelled to use electric cars became so firmly imbedded in the rank and file of street railway employees that it has been most difficult to change this attitude. Advent of the private automobile and later the luxurious bus created an entirely new situation. The riding public has in many cases been in a position to choose its transportation medium, and naturally its choice has been with the more attractive and pleasing vehicle. Passengers are no longer satisfied with any antiquated, noisy, hard-riding vehicle on wheels, but demand speed, comfort and cleanliness. It is only natural that the private automobile should be used extensively under unfavorable conditions.

Recognition of the existence of serious competition has served to awaken the industry from the self-satisfied attitude which has been quite prevalent. It has been said that next in importance to doing the right thing is advertising that you have done the right thing. Earnest effort to improve railway service, it is believed, exists in every street railway organization, but this effort will not produce the desired results if achievements are not effectively placed before our customers. Railways have an article to sell; the sales organization exists. It must, however, be organized and it must be made to function.

High-powered salesmanship under able leadership is required in the transportation field to the same degree that it is required in any manufacturing field. No manufacturing company, no matter how efficient the

This is the issue in February that is devoted essentially to maintenance subjects

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productive organization might be, would expand and grow without a highly-trained sales department. The railways have a product to sell which is in natural demand, and this demand can be capitalized only through effective salesmanship. Every employee who comes in contact with the public should be an enthusiastic member of this organized sales force. When this has been accomplished, the private automobile will be used to a lesser extent, particularly in crowded cities, street car riding will increase and net revenues will show decided improvement.

Substitution of Car Names for Numbers Presents a Problem for Master Mechanics

SEVERAL electric railways have recently adopted the practice of bestowing names on their passenger cars in place of the old-fashioned numerical designations. This change deserves careful consideration from two angles. Will it have a beneficial effect in popularizing the transportation service? Will it add to the problems of the master mechanic by complicating the classification of rolling stock?

From the transportation standpoint results have shown that there is a real advantage in using names on cars rather than numbers, according to several railway managers who have adopted the practice. Perhaps it has a tendency to personalize the service by giving each vehicle a definite individuality. Use of local names appeals to local pride. The mere novelty of the scheme has a certain appeal. In any event the public seems to take kindly to the use of car names.

From the standpoint of the master mechanic the change undoubtedly involves some difficulties. In this connection it is interesting to consider the practices of the Erie Railroad and the Pullman Company. For a number of years past it has been the custom of the Erie to place the name of the engineer on the cab of one locomotive of each division instead of the number. This special recognition is believed to improve the morale of the engine man. The locomotive, however, retains its original number and is known by this number in all the records of the mechanical department.

Identification of the rolling stock of the Pullman Company, which is known only by name, is a more difficult problem. Every car has a plan number in addition to the name. For example, the latest twelve-section drawing room sleeping cars are known as plan 3410. A descriptive list is printed periodically and distributed to the mechanical department, showing the names, plan numbers and types of brakes, couplers, trucks, electric fixtures, water and heating systems with which the cars are equipped. Information is also given as to the exterior design of the cars. In addition, all of the different terminals are furnished with very complete catalogs of parts, illustrated with photographs of each part. This facilitates the identification of the part and reduces the liability of wrong replacement parts being furnished.

Since the number of electric railway cars identified by names is likely to be comparatively small on any one property, the method used by the Erie seems to be the easier solution of the master mechanic's problem. It will be well worth while, however, to give due consideration to this question at the very beginning, because the difficulty of keeping track of the kind of parts required will increase rapidly as the number of names increases.

The Manufacture of Parts by Railways Is Often Poor Economy

HOW often the question has been asked as to whether or not operating companies have exceeded their proper field of effort in undertaking a large-scale manufacture of parts! Walking into the erstwhile maintenance shops of some railways one is struck with the feeling that he has by accident happened upon the plant of an equipment manufacturer. Shiny new parts are to be seen in every direction.

But—and of course there must be a but—it is well to consider just where this situation is leading. To say that circumstances never justify the manufacture of parts by operating companies would be absurd. But it would be equally foolish to cast discretion to the four winds and to enter upon a period of stubborn competition with the established manufacturers. Competition in itself, if limited to proper bounds, stimulates a healthy condition in any industry. However, care must be observed in steering clear of what may at first glance appear to be a means of effecting real savings in manufacturing costs, but which may later manifest itself in its true colors as a costly anomaly.

Were it possible for individual companies to take upon themselves the task of manufacturing all of the widely diversified products needed in their operations and to carry out this task quite as cheaply and as effectively as the regular manufacturers are able to do, then would the latter firms be hard put to it to defend their economic prerogatives. But under the existing order of things this is manifestly impossible. Each year the manufacturers spend vast sums of money in research and development programs. Since the cost of such work would be far beyond the reach of individual companies, the immense value of all this engineering endeavor would be lost to the industry.

Shop superintendents and purchasing agents of the various companies are frequently deluding themselves concerning the true economies to be effected by undertaking the production of new equipment and replacement parts. It is simply a matter of accurate bookkeeping. Instead of fairly apportioning the item of shop overhead between maintenance and new parts manufacture, they have placed the entire burden upon the former. This has resulted in an absurdly small apparent cost for manufactured parts, as shown on the books.

Right Materials Essential for Armature Repairs

SO MUCH depends on the perfect functioning of a railway motor armature that it is essential to keep it in as good operating condition as possible. The modern armature is a rugged piece of apparatus, even though the wires, commutator bars and insulation are relatively delicate. Motor manufacturers go to great pains to build armatures correctly. They have done a great deal of development work covering a long period of years, and have profited greatly by study of the service records of many armatures.

Since even the best of armatures will fail in time, it is necessary to repair them so that they will once more do their work as at first. In practice, however, many railways do not put them back into their original condition. Frequently other materials are employed and

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other methods of winding are resorted to than those developed by the manufacturer. While some of these substitute practices are excellent, in general it may be stated that they cannot produce results better than the original.

An article by Jesse M. Zimmerman in this issue, which gives in detail the practice of one manufacturer, is well worth the attention of the master mechanic and armature foreman. While the practice of other manufacturers may differ somewhat in detail the general principles are the same. Close adherence to such methods should result in far less failures than are common on some roads.

Hope Springs Eternal in New York City

MAYOR WALKER of New York hopes to negotiate a city-wide bus franchise with a 5-cent fare clause, it is said. Such optimism is truly remarkable. Few of the forty-odd applicants for franchises have offered to carry passengers for 5 cents, and it may be doubted if those who have offered could actually carry out any such plan. Only a short time has elapsed since the Tompkins Bus Corporation on Staten Island found that it could not operate profitably on a 5-cent fare and increased its rate to 10 cents. Operating conditions on Manhattan Island are more difficult than on Staten Island. Due to the prevailing traffic congestion the speed would necessarily be slow and the cost of operation correspondingly high. In recent years many trucking concerns in New York have substituted horse-drawn vehicles for motor trucks to cut down the expense of time wasted in traffic jams.

It is said that one of the chief advantages of a city-wide franchise would be that the operator would take the lean lines along with the fat ones. At a 5-cent fare, however, it's a safe guess that most of the lines would be lean.

A Good Name Cannot Be Measured in Dollars

PUBLIC relations men have for years been preaching the value of square dealing with the officials and residents in a community served. They point out that consistent adoption of this policy has a lasting value. But it is not so often that they have the opportunity to point to tangible results that show just how much influence such a policy has on a utility.

Seldom has there been an expression of opinion so favorable to a utility and its management as that given J. N. Shannahan and his associates on the occasion of their sale of the Newport News & Hampton Railway, Gas & Electric Company. The local newspapers have gone to great length to express editorially the sentiment of the people in the community. "The company has never attempted to dicker with the municipal bodies of this section," says the Newport News *Times-Herald.* "To the contrary, it has treated those bodies with consideration, has kept no secrets from them, has laid its case in frankness and confidence before them whenever any emergency in its affairs has arisen. . . . In short, the company has made itself part and parcel of the community and has heartily co-operated with the people in all movements and enterprises for the common good. It has been a good and helpful partner and has rendered service in many directions outside of its immediate sphere of activities."

While praising the work of the company, the same newspaper points out particularly Mr. Shannahan's leading part in it. The Newsport News *Press* goes even farther, saying, "It is not in disparagement of the other officers to say that this is due primarily to the integrity and the fidelity of President Shannahan. He is an upright man and a loyal citizen. He has dealt with the community not in selfishness but in the spirit of fairness and generosity."

Such praise is praise indeed. But the value of this mode of conduct is not overlooked by the *Press.* "His indorsement of any enterprise is sufficient to inspire the confidence of investors." That is the acid test. The results that have been obtained by Mr. Shannahan show that his methods should be studied by other operators.

Maintaining Axle Bearings of Paramount Importance

HEAT generators is the name given to bearings by one workman. This is true. The object of the manufacturer is to design the bearing to generate as little heat as possible, and that of the maintenance man to keep it running on a low production basis—as to its byproduct, heat.

Attention is again called to the information on bearing practice developed at the January meeting of the Metropolitan Section of the American Electric Railway Association. The papers, which were abstracted in this paper, issue of Jan. 16, showed that more attention should be given to the subject of bearing wear and replacement. The range in wear over a given period by different roads under quite similar conditions shows that much can be done by the average road to get less wear.

Oiling is also important. A sufficient flow to keep the bearings lubricated is an essential that never should be overlooked. Too many operators save oil at the expense of bearing metal, with the result of poor performance. The work of packing bearings is so important that good men should always be assigned to it and they should be given the best of instruction.

Perhaps the bearings most difficult to maintain are those supporting the driving motors on the car axles. Necessarily these must be split to allow easy removal of the motors. They receive a maximum of thrust from side to side as the axles are moved, due to track imperfections or curves and special work, as well as due to the shifting of the motor itself from side to side. The weight is also unsprung.

An article published in this issue shows the bad effects of excess bearing clearance on the meshing of gears. Even a slight increase in the distance between centers throws the gears out of alignment and causes excessive wear. When the bearings are worn so that the centers are ¼ in. too great, as happens frequently, conditions are far more serious.

Despite all these difficulties and opportunities for undue wear it is these bearings that determine the life of gears and pinions and the incumbent noise arising from their operation if gear centers become spread due to wear in the bearings. Care should be taken of all bearings, their lubrication and maintenance as well, but particular care should be given to the axle bearings if low gear and pinion cost is desired.

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Rail Bond Maintenance

Several Types of Bonds Have Been Tried in the Electrified Sections of the Chicago, Milwaukee & St. Paul Railway—The Maintenance Methods and Organization Used Are Described

By Charles G. Lovell

Assistant Engineer, Electrification Department, Chicago, Milwaukee & St. Paul Railway, Seattle, Wash.

WHEN plans for the electrification of the mountain divisions of the Chicago, Milwaukee & St. Paul Railway were prepared, it was decided to use a bond with an expanded terminal, expansion being secured by means of a tapered pin driven through the hollow terminal of the bond. This type of bond had been in use on a number of important roads and at that time was probably the preferred form of rail bond for steam railroad electrification. The consideration which was felt particularly important in selecting this type of bond was that it provided a bond which the section crews could install readily, as most of the tools required would already be normally in their possession.

All bonds were single conductor, 250,000 circ.mil capacity, made up of 61 wires. The terminals were $\frac{7}{8}$ in. in diameter and $1\frac{1}{8}$ in. long under the head. The hole through the terminal was 0.406 in. and was expanded with a $\frac{1}{2}$-in. diameter steel pin. The bonds were installed in rails of 85 and 90 lb. standard sections on the main line, and on miscellaneous rails from 56 lb. to 85 lb. on the side tracks. In general, 100 per cent, Bonzano, angle and Weber joints are found on the 90-lb. rail; continuous and angle joints on the 85-lb. rail; and angle joints on the smaller rails.

Three forms of bonds were used, depending on the nature of the rail and joints. Where space under the splice bar was sufficient, and conditions permitted the removal of the bar, a concealed bond was used. This bond was provided with a crimp between the middle bolts to provide for expansion and flexibility. Where there was sufficient space under the splice bar, but it was undesirable to remove the bar, a bond with one welded and one detached terminal was used. One joint bolt was removed to allow the passage of the crimp, and the bond was pushed into place under the bar. The loose terminal was then soldered on and applied to the rail in the usual manner. On the remaining rails exposed bonds were used enough longer than the splice bars to provide the necessary clearance and to permit stapling the bonds to the ties.

Double Bonding Used for Large Currents

Exposed bonds were installed on the inside face of the rail, as this position appeared to result in less damage to bonds in cases of derailment. Where the contemplated current per rail was more than the carrying capacity of one bond of the standard size, double bonding (i.e., two bonds per joint) was used. In exposed bonding, one bond was identical with those used in single bonding and the second was enough longer to extend beyond the terminals of the first. When concealed and semi-concealed bonds were used, the two bonds were identical but on opposite sides of the rail. Both rails of the main line were bonded. On side tracks one rail only was bonded, but provision was always made for two connections of such tracks to the return circuit.

The concealed and semi-concealed bonds had extended lengths of approximately 20 in. and 38 in., respectively. The single exposed bond was, in general, 37 in. in length, and the second bond in double bonding was 42 in. On account of some of the angle bars on the lighter rails being six-bolt bars, special bonds of longer lengths were occasionally required

Since the contact resistance of this type of bond depends on the conditions of the contact surfaces and on the pressure obtained between surfaces, the care with which the bonds were applied was very important. Carefully prepared instructions were furnished to both the installation forces and to the operating forces that were required to take care of bond replacements. It was required that the terminals be cleaned with fine emery cloth and the hole in the rail wiped out with a piece of clean, dry cheesecloth immediately before the bond was applied. No lubricant was allowed on the drill bits. To make certain that a good fit was obtained, a plug gage was provided and all holes gaged. If holes were accidentally drilled oversize, the bonds were installed with an oversize pin. However, great care was used in regrinding the bits so as to guarantee holes of proper diameter. Careful supervision of all parts of the installation work was found very desirable.

Some Special Equipment Used for Drilling

For drilling the holes for the application of the bonds, hand-operated drills were used throughout on the first two divisions electrified. On the Coast division, however, a very large proportion of the work was drilled by air-driven drills, the power being supplied from an Ingersoll-Rand air compressor. A special drill carriage was made up to hold, guide, and feed an air drill. The use of this equipment accomplished a very decided saving in the cost of application of the bonds and was used with good success. It was only when the necessity for rushing the work required establishing additional bonding crews and compressors were not available that hand drills were used on this division. The saving secured by the use of the compressor is reflected in the cost of applying bonds by the two methods, the cost per bond, using hand drills, being about 49 cents as compared with a cost of about 31 cents for bonds applied where the holes were drilled with air. These are direct labor costs only (including foreman and all men in crew) with a laborer's rate of 53 cents. Adding other labor charges such as repairing equipment, moving, etc., the above figures should be increased by 13 cents, and to this must be added tools, equipment, camps, transportation, etc.

When one compressor was being used the crew usually consisted of one foreman, two drillers, two gas-

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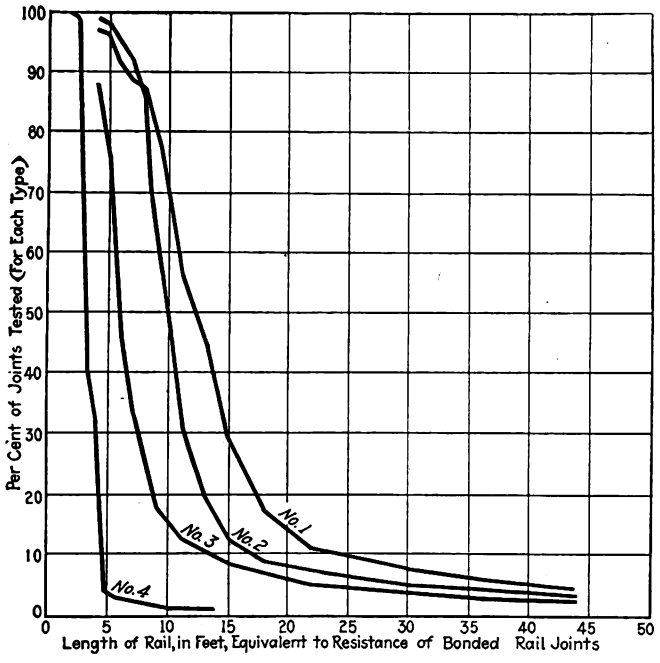
engine men, eleven helpers, and one camp helper. The cost when applying concealed bonds was about double the above.

After the initial installation was completed by the electrification department, the roadway forces and the signal department were made jointly responsible for the maintenance of the bonds. Section crews were to replace bonds where rails were renewed, but the signal maintainer was to be notified in each case so that he could inspect the work. Full instructions in regard to installing the bonds were incorporated in the special instructions which were issued covering the electrical operation. These instructions were placed in the hands of all section foremen, as well as all other employees having to do with electrical operation. The instructions covering the installation of bonds were substantially full specifications for maintenance and renewals.



Resistance of Bonded Rail Joints—Missoula Division

Special tests were made to determine electrical resistance on 2,725 rail joints, as follows:

Curve No.	Type of Bonds	No. Joints	Bonds per Joint	Weight of Rail
1	Pin type	1,143	1	85 lb.
2	Pin type	515	1	90 lb.
3	Pin type	809	2	90 lb.
4	Welded	258	1	85 and 90 lb.

All measurements made between points 30 in. apart.

Curves show for various rail lengths, percentage of rail joints with resistance equal to, or greater than, such lengths.

Where new rail was laid or other causes required the bonds being replaced, new bonds, drawn from the storeroom, were used in every case, the bonds removed being sent to the state department for re-forming. At first these used bonds were merely inspected and strands straightened, and when again replaced in rails, special oversize pins were used. The amount of oversize of these pins was considerably more than that of the pins classed as oversize and used, where necessary, in the application of the new bonds. A method was later developed whereby the terminals of the second-hand bonds were reshaped so as to bring the tubular portion of the bond back to its original length, and inside and outside diameters. These bonds were then handled in the same manner as new bonds. A very appreciable saving in the cost of replacing bonds was secured by this practice of recovering used bonds.

This method of repairing the bonds overcame several serious objections to the use of second-hand bonds. Previously, considerable confusion had arisen through the necessity of using various sizes of pins, extra oversized pins being used in new bonds or the small oversized pins in used bonds. Even after being applied with the proper oversize pins, poor contact was secured in many cases, as the original shape of the terminal had been changed by the process of application and removal, although a tool had been especially designed for removing the terminals. It is, of course, very costly to scrap the bond when replacement is necessary. To scrap a 37-in. bond and apply a new one involved a net expenditure for material of about $1.15, whereas the cost of repairing was only 70 cents.

In addition to the inspection which was expected from track forces and signal maintainers, a bond repair crew goes over all the trackage, inspects the bonds and replaces those found defective. The latter are usually bonds which had been installed by the section crews in connection with rail replacements. The personnel of these crews is subject to rather frequent replacement and it is difficult to make even the older men appreciate that more than a mere tight connection between rail and bond is necessary. Our experience with the installation of bonds by section crews is, therefore, rather unsatisfactory.

Meanwhile, the gas weld bond had been developed to such an extent in interurban and similar service that we decided to determine its suitability for our own trunk-line conditions. Its attractive features were its relative cheapness, more reliable and permanent bond and rail contact, assuming proper installation, and greater ease of inspection.

Conditions Met by Gas-Weld Bond

Our problem was, mainly, to determine: First, whether the welding would have any deleterious effect on the steel of the rail; second, whether bond maintenance and replacements could be handled without ultimate uneconomical increase in existing maintenance forces, and third, whether the bond itself would stand up under the actual service conditions.

In order to determine the effect on the steel of welding the bond to the rail, the railway company had microscopical and chemical examinations of the steel made by a competent testing laboratory after a bond had been applied. The observations indicated that no serious injury was done to the rail as a whole. The experience of other companies was also studied, and the conclusion reached was that the welded bond could be tried safely.

In changing to this type of bond it was not possible to have the application made by the section forces and, therefore, it was arranged that the signal maintainers should be supplied with welding equipment and do the welding work. This arrangement has worked out very satisfactorily. The men have learned the operation of welding quickly and they are supplied with small tanks of welding gas, which may be carried easily on the gas cars commonly used by signal maintainers. The signal department is thus placed in charge of all bonding and bond maintenance, whether or not the bonds are on rails involving signal circuits. This removes an undesirable condition previously existing wherein the signal maintenance forces were responsible for the condition of the bonds without having direct supervision over the forces which applied the bonds. In addition to the bond maintenance work done by the signal maintainers who have

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fixed headquarters, there are the bond testing crews previously mentioned that move from place to place and whose duty it is to make a routine test of all bonded joints and replace defective bonds. These crews are used also wherever there is extensive rail relaying work and the application of a number of bonds is required.

Saving Results from Use of Gas-Weld Bonds

The cost of applying the bonds varies, of course, with the conditions under which they are applied. Taking, however, for the sake of comparison, a condition where a number of bonds are to be applied in rail re-laying work it is found that the cost of the gas-weld bond is for the bond, gas, etc., about 70 cents, and for labor 38 cents, or $1.08 per bond. The cost of the 37-in. pin-type bond would be for materials $1.50 and for labor $0.45, or a total of $1.95. Thus a saving of about 87 cents per bond is realized. This saving is increased in territories where double bonding is used with the long bond, since a single bond only is required when the shorter bonds are used. This fact was determined by calculations of the relative heat conducting capacity of two types of installations, the favorable results of which were afterward confirmed by actual trial.

The welded bond, when properly applied, has a low contact resistance and this resistance does not increase with age. A defective application is usually more readily detected than with a pin-type bond, although we have had some cases where the steel sleeve of the bond was welded to the rail, but the strand was not, so that, although the bond appeared all right, the resistance was high, since the sleeve is not, in manufacture, welded to the strands. Such cases of defective welding appear to be very few and will decrease in number as the welders become more proficient.

Application of gas-weld bonds was started in 1921, since which year practically all new rail laid has been gas-weld bonded and a large part of the maintenance work, particularly in the past two years, has been done with this bond. A No. 0000 bond, 7 in. long, with pressed steel terminals is used, formed U-shape and welded to the ball of the rail.

Tests Show Results Accomplished

The experience to date with it has been very favorable, and unless there are objections not yet apparent the use of this bond will be continued. It has not been in use long enough yet to determine fully to what extent breakage of strands will be experienced or to be sure what the ultimate effect of welding will be on the rails, but these points were taken into consideration before the use of the welding process was begun, and it is not expected that sufficient trouble will be experienced from these causes to overcome the advantages of this type of bond.

In conclusion, it may be interesting to give the results of a special investigation which was made in 1924 of the bonding conditions on a considerable portion of our older electrified line. Over 3,000 bonds were tested at points so selected as to indicate the average condition of the bonds. Measurements were made by using two voltmeters, one indicating the drop in the bond and the other the drop in a fixed length of rail. The result of this study is shown on the accompanying curve, which shows the percentage of bonds with conductance less than the conductance of the stated rail lengths. The original pin bond installation, much of which still exists, was made in 1914 and 1915. The gas-weld bonds have, as already stated, all been installed within recent years.

Hot Brine Clears Car Tracks Quickly

Motorists Unconsciously Aid Snow Removal Along Lines of the Cumberland Traction Company—Tracks Cleared in One-Third Time Otherwise Needed

COLD dry snow to a depth of 14 in. covered the tracks of the Cumberland Traction Company, Bridgeton, N. J., when the blizzard of Feb. 11 ended. One plow and one sweeper, the snow-fighting equipment of this railway, had been put in service soon after the storm began and they experienced no difficulty in getting through on the 10-mile interurban line to Millville. After returning to Bridgeton the local lines were cleared. The high wind, however, drifted the dry snow badly and the rails were soon covered again to a considerable depth. The path cleared by the sweeper was immediately chosen by the local motorists when they began to operate the following morning. A slight rise in temperature softened the snow and it was soon packed down hard on the tracks to a depth of about 4 in. The railway equipment proved powerless to remove this coating from the rails.

Under similar circumstances the attitude of the former management of this company had been "the Lord put it there, let the Lord take it away." The present manager of the road, Clayton W. McPherson, remarked, however, that while he had a great deal of faith in the Lord, he was not sure just when the ice would be taken away, so the company hired laborers with scrapers to try to remove it. One gang of twelve men took six hours to clear 3,900 ft. of track. Another gang of fifteen men at the Millville end of the line took nine hours to clear 4,800 ft. Salt was sprinkled both before and after cleaning.

Progress by this means was so slow that the manager decided that some more effective means must be employed. Motor trucks were borrowed from a local ice cream plant and filled with a boiling hot mixture of salt and water. This escaped onto the tracks through the vents provided to allow melted ice to run away. The first tank wagon was started late in the afternoon in the worst downtown section. Automobile traffic continued to follow the car tracks and churn up the salty mixture. In 30 minutes the steel rails were again visible. Soon the 14 miles of the company's route was open and the cars were running. It is believed by the management that at least another 24 hours would have been required to open the lines without the use of hot brine.

Previous to the application of the brine the men cleaning the track averaged about 31 ft. per man per hour. After this treatment had been applied it is conservatively estimated that progress was three times as fast. Altogether 23 loads of brine were used by three trucks. Each load consisted of approximately 400 gal. of water and 460 lb. of salt. The total cost of ice removal by this method was approximately $1,000.

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Rewinding Railway Armatures

Descriptions, Functions and Location of Armature Rewinding Insulation, Core Insulation and Banding Material Will Help Repairman to Do a Better Job

By Jesse M. Zimmerman
Engineering Department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

EACH piece of insulation used in rewinding armatures for railway motors has a definite function to perform and accurate location is important. Insufficient insulation at some points may result in short circuits or grounds, while too much may cause the coils to build high and make winding difficult. Information regarding the material used in winding the Westinghouse type 306 railway armature has been gathered and is given to help the repairman who rewinds this and similar type armatures.

Material used for rewinding is divided into three groups, (1) core insulation, (2) winding insulation and (3) banding material. When making minor repairs on an armature, it may be necessary to use only the banding material. In rewinding an armature sometimes it is unnecessary to use the core insulation, so that the rewinding insulation and banding material only are required.

In order to present the information so that the repairman can see its proper location in the winding a diagram and halftone are used as illustrations. The numbers for the parts in the illustrations will enable the reader to follow the description more intelligently.

Core Insulation

Item 1.—Ninety-six tan-treated* cloth caps, 0.010 in. thick cut in 8 sections from a circular piece, 12 in. inside diameter and 18½ in. outside diameter. Each section has four fingers cut 1½ in. deep from the center. These caps are placed against the end bell in three layers; each layer is four strips deep. They are held against the end bell by tan tape, Item 2, which is used to cover the coil supports. On high-voltage motors micarta molded strips are used to cover the coil supports and end bell.

Item 2.—Three rolls of tan-treated cloth tape, bias cut. This tape is used to cover the coil supports and holds the tan-treated cloth caps.

Winding Insulation

Item 3—Fifty-eight fishpaper U-pieces, 0.056 in. x 3½ in. x ⅝ in. grooves are provided in both ends of the slot in the armature core for fishpaper U-pieces. These U-pieces protect the ends of the coils where they leave the slot.

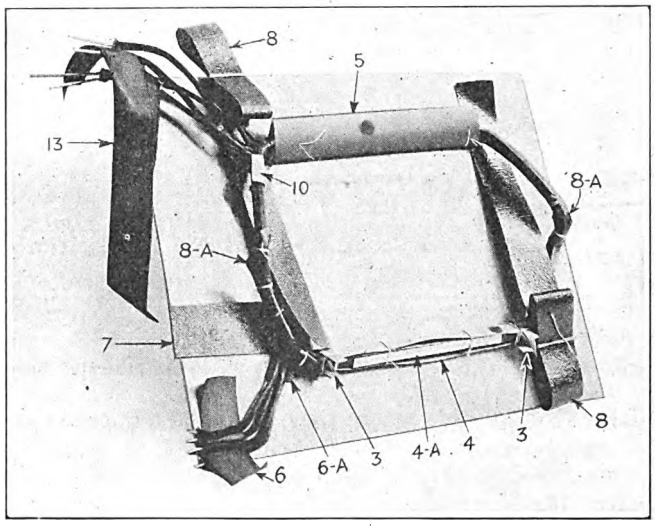
Item 4.—Twenty-nine fishpaper cells for bottom coil, 0.023 in. x 2 in. x 10 in. Separate cells are used for the coils in the bottom of the slot. This cell is placed over the coil and driven into the slot with the coil.

Item 4-A.—Twenty-nine fullerboard pieces between top and bottom of coils, 0.030 in. x ½ in. x 6 in. This strip separates the top and bottom coils in each slot.

*This is a trade name for tan-colored, oil-treated linen or other cloth.

Item 5.—Twenty-nine fishpaper cells for top coils, 0.023 in. x 4½ in. x 10 in. This cell is large enough so that it extends above the laminations. A separate cell is used for the top coil so that if the top coil has to be repaired it can be done without disturbing the insulation of the bottom coil. When the top coil is replaced a new cell is used.

Item 6.—One strip of treated surgical tape, 0.023 in. x 2 in. x 42 in. This tape is woven between the bottom leads back of the commutator neck. It keeps the leads separated at this point.



Materials Used to Insulate Armature Coils

Item 6-A.—Twenty-nine strips of treated oil duck, 0.035 in. x 1 in. x ¾ in. This strip is placed over No. 2 and 4 leads where they leave the front bottom corner of the coil. Leads Nos. 1 and 3 will lay on top of this strip. This separates the leads where they leave the coil, thus preventing the leads from shorting at this point because the leads form a double layer.

Item 7.—Twenty-nine strips of treated oil duck, tapered, 0.035 in. x 2 in. x 4½ in. short side, 6 in. long side. These strips are placed between the lower leads and the bottom half of the front diamond part of the adjacent coil. The tapered end is anchored and brought up between the bottom half of the two front diamond parts of adjacent coils. After the coils are laid and the bottom leads connected the ends of these strips are brought around the extreme end of the diamond and fastened with friction tape. This strip protects the bottom leads from the bottom of the adjacent coil besides separating the coils where they make the bend at this point.

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Item 8.—Two strips of treated oil duck, 0.035 in. x 1¾ in. x 42 in. These strips are placed between the top and bottom halves of the diamond parts of the coil, for the front and rear of the armature. They serve to separate the top half of the diamond part of the coil where it crosses the bottom half of the diamond part of the lower coil, which is running in the opposite direction and is of a different potential.

Item 8-A.—Fifty-eight treated duck pieces, 0.035 in. x 2 in. x 3 in. These strips are placed over the drop loop of the diamond, both front and rear, where the top half crosses the bottom half of the preceding coil. It serves as a separator where the insulation is most apt to be damaged in winding.

Item 9.—This is a fiber wedge which fits over the coil in the armature slot.

Item 10.—Twenty-nine strips of fishpaper, 0.015 in. x 1½ in. x 1¼ in. These strips are bent to an L shape so that they will fit between the top halves of the front diamond parts of two adjacent coils. This strip insulates the top leads where they cross the adjacent coil.

Item 11.—Friction tape to hold Item 7 in place.

Item 12.—Tan-treated cloth tape used as a filler.

Item 13.—Four strips of surgical tape (not treated), 2 in. wide x 0.020 in. This strip of surgical braid is woven alternately between Nos. 2 and 4 leads of each coil, as these leads are connected first, after which it is then wound once over the top of these leads next to the commutator, then woven alternately between leads 1 and 3 of each coil. This separates adjacent leads at the top with two layers of surgical braid. This is essential because the cotton insulation is scraped from the leads when they are tinned. It must be wound tight so that it will keep the leads firm. Some types of motors have the leads taped with friction tape.

Banding Material

Item 14.—One-half pound of tan-treated cloth tape. This tape is used to cover the top leads. It must be wound tight so that it will hold the leads firmly, as vibration of the leads at this point may result in broken leads.

At this point of the winding the armature must be heated to 100 deg. C. and banded with temporary bands while it is hot, thus drawing the coils down firmly.

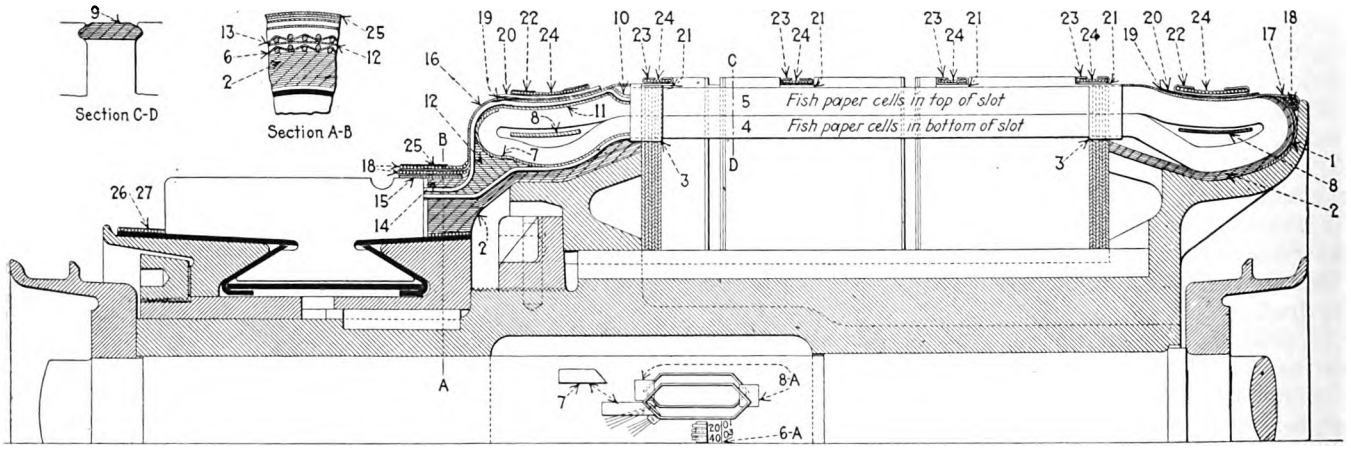
Item 15.—Seven strips of mica, 0.008 in. x 1 in. x 6 in. These strips are placed over the commutator neck to prevent the solder from flying out of the slots in case it melts. It is held in place by Items 16 and 18.

Item 16.—No. 49 drilling hood is placed over the mica strips which cover the commutator neck and is held in place by a layer of No. 12 thread, which is wound tight around the armature at this point and is painted with an air-drying varnish. It is then doubled back over the first layer of No. 12 machine thread. It is covered by a second layer, wound tight on the thread. This layer of thread should cover the drilling hood to the point where the leads bend up to go over the ends of the coil. The top lap of the coil is sewed.

Item 17.—One drilling hood, 0.017 in. x 9 in. x 48 in. The tan-treated caps (Item 1) are laid over against the ends of the coil and the one edge of the hood is firmly anchored by a tight woven band of No. 12 machine thread. The hood is doubled back over the coils.

Item 18.—Two hundred and fifty yards of No. 12 machine thread.

Item 19.—Two strips of fishpaper and mica, 0.012 in x 2 in. x 96 in. After the temporary band, which was used to draw the ends of the coils down, is removed, the drilling hood is drawn tighly over the coils. One strip of fishpaper and mica is placed around the hood.



Types of Material Used for Rewinding Armatures

Item 20.—Two layers of surgical tape, 0.020 in. x 2 in. x 4 in. A strip of surgical braid covers the fishpaper and mica strip. This braid is covered with a tight layer of No. 14 banding wire (Item 24), with twelve tin clips (Item 22) placed under the banding wire, the ends being bent over and soldered to the banding wire. The above outlined operations covering Items 19, 20, 22 and 24 are identical for banding over the front and rear coil support. The two outer core bands are used to anchor the ends of the front and rear drilling hood.

Item 21—Four strips of sheet tin, 0.012 in. x ⅞ in. x 48 in. These strips of sheet tin are placed over the coils in the banding slot on which to wrap the banding wire (Item 24).

Items 22 and 23.—Tin clips. These tin clips are placed under the bands, bent over and soldered to the wire to keep the banding wire intact.

Item 24.—Wire used for banding.

Item 25—Two layers of surgical braid wrapped tight and sewed in three places serve as a protection to the No. 12 machine thread (Item 18) against flashes.

Items 26 and 27.—Italian twine. One layer of four-ply Italian twine, saturated first with No. 3 and then No. 4 shellac and well ironed with a hot soldering iron after each application of shellac, makes an oil and moisture proof V-ring protection upon which a minimum amount of dust will adhere.

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Excessive Gear Spacing Causes Trouble

Model Shows How Noise and Wear and Breakage of Teeth Follow Rapidly with Increases in Distance Between Centers of Gear and Pinion

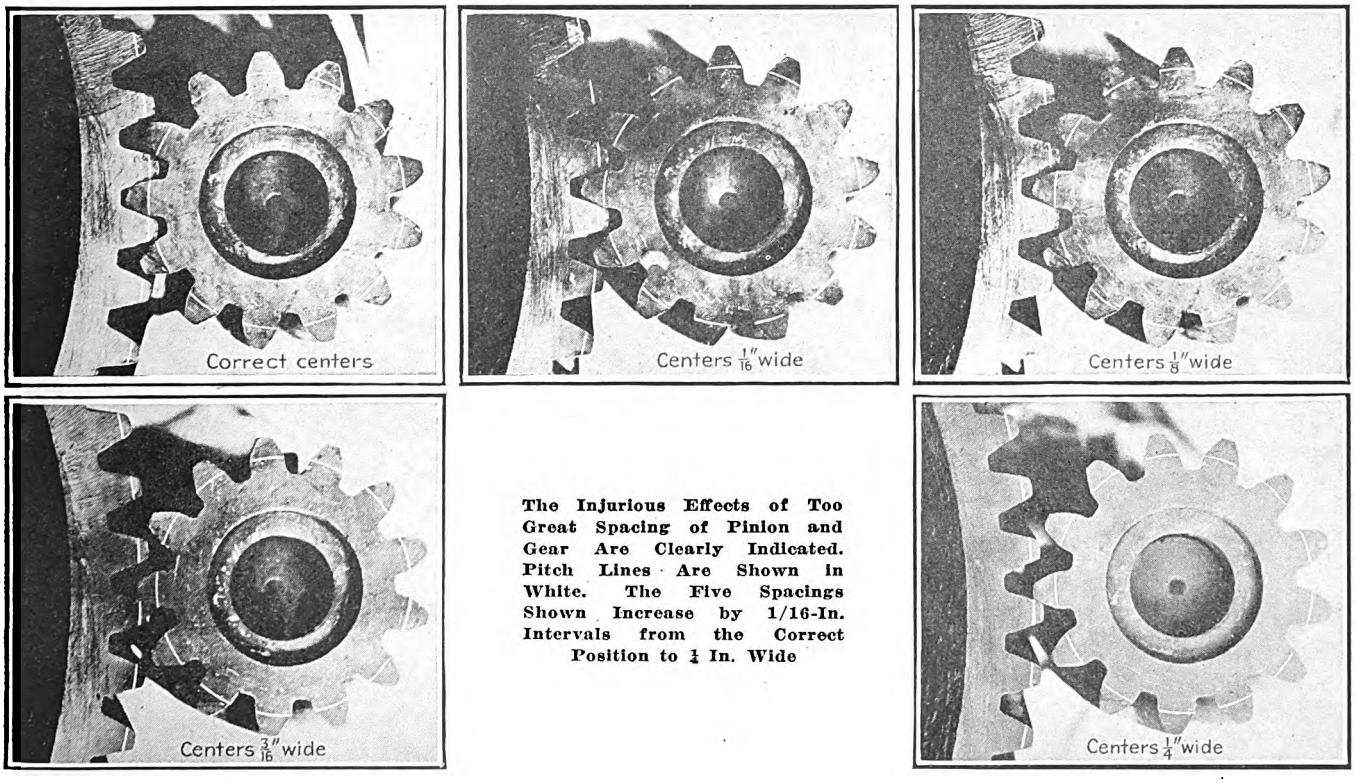
DURING the early days of electric railroading great efforts were made by motor manufacturers to design a motor whose armature could be mounted directly on the car axle. The purpose was to dispense with gearing, which in those days was a source of great expense as well as noise in car operation. These efforts to design a gearless motor have been given up, at least so far as car operation is concerned. It was found that the gearless motor has many serious objections, and as gear manufacturers have improved their product most of the defects experienced with the earlier gears and pinions have disappeared. If properly run and protected from damage, the modern gear and pinion should have a long life and give very little trouble. If their operation is not properly supervised, however, the life which they should have is greatly shortened, and they are responsible for a great deal of the noise which comes from car operation. In other ways, also, they will not give the maximum performance of which they are capable.

The principal trouble from gears of proper shape and material and properly lubricated comes from too great spacing between the gear and pinion. As the armature and motor axle bearings wear, the spacing between the pinion center and gear center tends to become greater. In consequence, the teeth of the gear and pinion, instead of touching at the pitch line, come in contact only at the outer ends of the teeth, with resulting greater wear and noise from the backlash.

The wear of the armature bearings and motor axle bearings which causes this spread of the gear and pinion can take place both in the bore of the bearing and on the outside of the bearing where it is held in the housing. Some wear is also possible on the inside of the motor housing, caused by a loose fit of the dowel pins or keys used to prevent the bearing from turning. There is also possible wear between the motor housing and the motor frame. It naturally follows that the distance of the spreading apart of gear and pinion is the sum of all the loose fits mentioned.

The bad condition brought about by too great spacing between gear and pinion is clearly illustrated in the accompanying five illustrations. They are from a series of photographs made by the R. D. Nuttall Company of a new railway gear and pinion set at different spacings. To bring out the injurious effect of improper spacing the Railway Improvement Company constructed a model, made up of a new gear and pinion mounted on a pedestal so designed that the space between the centers of the gear and the pinion could be set at various lengths by exact graduations of $\frac{1}{16}$ in. This model was shown at the Atlantic City convention. The gearing illustrated has a 13:74 ratio and a $4\frac{1}{4}$ pitch. The pitch line is shown by a white line marked on each tooth.

The first illustration shows the gear and pinion at the correct distance apart. In this position, as will be seen, the teeth engage at the pitch line. With this condition the white marks on the teeth of the gear and pinion in engagement make a practically continuous line.



The Injurious Effects of Too Great Spacing of Pinion and Gear Are Clearly Indicated. Pitch Lines Are Shown in White. The Five Spacings Shown Increase by 1/16-In. Intervals from the Correct Position to ¼ In. Wide

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The next view shows the centers of the gear and pinion 1/16 in. farther apart, and in the third view the centers are another 1/16 in. apart, or at a distance 1/8 in. greater than in the first view. Already the teeth are shown to be beginning to engage at their outer ends only. This condition is still more marked, of course, in the fourth and fifth views, which shows the centers 3/16 in. and 1/4 in. farther apart respectively than in the first view. The engravings are about one-half actual size. In consequence, the spacing between teeth and gear centers are correspondingly reduced in the engravings over that in actual practice.

It is obvious from the view of the 3/16-in. wide centers that the teeth are engaging on only a very small portion of their wearing surfaces, and that if operations under these conditions are continued for any considerable length of time the natural result would be for the teeth to lose their original shape. It is also clear that all of this wear is coming at the ends of the teeth and that only one tooth on the gear and one on the pinion are in contact for any considerable part of the time, whereas in the view of the correct spacing two sets of teeth are in engagement for most of the time.

A condition like that in a 3/16-in. wide spacing will not continue long until the teeth will begin to lose their proper shape and it will be necessary to discard them. There will also be a great increase in noise, especially as the car speed changes during a run, as there is a great deal of backlash to take up when a change in the speed of the car makes the change from engaging on the front of the teeth to engaging on the back of the teeth, or when the direction of rotation of the motor is changed. There is danger also, under such conditions, that the teeth of gear or pinion or both will become broken because of the great impact between teeth combined with a small area of bearing surface.

Clearly, the correct way of gear operation is when the gear and pinion mesh as shown in the first illustration. This condition should be approximated as closely as possible by keeping the tolerance allowed for the fit of the bearing on its shaft as small as possible. This condition can be maintained only by measurement of the wear in the bearings and associated parts at more or less frequent intervals, depending upon their wearing qualities and the quality of lubrication supplied to them. A slight increase in the distance between centers may not seriously affect the proper shape of the gear teeth, but it is doubtful whether the allowance of 1/16 in. permitted under the rules of the American Electric Railway Engineering Association is not too great. The London Underground Railway is said to work to 1/32 in. clearance.

Clearances between shafts and bearings should not only be kept very small, but constant attention should be given to keeping bearings tight in their housings and housings tight in motor frames. Omission of this precaution, as already stated, permits spreading of gear and pinion centers.

When new bearings are installed, the caps should be pulled up tight and steel feelers applied between the cap and the brass to see that the bearings actually are tight. Still another way of determining whether they are tight is to apply the air brake, then turn the controller to the first notch for a moment. If the brasses move they are not tight.

Present-day practice seems to be not to give as much attention to the axle bearings as to the armature bearings, so conditions at the axle bearing fits are more likely to be neglected. Nevertheless, axle bearings are subject to greater wear than armature bearings because there are no springs between the axle bearings and the track and the pounding they get is harder. Moreover, water from the street is much more likely to get into the axle bearings than into the armature bearings. Still another point, and one of great importance, is that in the axle bearings the openings or windows for waste usually are larger in proportion to the surface of the bearings than they are in the armature bearings. Here are a number of very good reasons for very careful watching of axle bearings in motor inspection.

The destructive results of too great a spread and loose brasses are so insidious that it would be desirable on any property where the conditions are not positively known to have a check made right away. Even where it is thought the conditions are good, a check test may be worth while. As an example of how much wear sometimes comes, measurements will be quoted of wear observed on four axle bearings recently taken from a 40-hp. motor used in city service. The following amounts of wear were found:

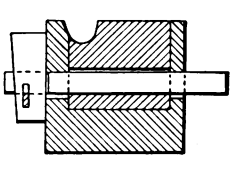
Flange Wear	Wear in Bore
One bearing, 1/2 in. wear	One bearing, 1/2 in. wear
One bearing, 1/4 in. wear	One bearing, 1/4 in. wear
One bearing, 1/8 in. wear	One bearing, 1/8 in. wear
One bearing, 1/16 in. wear	One bearing, 1/4 in. wear

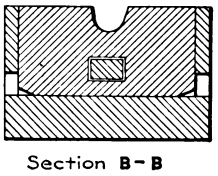
The figures given above are of wear only in the axle bearings. If to this wear is added that in the armature bearings and in the housings, the particular motor mentioned must have had considerable spread.

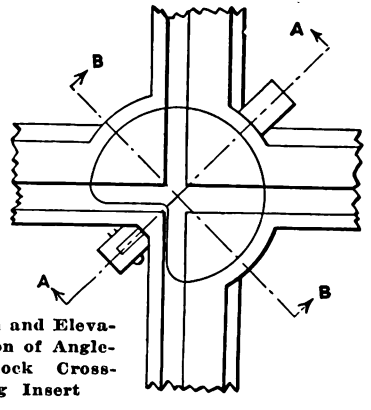
Crossing Insert Shaped to Hold Position

AN ANGLE-SHAPED hard center insert for crossing frogs has recently been designed by J. H. Asselin, engineering and construction department, Market Street Railway, San Francisco. A tapered key extending through the side walls of the casting and through the block itself holds it solidly in position. This key is held in place by a wedge through the end of the key.

The block itself resembles a cylinder, one-quarter of which has been removed. The angle thus formed







Plan and Elevation of Angle-Block Crossing Insert

fits into the inside angle of the intersection, where there is no wear. Due to this right angle, it is impossible for the block to shift. The alignment is thus kept true at all times and the block cannot rise or buckle.

The angle block has the thickness of approximately two-thirds of the depth of the casting. The block is cast-steel and specially heat-treated to resist shock. When worn down this block can either be built up by welding or the block itself can be removed. If desired, both the crossing and block can be made of manganese.

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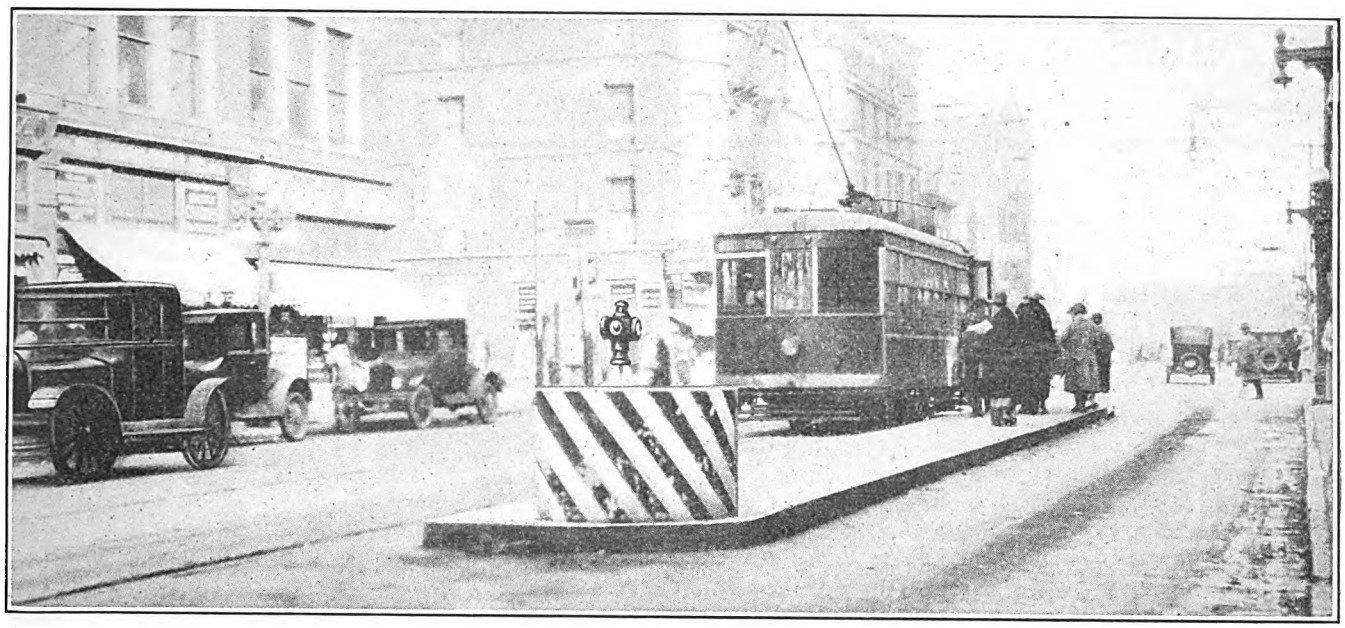


Safety Zone with Raised Platform Recently Installed in Terre Haute

Substantial Safety Zones Constructed in Terre Haute

Curved Concrete Guards Reinforced with Old Rails Afford Protection to Waiting Passengers—Cast-Iron Buttons Fastened to the Pavement Mark Limits of Zone

By D. H. Walker
Assistant Engineer Terre Haute, Indianapolis & Eastern Traction Company

During the past year the Terre Haute, Indianapolis & Eastern Traction Company constructed several cheap but effective safety zones on Wabash Avenue, the main street of Terre Haute, and part of the National Old Trails Highway. This national road carries a heavy stream of cross-country tourists all the year around. In addition, the majority of the large retail stores in the downtown district are on Wabash Avenue and the vehicular congestion made safety zones necessary to protect people boarding street cars.

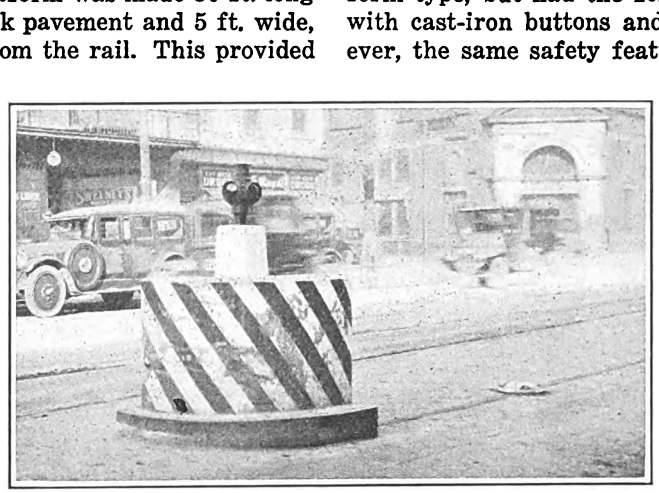
The first zone was installed as a raised platform at the corner of Wabash Avenue and Seventh Street, the busiest corner in town. As the street was 50 ft. wide between curbs there was approximately 18 ft. left from the rail to the curb. The platform was made 80 ft. long and 4 in. high above the brick pavement and 5 ft. wide, with its inside edge 18 in. from the rail. This provided enough length for unloading three Birney cars at once. A quarter circle concrete guard was placed at the end, and back of this guard was placed a concrete lamp base surmounted by an ordinary switch lamp with red lenses.

To prevent the guards at the ends of the zones being knocked over by a careless motorist, when the concrete was poured half a dozen old rails about 4 ft. long and extending down through the paving base were included for reinforcement. Guards were made 3 ft. high, 1 ft. thick, with a 3-ft. outside radius. In order to provide a hub guard the outside edge of the quarter circle was placed 6 in. inside the edge of the platform. The platform itself was poured directly on top of the brick paving, after taking out a zigzag row of bricks as a means of forming concrete lugs monolithic with the platform. A row of brick was removed at the inside edge of the platform toward the crown of the street to prevent seepage under the platform. To keep the concrete from chipping off an old three by three angle iron was used all the way around the edges and held by darts welded into the angle and extending diagonally down into the concrete.

It soon was found that the quarter circle guard prevented accidents that even the raised platform could not have stopped. Accompanying illustrations show a few of the dents put in the guards by careless or inebriated motorists. Several arrests of drunken drivers have resulted from these attacks upon the zones, but up to date no one waiting in the zones has been injured and the guards themselves have suffered nothing worse than the chipping off of a little concrete.

After a few weeks trial of this first zone it was decided to install three more. These were not of the platform type, but had the zone line marked on the street with cast-iron buttons and white painted lines. However, the same safety feature was provided by quarter circle concrete guards as used with the platform. These isolated guards also had the 6-in. hub guard with an angle iron forming the edge. This angle iron was extended the whole circumference and was welded at the corners to prevent loosening. Darts welded to the angle and extending into the concrete also helped hold this.

Bricks were removed under the whole guard and concrete poured to the paving base. Reinforcing



Reinforced Concrete Guard at End of Safety Zone—Cast-Iron Buttons and White Lines on Pavement Mark Limits

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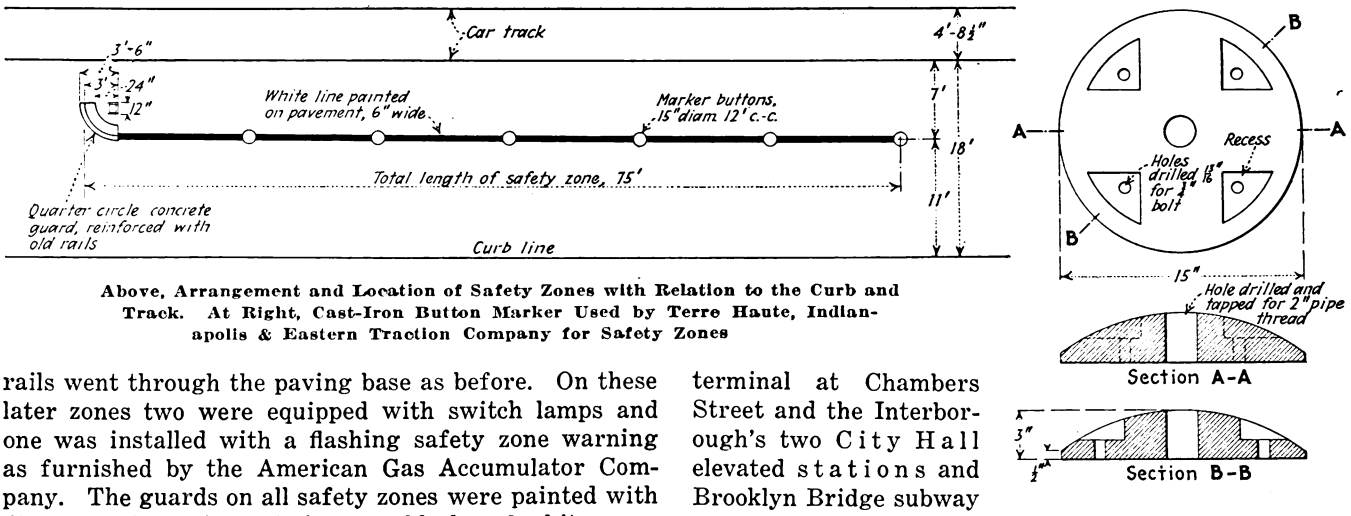

Above, Arrangement and Location of Safety Zones with Relation to the Curb and Track. At Right, Cast-Iron Button Marker Used by Terre Haute, Indianapolis & Eastern Traction Company for Safety Zones

rails went through the paving base as before. On these later zones two were equipped with switch lamps and one was installed with a flashing safety zone warning as furnished by the American Gas Accumulator Company. The guards on all safety zones were painted with diagonal 6-in. stripes of alternate black and white.

In the use of buttons to outline these zones it was necessary to design a special type and have a pattern and castings made to order. The Board of Works and the city engineer thought that posts connected by a chain would be necessary. They were willing to try first without the chains, however, if provision were made to install them in case it was deemed necessary later. The company felt that the chains were undesirable and accordingly used a button as shown by the accompanying sketch. This was fastened with four ¾-in. bolts on the corners in recessed notches. Holes were drilled in the paving for these bolts and they were set in cement grout. A hole through the center of the button was drilled and tapped for 2-in. pipe thread in order that posts could be placed in these holes later. While in use without posts the holes were filled by pipe plugs, a countersunk plug being used to minimize danger of tripping on the buttons. After a thorough trial it was found that the posts and chains were not necessary as the quarter circle guard furnished all the protection needed against motorists with inclinations to ramble through the zones.

New York City's Greatest Traffic Points

SUBWAY stations of the Interborough Rapid Transit Company and the New York Rapid Transit Corporation (B.-M. T.) at Times Square, Manhattan, remain the greatest traffic points upon their respective systems and constitute New York City's greatest rapid transit center. This is the conclusion drawn from the Transit Commission's annual compilation of figures of ticket sales at various stations upon the rapid transit lines made public recently.

During the fiscal year ended June 30, last, the Interborough collected 39,493,384 fares at Times Square, while the ticket collections at the B.-M. T. stations were 26,064,283, a total of 65,557,667 fares collected. as against 60,388,549 in 1924, a growth during the year of more than 5,000,000.

The figures show that Times Square as a rapid transit traffic center is further ahead of Brooklyn Bridge than last year. The center shifted two years ago. Last year Times Square increased to approximately 7,000,000 ahead of Brooklyn Bridge, and this year it is approximately 11,000,000 ahead. The total at Times Square includes the fare collections, as has been stated, at the Interborough and B.-M. T. stations, while at Brooklyn Bridge the total embraces fare collections for the Bridge station of the Brooklyn elevated lines, the B.-M. T. terminal at Chambers Street and the Interborough's two City Hall elevated stations and Brooklyn Bridge subway station. At the Brooklyn Bridge center there were 53,983,558 passengers in 1925, as against 53,885,798 in 1924, a growth for this center of only about 97,000.

Another great center of rapid transit traffic is at Union Square, Manhattan. There is one station of the Interborough at Union Square and two B.-M. T. stations, one of them on the Fourteenth Street-Eastern line, which was first placed in operation on June 30, 1924. The Interborough at Union Square had a traffic of 20,508,136, or an increase of approximately 900,000 over 1924. The B.-M. T. traffic was 19,690,245, or an increase of approximately 1,500,000. The total traffic for the center was 40,198,381, or a growth for the year of more than 2,350,000.

At Grand Central station, which is the station of second importance on the Interborough lines, 37,234,126 nickels were paid, as against 35,864,163 in 1924, a growth of 1,369,963, a rate of increase somewhat less than in the year previous. The Pennsylvania station, the third in importance in the Interborough system, with 32,073,801, had a growth of 1,922,771, or slightly less than the rate of increase in the previous year.

Figures for important Interborough stations follow:

	1925	1924
Times Square	39,493,384	37,594,661
Grand Central	37,234,126	35,864,163
Pennsylvania Station	32,073,801	30,151,030
Fourteenth Street (East Side line)	20,508,136	19,636,487
Atlantic Avenue (Brooklyn)	16,952,648	16,703,450
Brooklyn Bridge	15,714,454	15,673,611
Fulton Street (East Side line)	14,157,961	14,010,247
Borough Hall (Brooklyn)	13,414,219	13,640,702
Fourteenth Street (West Side line)	12,419,299	12,304,865
86th Street (East Side line)	11,406,290	11,267,689

On the Interborough subway system the local station of heaviest traffic, that is, a station served only by local trains, is that at 50th Street and Broadway, where there were collected in 1925 9,902,832 fares, or an increase of a little less than 300,000 fares for the year.

The most important traffic stations of the B.-M. T. subway and elevated lines are indicated as follows:

	1925	1924
Times Square	26,064,283	22,793,888
34th Street	21,853,851	19,163,092
Union Square	19,960,245	18,195,263
Coney Island terminals (Brooklyn)	16,825,685	14,932,523
Essex Street	15,815,237	14,200,520
Chambers Street (Municipal Building)	15,336,469	15,212,858
Cortlandt Street	13,891,455	12,626,451
Brooklyn Bridge ("L")	12,970,766	12,840,666
De Kalb Avenue (Brooklyn)	11,971,464	12,141,732
23d Street	10,807,254	10,064,998

It will be noted that Essex Street passed Chambers Street during the year and Cortlandt Street passed Brooklyn Bridge.

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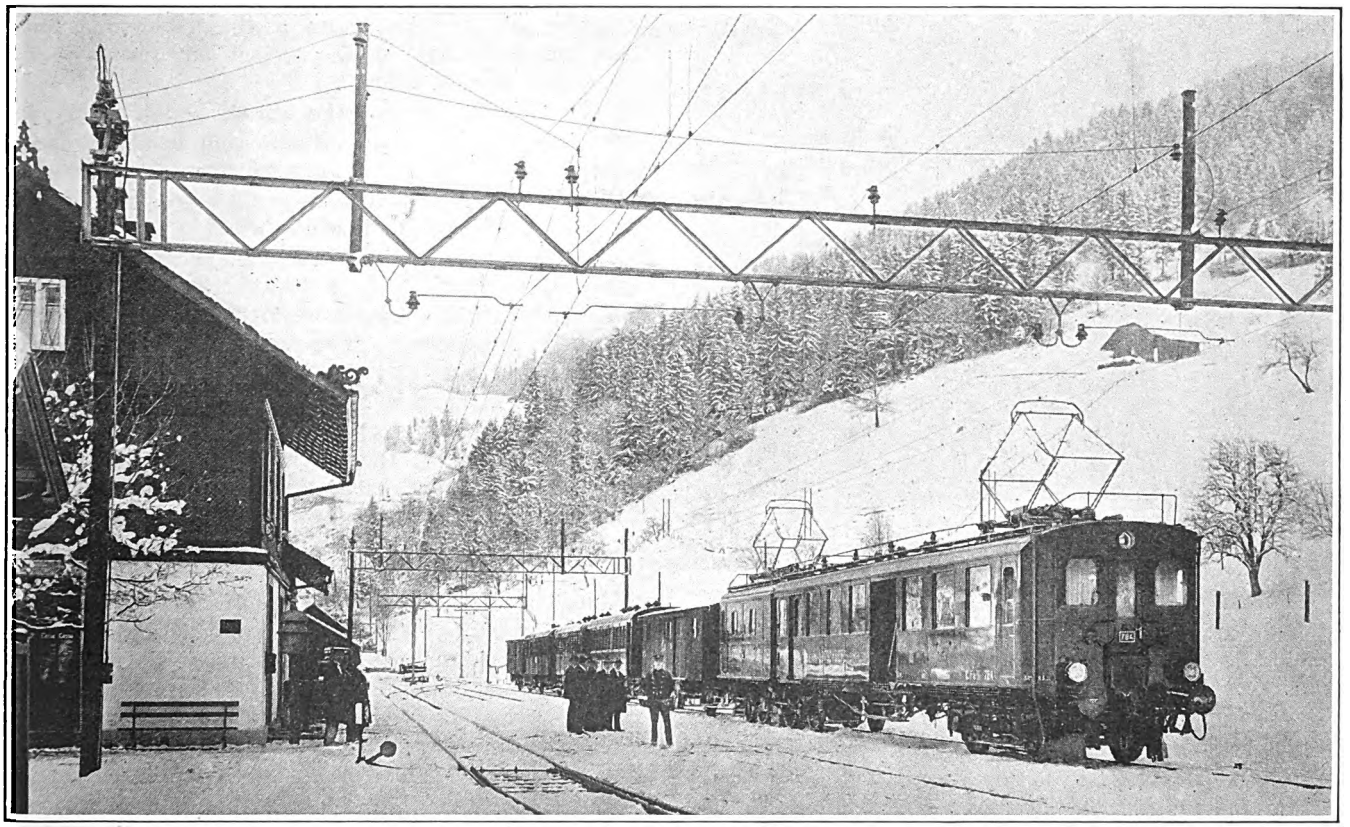
Combination Locomotive-Car Developed in Switzerland

Twelve-Wheel Vehicle Consists of a Six-Wheel Passenger Coach Permanently Coupled to a Six-Wheel Motive Power Unit—Unusual Safety Devices Are Provided



Combination Twelve-Wheel Locomotive-Car Used in Switzerland on Runs Where Traffic Does Not Justify Regular Train Operation

FOR service during slack periods when a long train is unnecessary, a combination locomotive and passenger coach is used by the Lötschberg Railway, which operates the section of the Swiss railways between Berne, Lötschberg and the Simplon. The new coaches are somewhat similar in design to those supplied by the Oerlikon Company in 1921 to the Burgdorf-Thun Railway. Electrical equipment is concentrated on a truck fitted with a leading axle and two driving axles, this truck being coupled to the main frame carrying the passenger and luggage compartments.

All the electrical equipment is in the locomotive portion. Current, single-phase 16⅔ period at 15,000 volts, is fed from the overhead collector device through isolating switches to the main current breaker, which is constructed for outdoor mounting. The circuit breaker is arranged for electro-pneumatic closing and for automatic electric release. A second pole of the circuit breaker is connected to the high-tension terminal of the transformer. The latter is of the oil-immersed, self-cooled type. In order to improve the cooling the transformer is inclosed in a second casing, into which air is drawn through the roof, passing over the transformer and escaping into the motor room.

The low-tension winding has eleven tappings which are connected to the motor as required for the various speeds, the highest voltage supplied to the motor being about 500. Connection between transformer tappings and motors is insured by means of twelve contactors that are controlled electro-pneumatically and are interlocked to prevent short circuits. They are arranged in the motor room. Passage from one notch to the next is insured without breaking the circuit in the usual way by means of a bridging coil.

Development of an hourly output of about 500 hp. at the wheel tires at a speed of 35 km. per hour (21.7 m.p.h.) was a requirement of the design. Another was that the motors should be as similar as possible to the spare motors kept on hand for the other electric engines of the company in order that they can be used in case of emergency. In view of this it was decided to adopt motors of the type supplied by the Oerlikon Company to the Bernese "Decree" railways that have been in successful use for a period of five years.

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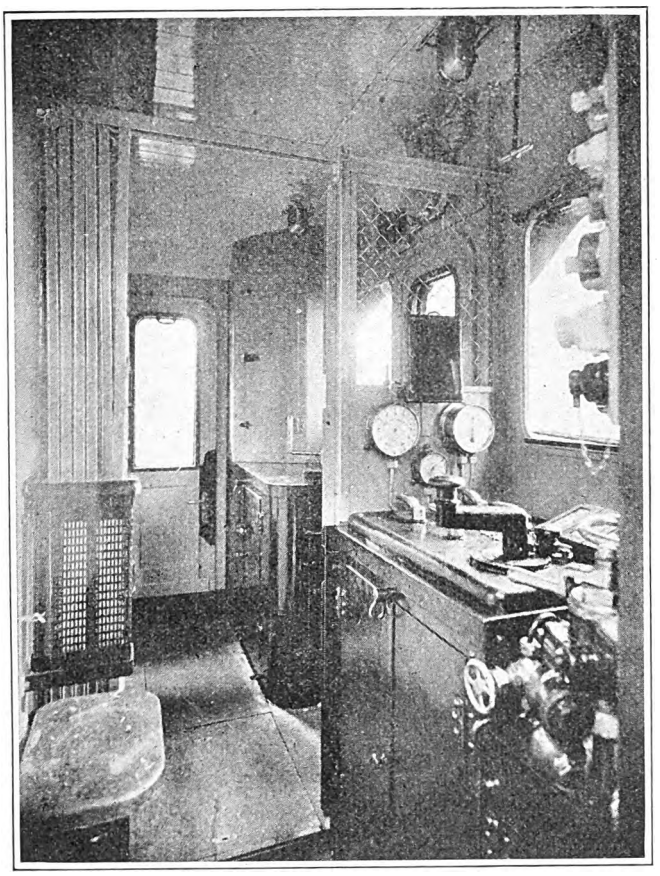


Motorman's Cab in Locomotive End of Combination Unit. Safety Devices Are Controlled by a Pedal and a Push Button

Each motor has ten poles, an actual one hour rating of 518 hp. at 21.7 m.p.h. and a continuous output of 425 hp. at 24.2 m.p.h. The highest speed is 40 m.p.h. The two driving axles are coupled together by means of a triangular system of rods and connected to the motor through a jackshaft. In this way it has been possible to use not only motors similar to those of the locomotives referred to but also the same gearing. Driving wheels are 4 ft. 4 in. in diameter, the gear ratio being 1 to 3.78. The controller is mounted on the motor frame, together with a fan set. The latter draws air from the motor room and drives it through the motor and out through the openings below. Multiple control and automatic acceleration are provided.

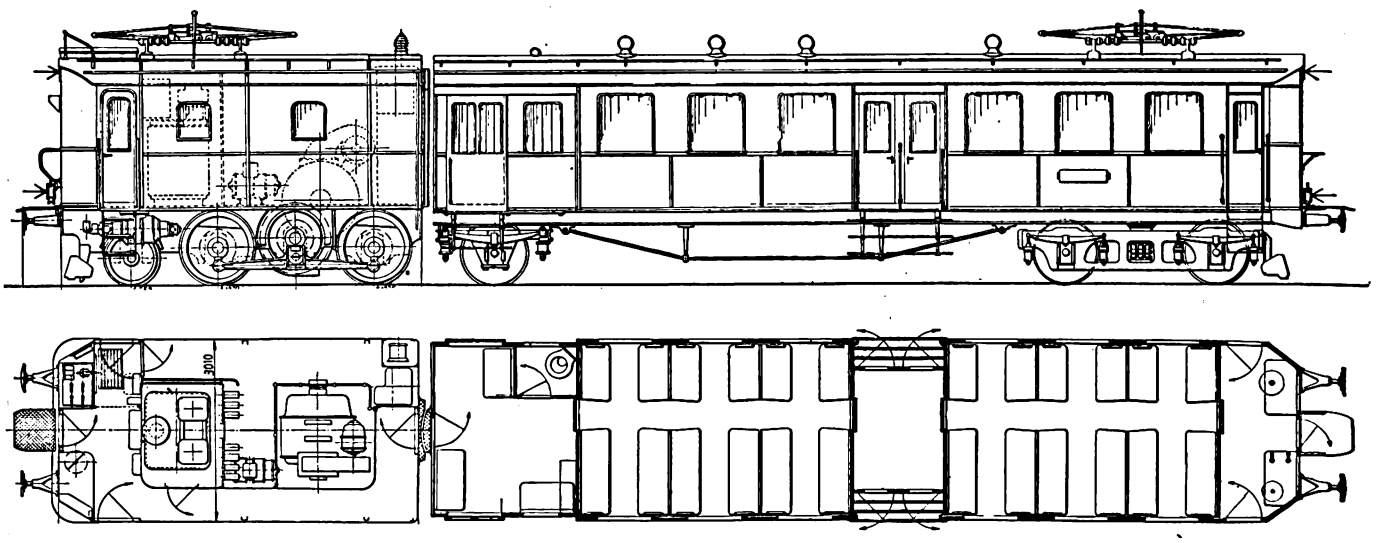
As they are intended for one-man operation, the cars have "dead man's" safety devices. Instead of having the safety device on the operating handle of the master controller, it is connected with a pedal which is depressed by the driver during the operation of the motor coach. When the pedal is released the motor circuit opens after a given interval, and the brake is brought into action by a relay. Within this interval, however, if the driver presses a push button mounted on the other side of the driver's cab, the switching off and braking is prevented. This arrangement was adopted to facilitate shunting operations, as the driver must under those circumstances be able to look out from one side of the cab or the other.

In order to permit of the vehicle being operated in either direction, the passenger coach is also provided with a driver's cab at the end away from the locomotive. Both the coach and the engine portion are provided with current-collecting apparatus.

Direct current at 36 volts for the control circuits and lighting is supplied by a 1-kw. motor-generator set and a battery of accumulators. Heating current for the different compartments of the coach is derived from the train heating bus lines. These are connected to a tapping of the transformer, giving 1,000 volts through an electro-pneumatically operated circuit breaker. The heating current for the driver's cab is obtained from the same supply system as the auxiliaries, such as the compressor set for the brake and the control gear. This supply system is connected to the 220-volt tapping of the transformer.

The coaches are each adapted to carry 60 passengers, although at times of heavy traffic five sitting and fifteen standing passengers can be accommodated in the luggage compartment. Over-all length of the engine proper is 21.6 ft. and of the complete vehicle 71 ft. 8 in. Total weight of the motor coach is 60.1 tons, of which the electrical equipment is responsible for 15.4 tons.

The vehicles were the joint production of three Swiss concerns, the Oerlikon Maschinenfabrik being responsible for the whole of the electrical equipment, the Swiss Locomotive & Machine Works, Winterthur, for the chassis and underwork, and the Swiss Industrial Company of Neuhausen for the body work.



Elevation and Floor Plan of Lötschberg Railway Locomotive-Coach. Seats for 60 Passengers Are Provided in the Main Compartment, with Fifteen Additional Seats in the Luggage Room

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When Should Pinions and Gears Be Removed for Tooth Wear

By E. S. Sawtelle
Assistant General Manager Tool Steel Gear & Pinion Company, Cincinnati, Ohio

Gages Can Be Used Successfully on a Large Majority of Present-Day Gears and Pinions to Determine When Teeth Are Worn Out —A Few Abnormal Cases May Require Special Consideration

PRESENT practice of leaving to the judgment of inspectors the decision as to when a gear or pinion should be removed as having finished its useful life is unsatisfactory. Most superintendents of equipment and master mechanics would welcome some sort of a gage to decide when gears and pinions should be scrapped, but they seem to feel that the variety of tooth shapes and differences in gear ratios offer obstacles that prevent the use of a satisfactory gage. A study of the subject, however, shows that gages can be used successfully on the great majority of gears and pinions to determine when they should be removed. An occasional gear or pinion may wear abnormally, due to misalignment, bad bearings or some other condition. In such cases the tooth may be very badly worn at the top and thoroughly fit for rejection, though it may not show much wear at the gage point. Judgment must be used in connection with the gages to safeguard against a condition of this kind.

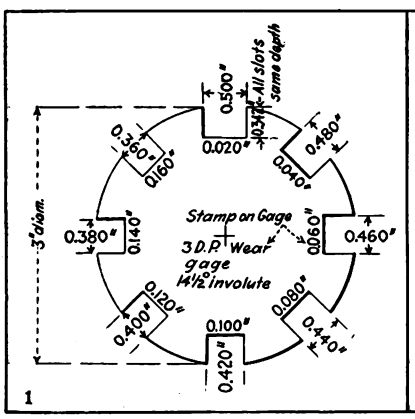
In order to illustrate the problems that are encountered in gaging gear teeth for wear, and also as a suggestion for types of gages that appear to be satisfactory for determining when gears or pinions should be scrapped, I have outlined in the accompanying diagrams several gages that should be of assistance to inspectors.

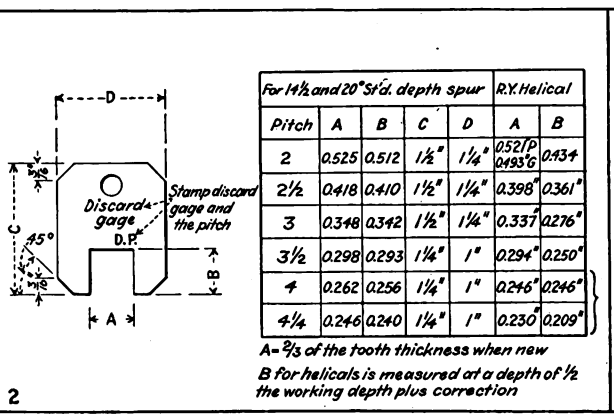
Where the standard Brown & Sharpe 14½-deg. gear or pinion is used wear at the pitch line can be determined by a simple snap gage which measures the wear from the top of the tooth to the pitch line. Fig. 1 shows such a gage, which can be read quickly and should be useful. This can be applied to any type of three-pitch pinion. The slots of this gage are all of the same depth and are equal to the corrected addendum for the pitch, but the width of each slot in the gage is varied so as to measure all the way from a new tooth to one worn out by progressive steps of 0.020 in. This gage should prove very handy for determining approximately how near worn out a pinion may be.

A discard gage is shown in Fig. 2, which can be used readily on a Brown & Sharpe 14½-deg. tooth for measuring a worn-out gear or pinion. The dimension *A* for the thickness of the tooth is usually taken as two-thirds of the original thickness at the pitch line of a new gear or pinion.

For a diametrical pitch of three this would be two-thirds of 0.523, or 0.348 in. The dimension *B* for the depth is the corrected addendum, which for a three-pitch pinion of about 14 to 17 teeth should be 0.345 in. This corrected addendum varies slightly with the number of teeth, but a gage for a depth of 0.345 in. can be used for any gear or pinion with a negligible error.

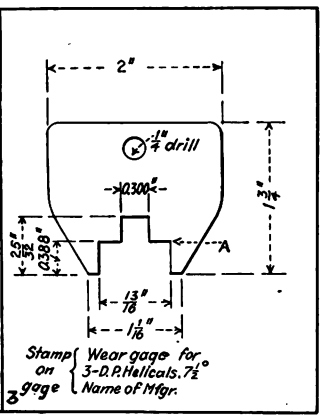
Several of the more modern tooth shapes depart from the Brown & Sharpe standard and have higher pressure angles. These include the long and short addendum tooth, the helical tooth and the wisdom tooth pinion. Originally these teeth are cut broader at the base and narrower at the top, with the result that frequently they may wear to a knife edge at the top before they are sufficiently worn at the center of the tooth to warrant discarding. Such a condition is shown in Fig. 4, to-





For 14½ and 20° Std. depth spur					R.Y. Helical	
Pitch	A	B	C	D	A	B
2	0.525	0.512	1½"	1¼"	0.521 P 0.493 G	0.434
2½	0.418	0.410	1½"	1¼"	0.398"	0.361"
3	0.348	0.342	1½"	1¼"	0.337"	0.276"
3½	0.298	0.293	1¼"	1"	0.294"	0.250"
4	0.262	0.256	1¼"	1"	0.246"	0.246"
4¼	0.246	0.240	1¼"	1"	0.230"	0.209"

A = ⅔ of the tooth thickness when new
B for helicals is measured at a depth of ½ the working depth plus correction



Note: all gages of 3/16" cold rolled steel, case hardened.

Note: For helical pinions 4 D.P. and 4¼ D.P. use gage C-144

Fig. 1—Wear Gage for Three-Diametrical Pitch Gearing. This Provides for Gaging Wear Every 0.020 In.

Fig. 2—Discard Gage for Brown & Sharpe 14½-Deg. Teeth to Measure Worn Condition

Fig. 3—Discard Gage for Gearing with Long and Short Addendum Teeth, Helical Teeth and the Wisdom Tooth Pinion

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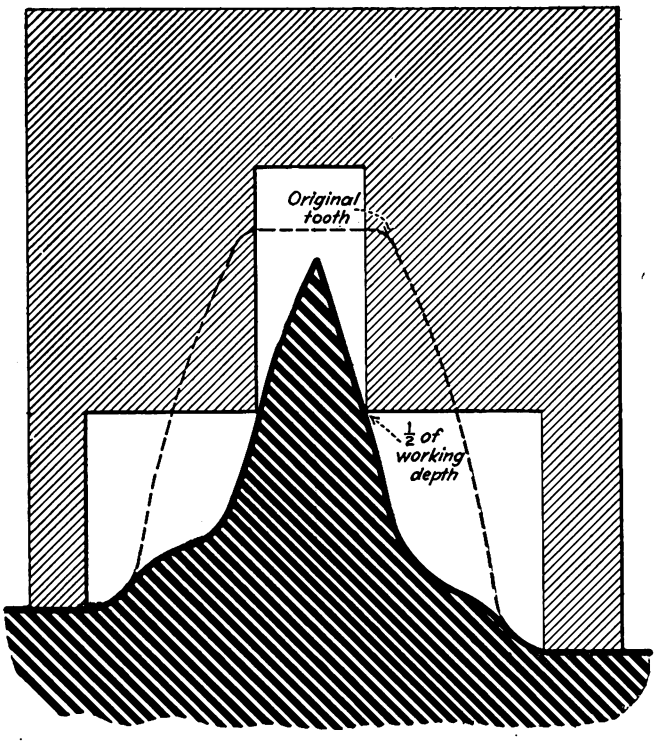

Fig. 4—Gearing with High-Pressure Angles Frequently Can Be Worn to a Knife Edge at the Top Before It Is Sufficiently Worn at the Center to Warrant Discarding

gether with an outline of the general type of gage that could be used to meet this condition. The gages shown in Figs. 1 and 2 cannot be used safely after the gear or pinion is worn to a knife edge. For such conditions a type of gage shown in Fig. 3 is recommended. This takes its height bearing from the root of the tooth. In this gage the offset at *A* is half way down the working depth of the tooth, and the thickness measured at this point is that at which the gear or pinion should be rejected. This is recommended to be two-thirds of its original thickness at point *A*. The vertical legs of the gage are of such length as to make the gage point *A* bear at the center of the working depth. The inside slot of the gage is such as to provide a clearance over the top of the tooth. This gage cannot be made universal, but a separate gage must be made for the gear and for each pinion with a different number of teeth. Likewise, an exact formula cannot be offered since there are variations used in the height and depth of the teeth for various types of gearing. The simplest method of getting dimensions for such a gear is to obtain exact data from gear manufacturers for the specific type of gearing used and make up a gage to suit individual ideas as to the degree of wear permissible before rejection.

During 1925 the number of accidents on the lines of the International Railway, Buffalo, N. Y., decreased 7.2 per cent. Serious accidents fell off even more, as shown by the fact that 10.28 per cent fewer persons were injured. During the *Courier* campaign against safety zone violators, I. R. C. employees turned in to the police 1,044 reports covering 1,235 violations of the ordinance establishing a 7-ft. safety zone around standing street cars. The campaign has greatly lowered the risk of accident to pedestrians and to passengers. A flashing signal was installed at Union Road on the Lancaster line and a new improved block signal system on the Buffalo-Niagara Falls High Speed line.

The Readers' Forum

Noise Reduction Should Pay Well

WISCONSIN VALLEY ELECTRIC COMPANY
WAUSAU, WIS., Feb. 9, 1926.

To the Editor:

Several very inspiring articles have appeared in the ELECTRIC RAILWAY JOURNAL of late, and no doubt they have been read with a great deal of interest by many men in the industry who are constantly trying to improve service in their different localities.

The reply to "Master Mechanic" by the chairman of the noise reduction committee is very appropriate indeed, and I believe this committee deserves the support of the entire industry and should be encouraged rather than discouraged. There will, of course, always be with us the man who is ready to throw cold water on any proposition, but fortunately those men are in the minority, and the committee should know this.

It is very gratifying to read the letter by Clinton D. Smith, who certainly takes a very optimistic view about the future of our industry, and we must agree that he is right when he states that the car is our show window and it is through the pleasing appearance as well as comfortable, speedy and safe transportation that we will get our message across to the public, and that only in this way can we expect to get patrons enough to make our industry profitable. "Master Mechanic" wonders where the money to improve equipment is to come from. It is by the improvement of equipment and track that patronage is going to be increased, but occasionally we find some executive who thinks he must either curtail service or cut down the appropriation for maintenance of equipment as soon as the seasonal drop in patronage occurs.

Such men are losing track of the fact that we are at a dawn of a new era in transportation. The standard of living in our country, we are told, is constantly ascending to higher levels. If that is so it holds true equally well in transportation. We cannot expect that people are going to ride in dirty, dilapidated cars, many of which are equipped with hard slat seats. Instead we must be up to date and offer them an attractive ride, on full spring cushions, in cars which are clean and attractive, not necessarily luxurious. The bus properly co-ordinated with railway service should provide our service de luxe at proportionately higher rates than we are now getting for electric car service.

A word in regard to noise. Our old, heavy equipment was very noisy. It was also clumsy and was not economical to operate. We found that we could operate cars of lighter weight with quite a saving, but most of us went to extremes in lightness. Certainly the safety car has not proved less noisy than the old heavy equipment previously operated.

Within the last few years the car builders have brought out cars which they believe—and I think they are right—would strike a medium between the old heavy equipment and the too light safety car. This medium-weight double-truck car has met with favor among the operators as well as the riding public. It has a much more pleasing appearance, is more comfortable and speedier. Certainly the noise is considerably reduced and the cost of operation less.

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The reduction of noise can be extended to the track structure as well as to the rolling stock. The more resilient the track structure the less noise will be noticed, and I believe that in all future trackwork, either new or reconstruction, serious consideration should be given to materials now on the market which have been proved to make the track resilient, and without movement enough to disturb pavement in the track area. On test track in different localities resilient construction has proved very popular.

The Wisconsin Utilities Association has a railway fellowship at the University of Wisconsin. The young man who is taking the course this year was given as his subject to study, "The reduction of noises in equipment." A committee of three operating men was appointed to confer with this young student and to guide him. He is free to call on any of the operators at any time for information which will help him in his work, and I have no doubt that when he makes his report next summer it will be of great benefit not only to us here in Wisconsin but to the entire industry.

I feel that the industry ought to get behind the committee on noise reduction and give it the support it so well deserves.

I have just read the address delivered by Mr. Budd at Indianapolis, and if all utility operators would look at the future as brightly as Mr. Budd does there would be no cause for worry, as every man would then be up and doing all the time.

NELS C. RASMUSSEN,
Superintendent of Railways and Chairman Railway Section Wisconsin Utilities Association.

Additional Information Concerning Number of Employees in Seattle

SEATTLE, WASH., Feb. 5, 1926.

To the Editor:

After reading the editorial in the Dec. 12, 1925, issue of ELECTRIC RAILWAY JOURNAL entitled "Cold Comfort for Municipal Ownership Advocates in Seattle Experience," I wish to call your attention to certain features of the situation not mentioned in that article. Acquisition of the street railway lines by the city occurred in April, 1919. Prior to this acquisition the total number of street railway employees was 1,876.

EMPLOYEES IN SERVICE OF SEATTLE MUNICIPAL STREET RAILWAY

	April 1, 1919*	April 1, 1920	Dec. 1 1925
Transportation:			
Dispatchers, schedule clerks, inspectors, starters, and station masters	39	44	30
Office	15	36	17
Trainmen	1,289	1,439	1,220
Shops and carhouses	325	461	287
Way and structures	169	234	285
Accounting	39	40	36
Accounting, stores department	†	26	16
	1,876	2,280	1,891

* Figures under April, 1919, include employees of the traction company and city employees engaged in operation of a municipal car line.

† The number of employees in the storeroom of the accounting department of the traction company not known at this time.

This figure includes those engaged in the operation of a municipal car line. Between April 1, 1919, and April 1, 1920, the number rose to 2,280. On March 22, 1920, a reorganization occurred which created a railway division of the public utility department. When this reorganization was completed and put into effect the services of 236 employees were disposed of. Due to further economies and reductions since that time, we had in our employ on Dec. 1, 1925, only 1,891. During the time that this reorganization has been in effect we established the basic eight-hour day. We allow the trainmen one day off in eight on their own time and have increased the number of car-hours on account of the installation of bus service in different sections. At this time 55 per cent of our operation is one-man. When the city took over the line from the traction company there was only a very small percentage of one-man operation. A tabulation of the number of employees at different dates is given in the opposite column.

There is considerable discrepancy between these figures and those which you quoted in your editorial from one of the Seattle newspapers. I thought you would be interested to know of this difference and to publish a correction.

D. W. HENDERSON,
General Superintendent.

Payroll Time Not Running Time

Feb. 15, 1926.

To the Editor:

In your issue of Jan. 30, page 195, there is a letter to the editor headed "Buses Faster than Electric Cars in New York." The writer bases his conclusions on a comparison of vehicle-miles and vehicle-hours, including layovers and delays. This is an error which is often accepted from statistical data and yet it is no true showing of the speed of a company's cars. Actual speed is determined by the average running time between terminals, excluding layover time and all other payroll time such as that allowed for reporting, turning in, meal relief, making out reports, etc. I do not know if the New York figures would show if it were possible to exclude these items from the New York Transit Commission reports showing car-hours, which generally mean payroll hours. I might mention in this connection that on certain properties the excess time is considerable, going to as much as 20 per cent over and above that spent in operating cars between terminals.

FAIR PLAY.

Credit Union Organized in Atlanta

GEORGIA already has one credit union, the Public Service Credit Union, which recently began operations under the auspices of the Georgia Railway & Power Company in Atlanta. A charter was secured by this union and organization was effected on Jan. 12, with an initial membership of 30, a stock subscription of 137 shares, at $5 a share, and excellent prospects for work among the 5,300 employees of the company.

The entrance fee has been placed at 25 cents and a member can start in it by taking out a single share. No member can hold more than 100 shares of stock, and no member can have more than $500 in stock or cash on deposit.

Two kinds of loans are made—a "character" loan and an "indorsed" loan. The character loan may run as high as $50 and is made, in the judgment of the credit committee, on the character of the applicant. This provides for emergency cases when an employee needs money quickly and cannot offer security for it. The indorsed loan may run to as high as $250, but must bear the indorsement of other members of the organization or some responsible person. These two types are expected to take care of the loan end.

A special feature will be the savings bank, which will lend out money at 6 per cent and pay 4 per cent for deposits, the difference of 2 per cent going to take care of the expenses of operation.

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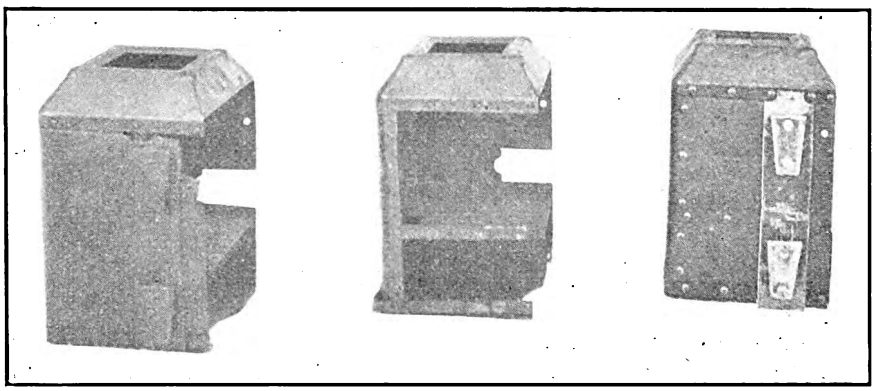
Equipment Maintenance Notes

Strengthening Fare Boxes During Repairs

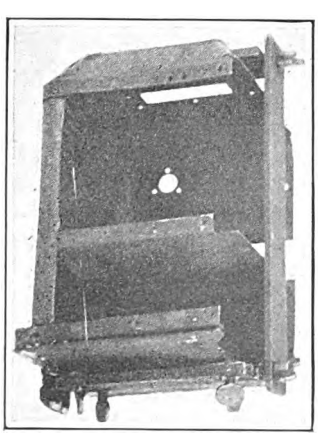
PASSENGERS alighting from electric cars frequently find the fare box a convenient place to hang onto for support until the car stops. As a result the supporting side of the fare box is frequently subjected to severe strains. The Eighth Avenue Railroad, New York City, has had a considerable number of breakages of the metal on the supporting side of Johnson fare boxes along the top edge. In repairing these, C. P. Westlake, supervisor of equipment, has arranged a strengthening plate of steel 5¾ in. x 4 in. x ⅛ in., which he installs and rivets inside to strengthen the point where failures occur. In order to provide a satisfactory and economical job several fixtures and jigs are used for the drilling and riveting operations in doing the work.

One of the accompanying illustrations shows the casing of three Johnson fare boxes; the one at the left in the illustration is a box before any repairs are made. This shows the breaking away of the metal at the top right hand corner. In repairing these boxes the first operation is to cut away the supporting side as shown in the center one of the fare boxes. The fare box at the right shows the finished job after repairs and reinforcement have been made. In order to hold the box in position after the side has been removed while work of drilling and riveting is being done a clamp is placed around the box. A second illustration shows this clamp in position. It has a number of thumbscrews for adjustment and tightening. Another illustration shows the fixtures used for doing the work. In this view the jig at the left is for drilling the new side plates which are installed.

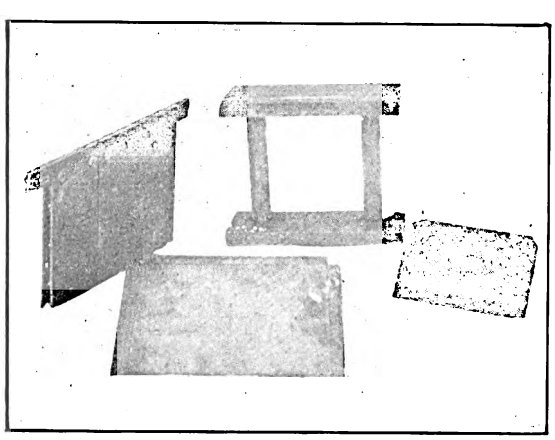


Fare Boxes Before and After Repairs Have Been Made
At left, casing with broken supporting side. In center, the supporting side has been cut away while making repairs. At right, completed casing after repairs have been made.

One of these plates is shown in the foreground of the illustration. The jig is made with two sides and the plate to be drilled is slipped between these and held firmly in position during the drilling operation. The reinforcing plate is shown at the extreme right in this illustration and a fixture for riveting in the background. This fixture is placed inside the box and, with the clamp shown in another illustration, makes firm support so that the riveting can be done satisfactorily. By this method of strengthening the supporting side of boxes during repairs the number of boxes which require work to be done for breaking away of the supporting side has been reduced considerably.



Clamp Used to Hold Fare Box in Position for Drilling and Riveting



Jigs and Fixtures for Repairing Fare Boxes
At left, jig for drilling supporting side plates; in foreground, side plate before being drilled. At right, reinforcing plate; in background, fixture for riveting.

Hinged Apron Permits Easy Repairs to Cars

IMPROVED appearance of cars is one of the important factors in the campaign of modernization with which electric railway operators are bringing back the business that is logically theirs. The smart street car today is wearing an apron. The old-fashioned car set high over the trucks and displaying a confusing array of wheels, brake rods, motors, air compressors, etc., is quite out of harmony with the streamline designs and complete inclosures of the modern automobiles and buses which crowd the cars on every highway. Along with steps to make electric railway equipment more comfortable and less noisy, the elimination of this objectionable appearance of cars is being given careful consideration on a maintenance basis.

A simple method of accomplishing this purpose even on old cars is the apron in use by the Grand Rapids Railway, as illustrated herewith. William Goldner, master mechanic, reports that the original aprons were put on solid all the way around, which was not satisfactory due to the fact that it was almost impossible to get to the trucks for oiling, repair work, etc., without removing the apron, a defect which

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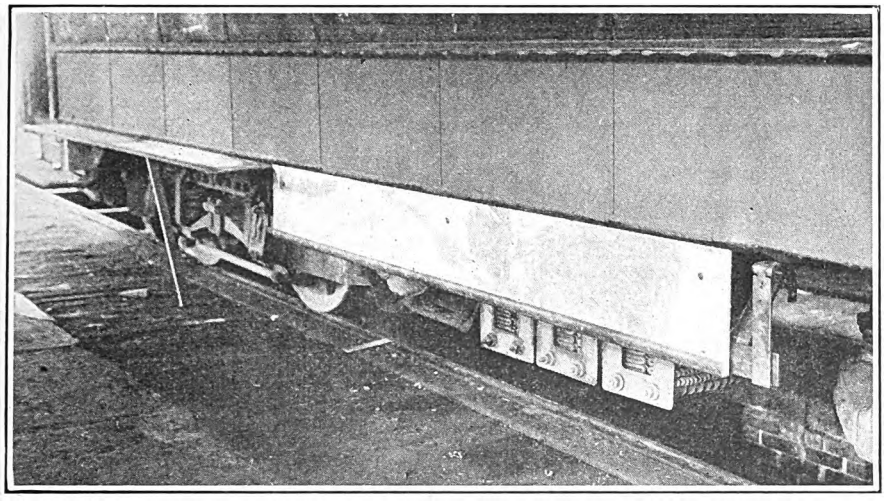


Metal Moldings at Top and Bottom of Hinged Aprons Give Finished Appearance and Add Streamline Effect

he expects to remedy by putting the apron on hinges, as shown, which is the first apron built in that manner. This apron is ⅜-in. Plymetl, faced with steel on both sides. This provides great resistance to breakage or puncture with minimum weight. It is easily made and simple to maintain. Mr. Goldner says in the future he would prefer and specify ¼-in. Plymetl.

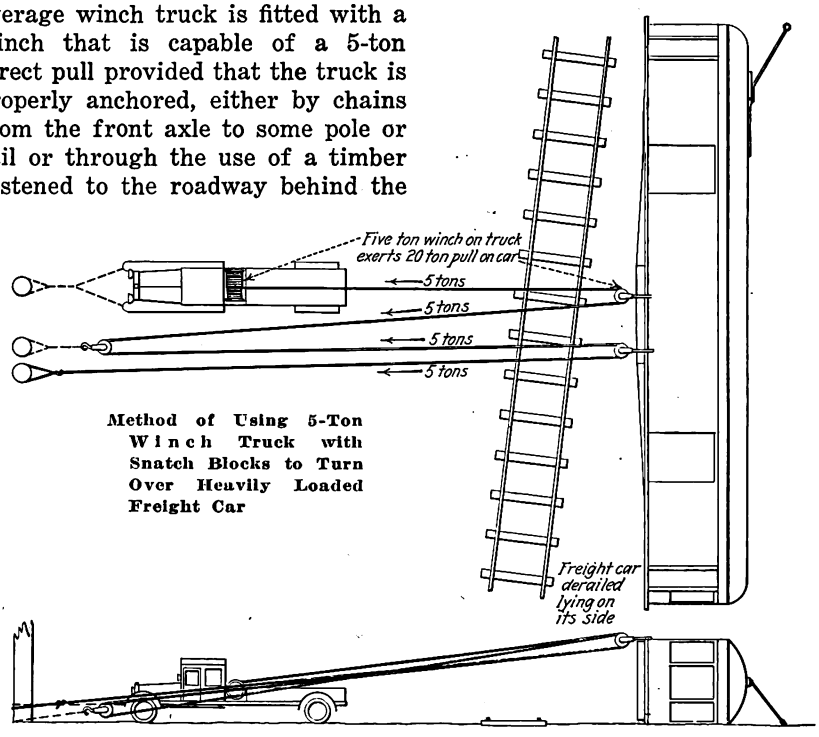
The apron shown is also the first one made with the metal molding running along the bottom. The top molding is screwed to the car proper so that when the apron is hanging down in place it has the appearance of having the molding all the way around, whereas the molding is fastened only to the bottom portion of the apron, while the top edge of the apron will be perfected by one metal face being broken over the edge.

Five-Ton Winch Truck Clears Freight Wreck

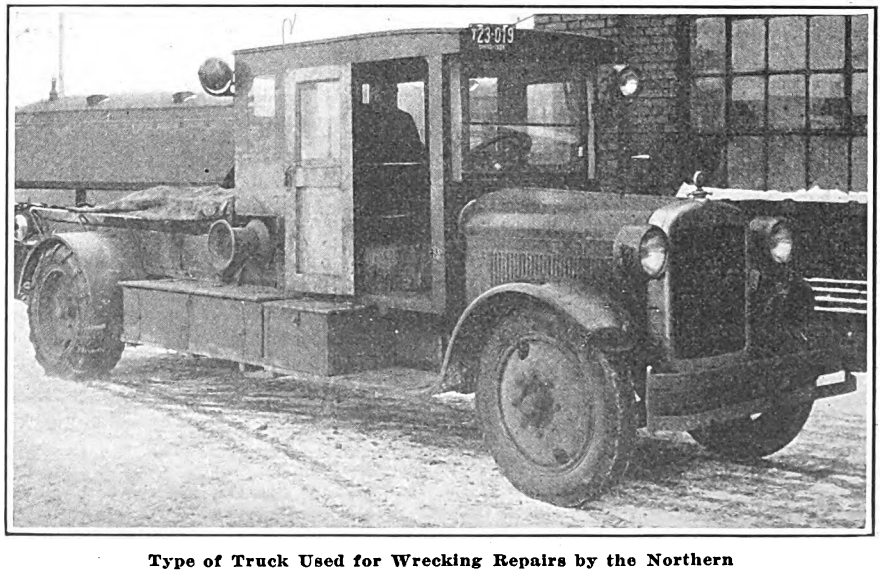
BY PIERRE V. C. SEE
Superintendent of Equipment Northern Ohio Traction & Light Company, Akron, Ohio

MOST city properties realize the possibilities of using trucks for street car wrecking. Their ability to get to the point of trouble in a minimum of time provides a speedy method for rerailing cars and clearing minor wrecks. It seems, however, that few properties realize the great possibilities offered to use the winch-type truck and a snatch-block combination for clearing up large interurban and freight car wrecks. The track and line departments of most electric railway properties are provided with winch trucks, which are available in case of emergency. Where the railway itself is not provided with such trucks it can usually secure the use of them from large auto towing concerns. The average winch truck is fitted with a winch that is capable of a 5-ton direct pull provided that the truck is properly anchored, either by chains from the front axle to some pole or rail or through the use of a timber fastened to the roadway behind the truck. A 5-ton direct pull will haul the car or truck back to the track and rerail it, and if the car is in a ditch or turned over the power furnished can be multiplied by attaching additional lines with snatch blocks. Each line adds an additional 5-ton pull.

The accompanying sketch shows how a 5-ton truck was used to turn over a 43-ft., 40-ton freight trailer which was laying flat on its side. In this particular case it was impossible to get a line under the car so as to provide a rolling hitch. Had this been possible the matter of turning the car over would have been simplified somewhat. As it was, the line was connected to the highest point on the bottom of the underframe. This was at the end of the bolster



Method of Using 5-Ton Winch Truck with Snatch Blocks to Turn Over Heavily Loaded Freight Car



Type of Truck Used for Wrecking Repairs by the Northern Ohio Traction & Light Company

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and top of the needle beam. By using four lines as shown in the sketch, it was a very simple matter to turn this heavily-loaded freight car over to an upright position with one pull.

The winch truck that was used on this job is shown in another illustration. It has a six-cylinder chassis with 36x6 pneumatic tires, duals in the rear. A large cab is provided so that seven men can be seated very comfortably inside, while the open body is used for carrying jacks, blocks and other wrecking material. This particular truck is capable of making a speed of 40 m.p.h. and makes nearly as good time as can be made with a touring car in getting to a wreck promptly. In the particular case mentioned the wreck was more than 40 miles from the shop, so this speed was of decided advantage in clearing the tracks promptly.

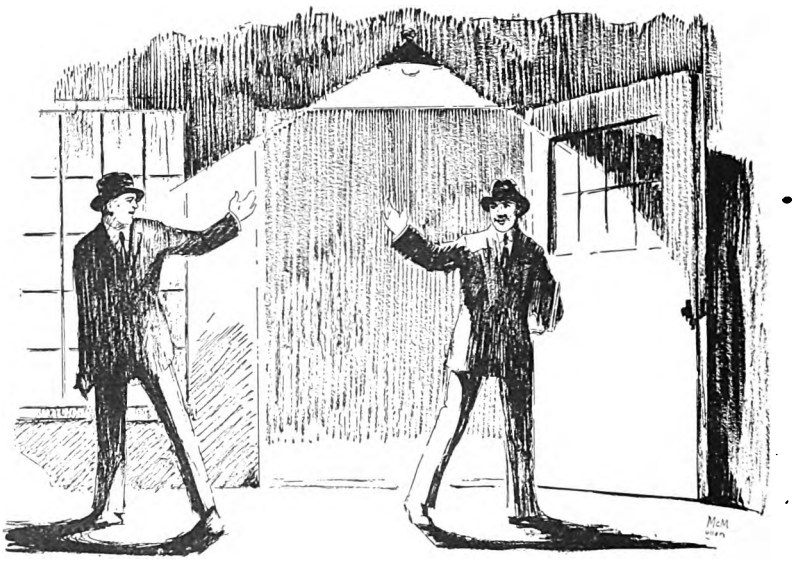
Bolted Anchor Plate Used to Hold Trolley Wire

UNTIL recently the Union Street Railway, New Bedford, Mass., experienced some difficulty with the type of anchor plate used to hold trolley wire. It had been the practice to solder the usual eyebolt clamp to the trolley wire and then attach the anchor wire to the clamp. It was found, however, that the heat from soldering had made a weak place in the trolley wire. It was also noted that the soldered surface of the clamp was so small that the trolley wire bent very easily when any extra pressure was brought to bear on the anchor wire. These defects frequently caused a breaking of the trolley wire.

To overcome these difficulties, Peter Dupuis, line foreman, designed a type of anchor plate that has proved very satisfactory. A piece of ⅛-in. machine steel plate, 8 in. long and 5 in. wide, was bent V-shaped. This plate was held together at the top by three 1½-in. x ⅜-in. machine bolts. Below these bolts is an 8-in. piece of ½-in. square machine steel, through which four 1½-in. x ⅝-in. setscrews are passed. The bottoms of these setscrews bear on an 8-in. piece of ⅝-in. square machine steel. When the anchor plate is in use this piece of steel rests on the trolley wire. By tightening the setscrews the ⅝-in. steel rod presses the trolley wire against the bottom of the V-shaped plate, while the ½-in. steel

Dick Encounters Difficulties

And Discusses Maintenance Cost Records



IT WAS far into the night when Dick Prescott, engineer of equipment of the Consolidated Railway & Light Company, and Steve White, carpenter foreman, decided to call it a day and go home. They had struggled long and wearily in the endeavor to arrive at a method of estimating the excessive maintenance cost on some of the antiquated equipment operated on their property.

"There are so many factors involved in this darn thing," said Dick, when they finally began to pack up thir papers, that it's almost a guess to try to get any comparision from the meager records that we've got available."

Dick picked up the pad on which they had been working. "It would be simple if the accounts were divided for different groups of cars," he remarked as he cast his eye down the row of items they had listed. "In addition to the costs," he continued, "I would also like to see pull-ins classified by car types. Gee! I'll bet that would tell a story that would soon show our practice up in a new light."

"I can remember one case," said Steve, "where we got to looking into the number of rewinds on one particular type of armature, and everybody was surprised to learn that the darn things were being rewound more than an average of once every year. No one knew how long that had been going on, until we happened to stumble onto it. If the accounts had been set up in the right way, the cost of maintenance on that type of motor would have stood out like a sore thumb."

"Well, all this is fine for the future, but we haven't got very far in estimating the costs for some of the equipment we now have in service."

"We can't get very far with that," replied Steve. "I've been digging up all the figures I can get hold of, but they don't give much. I do think, though, that I can get some estimates together now for the old 200 series cars that we're overhauling and the new 1200s."

"How are you going to get at it?" queried Dick.

"Well, I know about what we're spending on the bodies. I can get a fair estimate of the truck job from Bill Johnson, the truck shop foreman. Then, you see, Mike over at Center barn has all the 200s and some of the 1200s. I think he keeps some records of his own that may help us out. We've got power meters on both these groups of cars, and it won't be much of a trick to find out how much the power saving on the new cars amounts to. I also think Mike can check up his pull-ins and tell us how they compare on the old and the new cars. That's about as far as we can go."

"Even if that's all we can get together, I think it's worth talking over with the old man. He's working on the budget for next year and he could use that estimate for putting in a recommendation that we buy a group of new cars to replace the 200s and stop this heavy rebuilding program on them. Gee, I'll bet the money we're spending right there would more than pay the interest on new cars."

"Yes, but what about the capital?"

"You've got energy saving, faster schedules and reduced pull-ins to figure on. That's without allowing anything for the increased riding that would be bound to result if we took those old gunboats off the street. There's no question in my mind but that we've been blindly hanging on to some of this old stuff long past the time when it was profitable to do so. Of course, it's not up to us to say what's to be done, but it's a good thing to give the old man the dope. I'll bet if he takes that kind of a proposition into the staff meeting the transportation department and the new commercial department will be ready to hug him."

"Well, all right, Dick, I'm going to beat it for home before my wife comes after me. It's going to be kind of interesting to see what the old man has to say."

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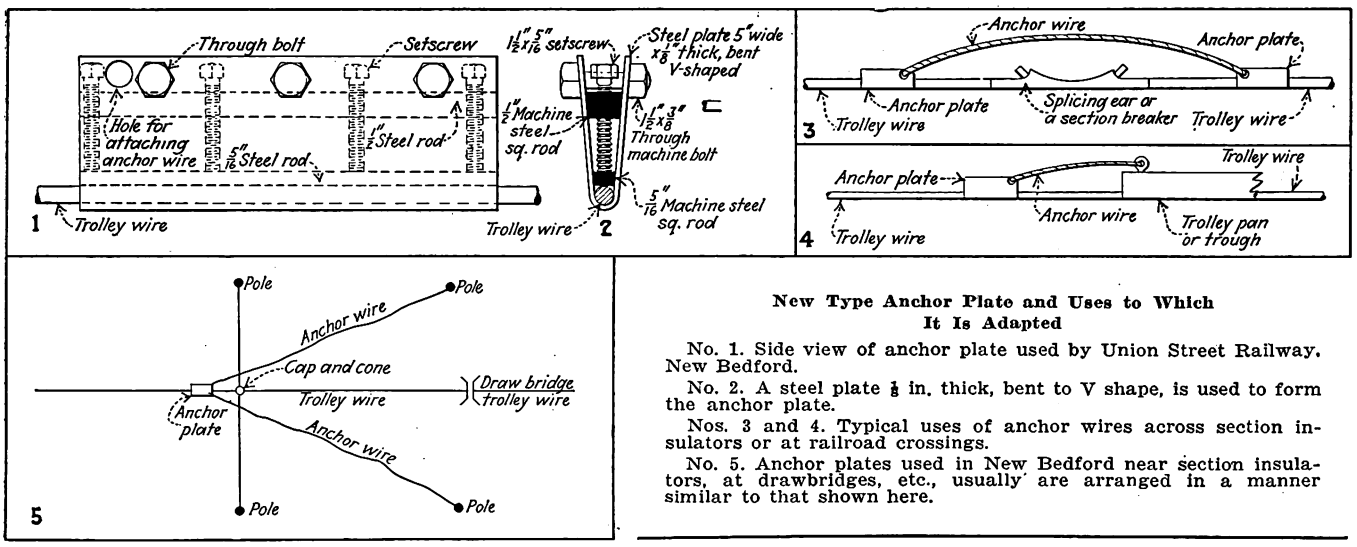


New Type Anchor Plate and Uses to Which It Is Adapted

No. 1. Side view of anchor plate used by Union Street Railway, New Bedford.

No. 2. A steel plate ⅛ in. thick, bent to V shape, is used to form the anchor plate.

Nos. 3 and 4. Typical uses of anchor wires across section insulators or at railroad crossings.

No. 5. Anchor plates used in New Bedford near section insulators, at drawbridges, etc., usually are arranged in a manner similar to that shown here.

rod presses against the three through bolts at the top of the plate. By this means the plate is securely held in place on the trolley wire. As will be noted, the trolley wire is not damaged by soldering and remains intact when the anchor plate is removed. This has proved advantageous when it is found necessary to change the location of the anchor plate.

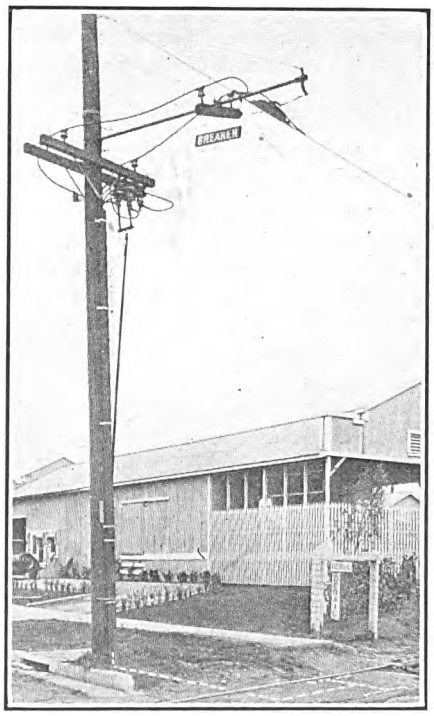
Various uses have been made of these anchor plates. They are used to hold an anchor wire where section breakers or splicing ears are located and wherever any strain on the trolley wire must be relieved. Trolley wires that go into trolley troughs or dead-end at drawbridges are an example of these uses. These anchor plates are also used in locations where there is a long stretch of unanchored trolley wire, to prevent strain on the span wires. Not only have these anchor plates proved inexpensive to make but they have given satisfactory results in the several hundred places where they have been in use.

Double Sectionalizing Switch for Oil Sidings

BY L. H. APPEL
Assistant Superintendent of Power Pacific Electric Railway, Los Angeles, Cal.

TO SAFEGUARD the loading and unloading of petroleum products the standard practice of the Pacific Electric Railway is to install a combined trolley and track sectionalizing switch on all spur tracks serving industries which handle oils and gasoline. This provision, together with that of installing insulated flange unions in pipe lines, has proved very effective in preventing electric sparks, which under certain conditions may cause serious troubles in the presence of fuel oil, distillates of gasoline, etc.

The double sectionalizing switch de-energizes both the trolley wire and the track at the siding, thereby removing any potential hazard that might exist if the trolley were left energized while tank cars were being handled. A double-pole, single-throw switch is used, which consists essentially of two copper blades fastened to insulators which are installed on cross-arms attached to the pole. One blade is used for controlling the trolley circuit and the other for the track circuit. A standard maple sectionalizing insulator is inserted in the trolley wire and white fiber insulated joints in the track.



Combined Trolley Wire and Track Sectionalizing Switch in Open Position

The trolley switch blade when closed permits the circuit to be completed or shunted around the circuit breaker and similarly the track switch blade permits the circuit to be shunted around the insulated joints, thereby allowing normal operation of the spur. Both blades of the switch are operated simultaneously by means of a long pole permanently fastened to the insulated blade head. This can be padlocked in either the open or closed position by train crews.

The switch is kept open normally so that the trolley and track are de-energized and is closed only when the spur is actually in use for electric operation. In addition to the use of this equipment for sidings serving plants where oils are handled, which include approximately 75 installations, a number of single insulating switches have been installed on sidings which serve industries operating clamshell shovels or other loading and unloading equipment which might come in contact with the trolley wire. The single switch installations provide for an insulator in the trolley wire only, as it is not necessary to insulate or de-energize the track.

Labeling Parts in Storeroom Shelves

DUE to the miscellaneous character of maintenance parts stored in the storeroom of the Southern Pacific Company at its Beaverton, Ore., shops, a flexible method for installing labels is required. An entirely satisfactory method has been devised through the use of a long metal slide 2 in. wide which runs the entire length of the storeroom shelves. These slides per-

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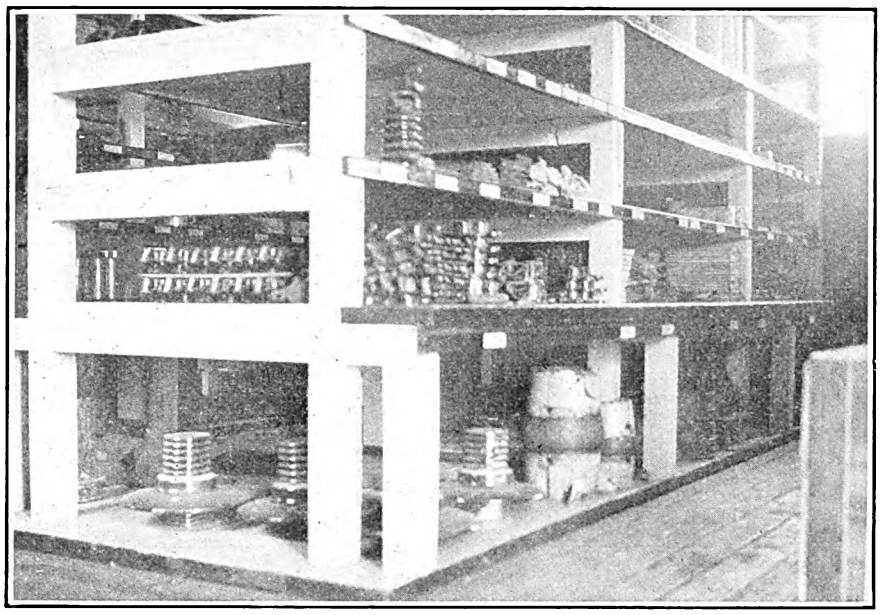


Metal Slides for Inserting Labels Are Used in the Storeroom of the Southern Pacific at Beaverton, Ore.

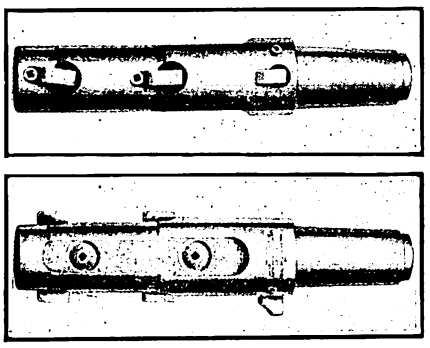
mit labels for the adjacent parts to be inserted where required, and after insertion they are protected with celluloid covers. This keeps them clean and gives a neat appearance.

Space required on the shelves for the storage of parts can be more economically used with this construction as the parts can be placed so as to make the best arrangement without regard to the location of labels.

New Equipment Available

Car Wheel Boring Tool with Wide Range Expansion

DESIGNED for the heavy-duty service of boring electric railway car wheels, a boring tool has recently been placed on the market by



Heavy-Duty Car Wheel Boring Tool

the Liberty Machine Works, St. Louis, Mo. The new boring tool has a triple arrangement of cutters, each set boring independently of the other. One set is for the rough-boring operation and a second for the finishing. The arrangement is such that the finishing cutters engage immediately after the roughing cutters clear the work. After the finishing cut is taken a third pair at the top of the tool chamfers the hub.

Each pair of cutters is uniformly expanded to the desired size by means of a cam arrangement controlled by a micrometer dial graduated in thousandths. This insures close adjustment to the desired size. One of the features of the tool is the hardened cutter support, the purpose of which is to insure a rigid holder for the cutters and to prolong the life of the tool by preventing disintegration on the surfaces where the tips come in contact with the tool body.

These hardened cutter supports permit setting the roughing cutters to the correct rake and angle. The cutter is set at this rake instead of grinding away part of the surface, as is the general custom. By inclining the roughing cutters, their life is materially increased, the tendency to heat is decreased and faster speeds are permitted.

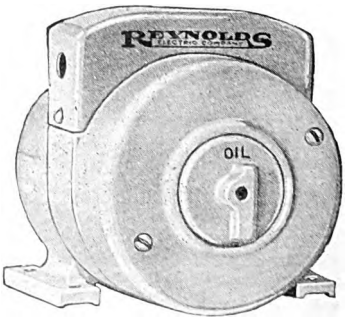
The new car wheel boring tool has a wide range of cutter expansion the purpose of which is to reduce cutter costs by using more of the high-speed steel on each set of cutters. The cutter locking device consists of a special screw lock which locks both cutters metal to metal. This arrangement insures uniformity of sizes and gives rigidity.

The tool is furnished in ten different sizes for boring steel, chilled or cast-iron car wheels. Sizes for the former range from 3¼ in. to 4¼ in. to 6¾ to 9½ in. and for the latter from 3 in. to 4¼ in. to 5¼ in. to 7¾ in.

Motor-Driven Flasher Unit for Warning Signals

RUGGED construction and small size are outstanding characteristics of a new unit flasher just brought out by the Reynolds Electric Company, Chicago, Ill. This flasher is for use with warning signals, crossing lights, blinkers, traffic guides, etc., as used by electric railways. The flasher mechanism is driven through a train of gears from a standard motor and all the mechanism is built into the special motor frame, so that the flasher is self-contained. The flasher is furnished with either one, two or three brushes, so as to handle a like number of circuits. The brushes ride the contactor drum without movement or vibration and special precautions have been taken which provide long life. The contactor drum operates on a quick make and break principle which is new in flasher construction and gives increased life and reduces failures.

The capacity of the unit is from 400 to 800 watts per circuit. The



New Self-Contained Unit Flasher

mechanism can be installed either inside or outdoors and its small size permits of mounting on a shelf against a wall if desired. The units are finished with two speeds, 60 r.p.m. and 7 r.p.m., so as to give respectively speed for flashing circuits on and off 60 times per minute or seven times per minute.

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Association News & Discussions

Bus Maintenance and Lacquer Painting Discussed by C.E.R.A. Master Mechanics

Annual Meeting of Central Electric Railway Master Mechanics' Association at Akron, Ohio, Was Attended by Fifty Men from Central District—Topics of Interest to Interurbans Discussed

LIVE topics of particular interest to master mechanics brought out 50 men for the annual meeting of the Central Electric Railway Master Mechanics Association held at Akron, Ohio, on Feb. 11. The business session began at 9 o'clock and with an adjournment of one hour for lunch continued up to 2:30 p.m., after which an inspection trip was made through the shops of the Northern Ohio Traction & Light Company, where demonstrations were witnessed of equipment and methods used in maintaining buses and a demonstration of lacquer painting of electric cars.

Of the various committee reports, that on uniform charges to interchange of equipment brought out considerable discussion. F. J. Foote, chairman of the committee, presented the report, together with a revised list of prices for air-brake equipment. The report, including the revised prices, was adopted.

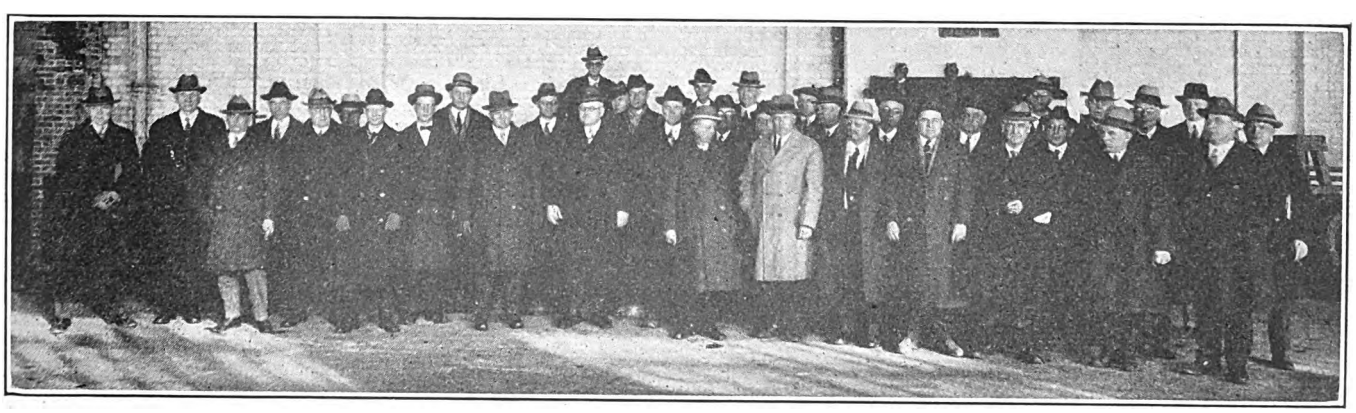
A committee was appointed to arbitrate disputes as to the responsibility for payment of parts replaced in interchange freight service. C. W. Squier, secretary of the equipment committee of the American Electric Railway Engineering Association, presented a request for consideration by the Master Mechanics' Association of two specifications now in the Engineering Manual. These specifications were E 100-12 for automatic couplers for interurban cars and radial draft rigging, including M.C.B. specifications for couplers, and E 101-12 specifications for the location of the end connections on interurban cars used in exchange service. No revisions to these specifications have been made since 1912, and as both refer to interurban equipment it was thought that the Central Electric Railway Association men were in best position to recommend changes in revision. The matter was referred to the standards committee of the association for study and report at the May meeting.

D. A. Scanlon, general superintendent of the railway department of the Northern Ohio Traction & Light Company, referred to a request which he had received from the Cleveland Railways to provide lights on freight trailers which operate through the streets of Cleveland. It appears that several accidents have occurred from automobiles running into cars which were without light. A committee was appointed to study the subject of providing a satisfactory method of illuminating the freight trailers so that such accidents will be prevented and so that a uniform method can be used by all roads of the district. This committee is to report at the May meeting of the association. Mr. Scanlon also brought up the subject of providing containers for way bills in interurban freight cars. After some discussion of this subject, it was referred back as being out of the field of activities of the Master Mechanics' Association. Discussion of the subject of loading cars beyond the stenciled weight brought out the fact that sometimes cars were loaded far beyond what they are supposed to carry. More attention will be given to this subject, as the tariff is supposed to be based on the stenciled weight with 10 per cent overload allowed.

Several changes were suggested in truck construction for the standard freight trailer which was adopted by the association. These changes were presented by a representative of the American Car & Foundry Company, and included some points which will reduce cost of construction and also provide increased life to trucks. The changes were approved and drawings will be changed to correspond.

The new officers of the association elected are: P. V. C. See, superintendent of equipment Northern Ohio Traction & Light Company, president; E. B. Gunn, master mechanic Western Ohio Railway, vice-president; together with an executive committee consisting of Fred Heckler, superintendent of motive power Lake Shore Electric Railway; F. J. Foote, superintendent of motive power and equipment Indiana, Columbus & Eastern Traction Company; J. W. Osborne, superintendent of equipment Terre Haute, Indianapolis & Eastern Traction Company, and A. W. Redderson, superintendent of motive power Indiana Service Corporation. A resolution commending the work of the retiring president, T. H. Nicholl, superintendent of motive power Union Traction Company of Indiana, was presented and adopted. He was also appointed as new chairman of the standards committee in place of C. M. Bange, resigned.

Two papers were presented, abstracts of which appear elsewhere in this issue. The first was a discussion of the lacquer system of painting, presented by J. S. Spratt of the Valentine Paint Company. In the discussion following presentation of this paper, questions by the master mechanics brought out information that the manufacturers do not recommend the applying of lacquer paint on top of old painting, as the old surfaces vary greatly and consequently varying results are obtained, many of which are unsatisfactory. Where paint is entirely removed the lacquer does not penetrate the wood, therefore some appropriate filler must



Master Mechanics of Central Electric Railway Association in Attendance at Akron Meeting

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be used. Mr. Spratt said that the fourteen hours time given for finishing an average car requires a room temperature of at least 65 deg. No special spray gun is needed for the application of lacquer paint, and there are no special requirements by the fire underwriters over what is required for varnish removers. The powder that settles from the use of lacquer painting systems is not an explosive. Where spots are slow in drying this is evidence that the surface to which the lacquer paint is applied has not been thoroughly cleaned. After the lacquer paint has been applied cleaning with a dry cloth or with water is recommended. Car cleaning preparations can be used with success, provided they do not contain an excessive amount of alcohol. There are some lacquers that can be applied with a brush, but the spraying method is more satisfactory and more economical. The brush lacquers are improving rapidly and there are some over which varnish can be used, but the large majority cannot have varnish applied with success. There was considerable discussion as to economies that could be expected from the use of lacquer painting. The principal one of these results from the rapid drying of the lacquer paint so that cars are not out of service for extended periods. The general opinion of the master mechanics present was that there is no particular saving in time of application over that which would be obtained by spraying paint or enamel. Lettering can be done successfully with either lacquer paint, oil type paints, or enamel. P. V. C. See said that he had nine different kinds of lacquer paint in use. These were all applied over old paint surfaces. None has been in use a sufficient length of time to show definite results for comparisons.

A very complete paper on bus maintenance and gas engine operation was presented by E. Wooton, sueprintendent of equipment Chicago Motor Coach Company, an abstract of which is published elsewhere. Questions to Mr. Wooton brought out information that he renews oil every 2,500 miles and that he does not attempt to reclaim oil. The amount of extra equipment required for maintenance and overhauling is about 2 per cent for wrecks, overhauling, cripples, etc., and an additional 2 per cent for inspection. Probably a total of 5 per cent would be a good average figure to use. During the winter season in Chicago, radiator covers are used, but no alcohol is placed in the radiators. Skid chains are not used. The cost of maintenance by the Chicago Motor Coach Company during the past year was approximately 5½ cents per coach-mile. Mr. Wooton said that his company hoped to reduce this to 5 cents during the coming year. Depreciation of buses now used in Chicago is figured on a ten-year basis. Of course, this would vary considerably in different localities. The company has a very complete record system, so that it can tell when maintenance costs amount to more than the interest would be on the investment for a new coach. This accurately determines the point at which it is economical to scrap old equipment. Present equipment used in Chicago does not have starters, but Mr. Wooton said that larger equipment of six-cylinder engines would need starters. The scheduled speed is 10 m.p.h. in Chicago. This is figured by taking the mileage operated by the buses and dividing by the payroll time.

D. P. Cartwright of the North East Electric Company, Rochester, N. Y., presented two reels of motion pictures showing the electric starting, generating and ignition systems of buses.

The business sessions of the Master Mechanics' Association were held in the Terminal Building of the Northern Ohio Traction & Light Company, and this company also furnished a very attractive luncheon at the Portage Hotel, which was attended by the master mechanics and their friends. After the business session was completed, buses conveyed the party through the downtown garage of the company and out to the Kenmore Shops, where demonstrations were given regarding methods used in maintaining buses and also a very complete demonstration of the lacquer painting system. This latter demonstration was given by representatives of the Valentine Paint Company and included the application of all the various coats to an electric car. The car had been previously prepared with sections partly finished, so that the application could be demonstrated in a short time. This demonstration was with the application over old paint, and also included work necessary for patching. The next meeting of the association was arranged to be held in Decatur, Ill., some time in May.

Lacquer Painting Reduces Time Needed for Drying*

By J. S. Spratt
Valentine Paint Company

PAINTING by the nitrocellulose system involves three principal materials, primer, surfacer and enamel—each a nitrocellulose product, engineered to perform correctly its special function and capable of combining the completed system into a perfect whole.

Nitrocellulose primer is a true nitrocellulose material and forms the foundation of the nitrocellulose system. It is a nearly clear material carrying only sufficient finely ground red oxide of iron to enable the operator to see whether or not he has applied an even coat over the entire surface and it possesses adhesive qualities equal to the best varnish or oil type primers. It is furnished ready for application and is applied with a spray gun in a thin, even coat. It is suitable for use on metal of all kinds or wood surfaces. However, on new wood it is necessary first to apply a coat of oil type primer or wood filler such as standard paste wood fillers. This is necessary because lacquers do not penetrate wood, forming only a protective film on the surface, and to prevent moisture creeping into the wood through some break in the film which would cause the nitrocellulose material to peel it is necessary to use a penetrating material of this type.

Nitrocellulose gun glaze or surfacer is the material that might be termed "the keystone of the arch of the complete nitrocellulose system." It clings perfectly to the nitrocellulose primer and forms a perfect surface on which to apply the nitrocellulose enamel. It takes the place of the usual lead, half and half glaze, surfacer or rough stuff and sealer coats, thereby greatly simplifying the system as well as increasing its durability. Nitrocellulose gun glaze or surfacer possesses remarkable filling properties and goes on very smoothly. For use on cars it can be applied to give a sufficiently smooth surface without sanding. However, on buses, or where a perfect surface is demanded, it may be sanded readily to extremely smooth surface. Gun glaze or surfacer may be double or triple coated at one operation, applying more material where surface conditions call for a heavier coat, or it may be applied one coat at a time as desired. It air dries in a few hours at ordinary room temperature, ready for water sanding. Where the surface is not to be sanded, nitrocellulose enamel may be applied within an hour after the application of the last coat of gun glazer or surfacer.

The third and final material of the nitrocellulose system is nitrocellulose enamel. It is applied by the usual spray methods and it will be found that it sprays on very smooth and with quite a sheen. It can be supplied in any color. All nitrocellulose materials are supplied by the different manufacturers in heavy liquid form and should be thinned with solvent to the proper consistency before spraying. This is done for the purpose of avoiding settling, and for this reason the primer is supplied ready to apply as it contains only sufficient pigment for a guide coat.

There are as many kinds of lacquer furnished by various manufacturers as there were kinds of varnish and paint material furnished in the old days, and you will secure as widely varied results as you would from the range of varnish materials.

In the use of nitrocellulose materials I would recommend that you secure the materials for the complete system from one manufacturer, so that they are properly engineered, one material with another, as I believe that this is the only way in which you can secure uniform results.

Standard practice for a complete nitrocellulose system is one coat of primer, two or three coats of gun glaze or surfacer and two or three coats of nitrocellulose enamel. On street cars this entire system can be applied in one day. You can secure nitrocellulose materials which are elastic enough so that if you desire they may be var-

*Abstract of paper presented before the C.E.R.A. Master Mechanics Association, Akron, Ohio, Feb. 11, 1926.

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nished over. These materials may also be polished to a very high luster if desired.

Without polishing a complete nitrocellulose system can be sprayed on a 45-ft. street car in approximately fourteen hours. If it is desired to sand the surfacer or gun glaze this increases the total time to an average of twenty hours.

Nitrocellulose materials are nonporous and therefore very easily cleaned, as dirt settling on them does not grind in as it does on varnish and oil enamels. The material becomes extremely hard and each time it is cleaned acquires more luster, so that for a period of time the car is getting brighter, while with the varnish type system it is steadily perishing.

Bus Maintenance an Important Part of the Chicago Operation*

By E. Wooton
Superintendent of Equipment Chicago Motor Coach Company

NO TWO bus properties can be operated exactly on the same principle, nor can the equipment be maintained in the same manner. I think, however, that the operation and maintenance methods practiced in Chicago can be used as a basis. We operate approximately 420 coaches, which are housed in four different garages, besides the central repair shops where all major repairs and painting are carried out. Garage superintendents are held responsible for the mechanical condition of the equipment in their respective divisions. They report direct to the superintendent of equipment, so that each division is on a competitive basis. Each division superintendent has a clerk who takes care of the clerical work, which consists principally of ready reference records of the equipment, gasoline and oil consumption and individual coach mileages. All reports are sent direct to the chief equipment clerk, who examines and files them in proper order, and at the end of the month makes up various kinds of comparative statements.

All coaches are held in for inspection on a 2,500-mile basis and a garage operating 100 coaches will run approximately 10,000 miles a day, which would represent four inspections per day. Two of these inspections would be held during the morning rush, the other 98 coaches would be scheduled for service. All inspections are completed and coaches scheduled for the afternoon rush.

During these inspections units are examined on a regular routine system, and should any of them be found defective or not considered capable of running until the next inspection the unit is removed and replaced with an overhauled one, the defective unit being returned to the central shops for repairs. The mechanics making the inspection have a complete report of the performance of the coach since its last inspection, therefore if any unit has been giving considerable trouble, this report helps the mechanic to form his conclusions. A complete record of all units is kept at the central repair shops, unit change slips being sent through for all units removed from coaches.

Each garage has an auxiliary stockroom which is supplied daily from the central stores. All parts are carried on a maximum and minimum basis, but not in large quantities. For small parts, the minimum number to be carried is placed in a small canvas bag, so that the storekeeper knows, if he has to take the parts from the bag, that he is down to the minimum and should order replacements immediately. For large parts, the minimum number of pieces is tagged.

The inspection system, like that of all other railway equipment, is very important. It enables us to make up an estimated personnel based on an estimated mileage supplied by the transportation department, which gives a predetermined payroll. It assures that every man employed has something definite to do. He is occupied at all times carrying out work which avoids trouble, rather than waiting for trouble to develop in order to remedy it.

We find in most cases where failures occur that on analyzing the cause it was due to some apparently unimportant part failing first. We know that there are certain parts which deteriorate or wear. We will take, for example, the case of a radiator hose. During inspection the man who is accustomed to doing this work can tell very easily whether this connection is capable of running another 2,500 miles. If he is in doubt he will take it off and replace it with a new one, which will probably cost between 40 and 50 cents. If the old one is allowed to run along and give out on the road it would probably mean a ruined engine, and there are many like examples which apply.

Another feature of inspection is that it insures that all parts, such as universals, wheel bearings, etc., are lubricated at regular and proper intervals, which is very important. Do not neglect inspection of a vehicle which happens to be running perfectly to relieve something else which might be tied up, as this will finally spell disaster.

When a coach is held for inspection its oil and gas averages are referred to, as these are a good indication of the mechanical condition of the vehicle. Each division keeps on file a daily record of the gas and oil consumption of every coach, also the miles per gallon. Fuel and lubrication costs are among the highest items and should be watched constantly, coaches with low averages being given special attention.

When considering garage construction, we figure to allow 350 sq.ft. per coach and to build one inspection pit for every 20 coaches. We are very much in favor, where possible, of using the indirect heating system, which has the advantage of supplying a certain amount of circulation, also supplying the heat underneath the engines, where it is most beneficial in extreme cold weather, and can also be used for ventilating in the summer.

The central repair shops in Chicago are entirely self-contained and are connected directly with the purchasing department and the general stores, which is a great convenience, where such arrangements can be carried out. In these shops we maintain all the units, such as engines, clutches, transmissions, rear axles, etc. Schedules are arranged to bring all coaches through the shop once a year, the major work being replacement of panels, painting, etc.. Very little mechanical work is done, since our inspection system at the garages takes care of this work. We feel this is very much more economical than the old system of dismantling the chassis completely once a year, since there are no two units which have the same length of life. By using our present system we obtain the maximum mileage out of each unit before it is repaired.

We employ approximately 100 men at the central shops, which is about one man for each four coaches owned. In figuring space for the central repair shops we feel that about 100 sq.ft. for each coach owned is sufficient.

Through the courtesy of the North East Company, I have been able to obtain the services of D. P. Cartwright, with two of the company's films which

*Abstract of paper presented before the C.E.R.A. Master Mechanics Association, Akron, Ohio, Feb. 11, 1926.

COMING MEETINGS
OF
Electric Railway and Allied Associations

Feb. 24-26—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.

Feb. 25—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass.

March 5 — Metropolitan Section, A.E.R.A., 29 West 39th Street, New York, N. Y.

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11 — Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

March 12 — Pennsylvania Street Railway Association, annual meeting, William Penn Hotel, Pittsburgh, Pa.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

Oct. 4-8—American Electric Railway Association, annual convention, location not yet determined.

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give some of the elementary principles of the functioning of the gasoline engine and its electrical equipment. These explain several important points.

We have three different classes of motor coach operation, city service, interurban service and long-distance service, each of which is in a class by itself. Since my experience has mostly been in city service, I would strongly recommend that the equipment be constructed with independent units, such as engine, transmission, rear axle, etc., and that these units be built in such a manner that they can be removed quite readily without any undue mechanical work. This is of vital importance in order to keep down the maintenance cost and keep the coaches in revenue service.

American Association News

Uniform Dimensions for Cars Proposed

CONSIDERATION of uniform dimensions for cars was given by the manufacturers' engineering committee in a three-day session at association headquarters, New York, Feb. 15-17. A joint meeting with the committee on unification of car design was held on Tuesday. Those present at the meeting were G. C. Hecker, chairman of the manufacturers' committee, together with J. A. Brooks, C. A. Burleson, and W. J. Clardy; H. H. Adams, chairman of the committee on unification of car design, with the following members: L. J. Davis, H. F. Flowers, C. Gordon, J. W. Hulme, G. L. Kippenberger, C. W. Squier and V. Willoughby. J. A. Brooks of the manufacturers' committee is also a member of this committee.

After a careful study of various car designs submitted by car manufacturers, together with a review of weight, seating capacity, fundamental dimensions and salient features of cars purchased during the last five years, the manufacturers' committee has prepared four drawings embodying dimensions and features which it considered suitable to the requirements of average size city or interurban properties throughout the country.

It was the consensus of opinion that car and electric manufacturers, by agreeing on the general sizes, weights and arrangement of the cars suggested, would be in position to offer to the industry cars of essentially uniform type suited to meet the requirements of the average city or interurban operating conditions. It was thought that such general uniformity would not limit the application of individual initiative in the further development of appearance and structural details that would place each manufacturer's stamp of individuality on his product. The urge of competition, it was felt, would bring about the improvement and development of cars considered necessary from the standpoint of competition with other forms of transportation. The fundamental problem was held to be the construction of cars that would attract patronage and reduce operating cost. Second only to this in importance, it was felt, is that greater uniformity in basic dimensions could be brought about and would result in reducing both the first cost and maintenance cost of equipment.

In discussing the advantages of a general agreement among car builders and electrical manufacturers as to the proper sizes and weights of cars for average city conditions, emphasis was laid on the fact that such general agreement was eliminating much of the present confusion regarding the type of car best suited for service in a given city, particularly on the smaller properties.

For city service, the committee proposed a light weight double truck car arranged for four motors. Drawings of cars for double end and single end operation have been prepared, that for single end operation differing from the other only in the platform arrangement at one end. The car for double end operation is similar to that shown in the 1922 report of the committee on unification of car design with bodies having 10, 11 and 12 windows. The committee recommends arch type roof construction, tapered flush platforms, with a single folding step. The first step is 15 in. and the second 14 in. high. The height from the bottom of the sill over the roof boards is 8 ft. 10½ in., the over-all width 8 ft. 4 in. post centers 29½ in., aisle width 27 in., seat length 35 in. and wheel diameters 26 in.

These cars, with four 25-hp. motors and double end platform type control, together with all safety features, should have a maximum weight not exceeding 32,000 lb. The maximum weight with 35 hp. motors and double end train control with all safety features should not exceed 37,000 lb. In considering weight, the committee felt that in most cases these maximum weights would be materially reduced in cars as constructed.

The truck centers for the ten-window car is to be 16 ft. 6½ in.; for the 11-window car, 19 ft., and for the 12-window car, 21 ft. 5½ in. The wheelbase will vary from 4 ft. 10 in. to 5 ft. 4 in.

Drawings for light weight interurban cars for double end and single end operation similar to that for city service were also considered. These cars will be made for lengths requiring 10, 11 and 12 windows. Provision is made for a smoking compartment, the size of which can be varied by moving the partition a full window length or more. A lavatory can also be incorporated, occupying one or two windows. Other details agreed upon were a plain arch roof, straight flush platforms, with first step 15 in. and second step 14 in., height from bottom sill over roof, 8 ft. 10½ in., over-all width 8 ft. 6 in., post centers 33 in., aisle width 24 in., seat length 35 in., wheel diameter 26 in., length of platform 5 ft. 4 in. The design submitted had sliding doors and stationary steps, but the cars can be equipped with the folding doors and steps without radical changes in the design. Cross seats are provided, with longitudinal seats at the end seating two passengers each.

The interurban cars with four 25 hp. motors and platform control for single unit operation should have a weight not to exceed 30,000 lb. The maximum weight with 35 hp. motors and double end train control should not exceed 37,000 lb.

The committee has also given careful consideration to other types of city cars. It found that the trend of car purchases as shown by the statistical numbers of ELECTRIC RAILWAY JOURNAL show that the single truck car is being bought in decreasing quantities, and that the double truck, one-man, two-man car has become increasingly popular. The committee found that as far as the single truck car is concerned, practically every car builder is prepared to build the standard Birney car or a modified Birney car and they consider that little would be gained by attempting recommendations for a new type of single truck car.

Cars with both center and end doors were discussed by the committee, which brought out the fact that such cars are used on relatively few properties and most of these are large ones. It was also found that in each instance this type of car was designed particularly to meet certain local conditions and that there was practically no uniformity in design adopted by the different properties using them. The decision of the committee was that no single design of center and end door cars could be produced which would meet the requirements of the different properties desiring to use such a car. It was therefore agreed that the committee would not attempt to submit a design for this type of car.

Metropolitan Section Reviews Steel Industry

A TALK on the steel industry, illustrated by six reels of motion pictures, was delivered by George A. Richardson, manager of the technical division Bethlehem Steel Corporation, before the Metropolitan Section of the American Electric Railway Association. The meeting was held on Jan. 5 in the Engineering Societies Building, New York City.

Before the main speaker of the evening. R. F. Carbutt, railway engineer H. L. Doherty & Company, gave a brief report of the Central Electric Railway Association meeting held on Jan. 27 and 28 in Indianapolis. John A. Dewhurst, associate editor of ELECTRIC RAILWAY JOURNAL, also gave a report of the New York Electric Railway Association meeting held at the same time in the Hotel Commodore, New York. A clear note of optimism and a better understanding of the basic problems that have developed was the underlying thought of both meetings.

Despite the severe weather experienced, the membership list has constantly increased from 1,122 reported at the last meeting to 1,168 reported at the meeting of Feb. 5.

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The News of the Industry

Fare Question Up

Adjournment Follows Hearing Before Commission on Application for Higher Fare in Utica

Following the introduction of several exhibits setting forth the financial condition of the New York State Railways, Utica lines, and purporting to show the deficits sustained under a 7-cent fare, the railway rested its case on Feb. 17 in its petition to the Public Service Commission for permission to charge a 10-cent cash fare with provision for the sale of ten tickets for 75 cents. An adjournment was taken to March 10 to permit the city to examine the figures presented by the company and to prepare its case in opposition to an increased fare.

COMPANY READY TO CO-OPERATE

Clarence M. Williams, corporation counsel of Utica, announced to the commission that the city had retained Dr. Milo R. Maltbie to aid in the city's case. Mr. Williams asked permission of the company to have Dr. Maltbie examine the books to check the figures, but such consent was refused on the ground that it would delay the proceedings. The company through its counsel, Warnick J. Kernan, promised to supply the city with any information it desired, and Chairman W. A. Prendergast of the commission told Mr. Williams that the commission's accountants were now examining the company's books. Chairman Prendergast said that the full results of the commission's examination would be available to the city.

The valuation claimed for the Utica lines as of Oct. 1, 1925, by the company is fixed at $10,726,427. The company estimated that the proposed fare would yield an additional revenue per year of $96,403. This estimate was arrived at by using the number of revenue passengers carried in 1925, amounting to 16,000,229, and deducting 5 per cent for possible loss in patronage because of the increased fare. Of the 15,200,218 passengers remaining, it was estimated that 20 per cent would pay the 10-cent fare, giving a return of $304,004, and that 80 per cent would use the token fare, giving a return of $912,013. This would yield a revenue of $1,216,017.

EIGHT PER CENT NOT EARNED

The company, through exhibits prepared and sworn to by J. N. Joel, general auditor, claimed that in 1923, 1924 and 1925 it fell considerably short of earning an 8 per cent return on its investment. It alleges that it failed to earn a fair return even on the rate base fixed by the commission, which it contends was far too low, and claims that the earnings would return only about 2 per cent on the present fair value claimed by the company. It was claimed that the earnings fell $32,074 short of earning an 8 per cent return on the commission's rate base in 1923, $105,203 short in 1924 and $102,765 short in 1925.

Mr. Williams stated for the city that he would reserve any rights he might have to question jurisdiction of the commission to hear the increased fare petition. In 1922 a special term of the Supreme Court denied the city a writ of prohibition, but Mr. Williams said that he was not satisfied the decision of the special term was in accord with recent decisions of the courts on the question of jurisdiction of the commission where there are fare restrictions in the franchises of railway companies.

Baltimore Commission Approves Traffic Changes

A definite plan for the rerouting of cars of the United Railways & Electric Company, Baltimore, was adopted by the Baltimore Traffic Survey Commission at a meeting on Feb. 10. The plan approved by the commission is a combination of several lists of proposed changes. It was approved as the plan best suited for all concerned. The next step to be taken is the filing of a detailed report of the changes with the Maryland Public Service Commission. Public hearings will be held and the traffic body will be called upon to show why the changes should be made. It is said that the approval of the United Railways depends upon further action on the part of the commission. In this connection it is pointed out that if cars are ordered off one street and placed on another other traffic should be regulated to take care of the changes. The commission has still to report on vehicular and pedestrian traffic. A report covering these subjects is expected to be completed in March.

One of the most important features of the plan approved by the traffic commission is the removal of all cars from the downtown section of Lexington Street. The other features include the removal of all but one line from Charles Street, removal of one-man cars from the Halethorpe line and other reroutings.

The Baltimore Traffic Commission adopted the proposed changes after an exhaustive survey made by Kelker, De Leuw & Company, Chicago. The cost of the survey is being met by city, state and the United Railways. It was brought about as a result of suggestions that were made at the time the hearings were in progress that were held before the Public Service Commission to fix the valuation of the United's property. Mr. Miles is chairman of the commission.

Fare Plea in Binghamton

Seven-Cent Fare Continued Pending Settlement—Old Dispute On Over Franchise Restrictions

The temporary continuance of the 7-cent fare in Binghamton, N. Y., on the lines of the Binghamton Railway was recently authorized by the Public Service Commission pending a final decision as to the merits of the company's application. As a result a controversy of long standing is waging anew in which the city, the commission, the railway and the courts play prominent parts. On Jan. 30 the city filed a notice of appeal to the Court of Appeals from the decision of the Appellate Division.

The issue goes back to 1919, when the former receiver applied to the old Public Service Commission for an increase in fare from 5 to 6 cents. The city of Binghamton questioned the jurisdiction of the commission on the ground that there were restrictions in the franchises which limited the fare to 5 cents, but the commission overruled the city's objections. The city then applied to the Supreme Court of the State of New York for a writ of prohibition restraining the commission from granting a rate of fare in excess of 5 cents and restraining the receiver from charging a fare in excess of 5 cents. The writ was finally granted and entered on Dec. 17, 1919.

The receiver immediately took an appeal to the Appellate Division of the Supreme Court, but early in 1920, before the appeal could be argued, the Common Council of the city of Binghamton adopted an ordinance authorizing the receiver to collect a 6-cent fare for a period of two years. This ordinance contained a provision which precluded the receiver or the company from prosecuting its appeal while the ordinance was effective. Similar ordinances were subsequently granted covering the years 1923 and 1924.

In 1925 the Common Council of the city granted an ordinance consenting to a 7-cent fare for a period expiring Jan. 15, 1926. This ordinance contained no provision prohibiting the company from prosecuting the appeal from the order granting the writ of prohibition. The appeal came up for argument at the May, 1925, term of the Appellate Division, and a decision was rendered reversing the decision of the lower court and authorizing the prosecution of the original application to the Public Service Commission. The decision of the Appellate Division was based largely upon the ground that the restrictive provisions of the old franchises were intended to apply only to horse cars, and that when the horse car lines became electrified the 5-cent fare limitations contained in the old franchises became ineffective.

Upon the adoption by the Common

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Council of the city of each of the ordinances mentioned consenting to a fare in excess of 5 cents for a stated period an order was procured from the Supreme Court holding the writ of prohibition in abeyance for the period covered by the ordinance. An application was then made to the commission for permission to charge the fare permitted by the ordinance for such period. On Jan. 15, 1926, the authorization expired which had been passed early in 1925 by the commission to charge a 7-cent fare under the ordinance.

In view of the decision of the Appellate Division holding that franchises did not limit the rate of fare which might be charged, the company filed with the commission in December, 1925, an application to continue the 7-cent fare beyond Jan. 15, 1926, without asking for any consent from the city. The commission on Jan. 15 granted its temporary order.

Ten Cents in East St. Louis

The East St. Louis Railway, acting under a federal injunction restraining the Illinois Commerce Commission from interfering, advanced the basic fare in East St. Louis, Ill., from 8 cents cash to 10 cents on single fares, effective Feb. 14. The new schedule means single cash fares of 10 cents or five tokens for 40 cents. The old scale was 8 cents for single cash fares or two tokens for 15 cents. The interstate fare between St. Louis, Mo., and East St. Louis and to points beyond East St. Louis will not be affected by the change in the East St. Louis city fares for the present.

The railway took the matter before the federal court after the Illinois Commerce Commission had twice suspended action on the company's petition for increased fares. The company contended that the failure of the state body to take some action on the petition for increased fares was in violation of the United States Constitution. The petition was passed on by Federal Judges Page, Lindley and Evans and the injunction was granted by them on Feb. 5 at Danville, Ill.

The application for increased fares in East St. Louis was first presented to the state commission almost a year ago and final testimony in the case was heard in October.

$5,000,000 Program Awaits Cleveland Council's Action

John J. Stanley, president of the Cleveland Railway, Cleveland, Ohio, says that as soon as the amendments which have been suggested to the Tayler franchise are adopted he immediately will call for the sale of a large block of new Cleveland Railway stock to finance the first portion of the improvements.

The changes are very simple. It is intended to provide a wider range of fare limits to meet contingencies created by unusually expensive operating periods, to increase the interest fund from $500,000 to $1,100,000, and to set up a sinking fund for capital retirement.

The first offer will be to stockholders as usual. But if this fails to provide all the capital needed the amendments make it possible to offer the stock on the open market with a two point discount to encourage salesmanship on the part of banks and bond houses.

First call for stock subscriptions in the improvement program may run as high as $3,000,000, if present shareholders of the company subscribe as much as 10 per cent of their present holdings, and this probably will cover all the work that can be accomplished in 1926.

Here are some of the items in the improvement program:

Four new carhouses, one of the first being a new plant to replace the antiquated Cedar Avenue carhouse.

Rail extensions on Pearl Road to the city limits.

Bus extensions in all outlying parts of the city and the suburbs.

Purchase of at least 100 new cars and as many additional buses.

Beginnings on various new short cuts and private rights of way to speed up service on many congested lines.

Development of multiple-unit train service on heavy main lines.

Experiments with buses and street cars in various rapid transit combinations for express and local service.

The amendments are substantially those proposed last June by the metropolitan transportation commission.

Bay Cities Agitated Over Fare Increases

Recent Increases in Rates Authorized by Commission Result in Hatching of Fantastic Bus-Ferry Scheme—Oakland Commissioner Suggests Survey of Entire East Bay Problem

SHARP attacks are being directed at the California Railroad Commission by clubs and civic organizations of the East Bay as the result of a series of recent decisions raising rates on the Key System Transit Company's lines and ferry and the Southern Pacific ferry and denying the application of a new ferry company which wished to operate between Berkeley and San Francisco.

Berkeley is taking a leading part in the fight, because that city is very much interested in getting the new ferry for autos and pedestrians. Despite the inadvisability of provoking a ferry rate war and with it lower fares, this seems actually to have been the desire of some of the protestants.

The Railroad Commission found, however, that there is no present need for the new ferry, because the public is already adequately served by two competing lines. The commission found further that the new ferry would not lower rates, because the rate schedule filed with the franchise application was higher than on those of the competing lines. This decision, coming on the heels of two denials of rate rehearings requested by Berkeley and Oakland, stirred a storm of protest.

A. O. Stewart, president of the Golden Gate Ferry Company, denied a certificate by the commission, has asked for a rehearing. In the meantime he has suggested to Mayor John L. Davie of Oakland that Oakland and the ferry company go into partnership in a bus-ferry combination, the city of Oakland to finance a bus service to the waterfront and his company to run a ferry service to San Francisco from Oakland. This plan is now being considered by various civic bodies and may be put on the ballot at the next election.

In the meantime the higher rates are in effect on the Key and Southern Pacific ferries and the Key traction system. The Key got its increases as "emergency measures," following a higher wage award to carmen by an arbitration commission. Then, after this raise had been granted, the Southern Pacific requested a separate hearing, at which it demanded higher rates to jibe with those on its rival, the Key system. New rates for the Southern Pacific were approved by the commission and went into effect on Jan. 25.

Officials of Oakland and other East Bay municipalities attended these rate hearings and presented their side of the case. Their contentions were overruled and the increases granted by the commissioners, after due deliberation. Then followed a series of rehearing petitions, all of which were denied.

The plan hatched at Oakland to vote on a municipal bus proposition at the next election has many backers, among them the Mayor and at least one city commissioner. Whether the suggestion would appeal to two-thirds of the votes is doubtful. Taxes are high in Oakland. They went up last fall. Sentiment favors their reduction. A million dollar bus bond issue, such as has been proposed, would undoubtedly raise taxes, and for this reason many would vote against it. The same thing applies to Berkeley and Alameda, which would probably be asked to aid the bond issue. Berkeley is conservative. A municipal bond issue for buses would be unlikely to receive even a majority in that city. Alameda is small and its vote would be unimportant, so far as the general result is concerned.

City Commissioner Frank Colbourn of Oakland has suggested that a survey be undertaken at once of the entire East Bay transportation problem.

Monorail Discussion Revived at Detroit

Discussion of the construction of an elevated monorail system at Detroit has been revived, and a new request of the Michigan Elevated Railway to construct an experimental system has been taken under advisement by the Detroit City Council. Representatives of the company, members of the Detroit Rapid Transit Commission and of the Department of Street Railways were present at a recent hearing at which the proponents of the elevated system stated that the company was prepared to finance the undertaking without assistance. It was also proposed to furnish an indemnity bond insuring the city against expenses and accidents.

Similar requests have been received by the City Council during the past several years and an adverse report was referred to which was made by the Rapid Transit Commission after it had studied the proposed system.

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Seven Cents Sought in Elkhart

The Chicago, South Bend & Northern Indiana Railway applied to the Indiana Public Service Commission on Feb. 8 for authority to increase the cash fare on its Elkhart city lines from 5 to 7 cents and to sell tickets at the rate of four for 25 cents. The company sets forth that after the payment of its operating expenses, taxes and paving assessments for 1925 there was a deficit of $10,466 without making allowance for any return on money invested in the local system.

The company says, indicative of the necessity for the rate increase, that since the year 1916 the taxes on its property in Elkhart have increased 141 per cent; that since that year the cost of labor has increased approximately 100 per cent, and cost of material used in the maintenance and operation had increased approximately 85 per cent, that the cost of operating and furnishing that city service had increased approximately 100 per cent, and that in 1925 the railway suffered a decrease of $4,066 in its revenue from the street raliway lines compared with its average revenues for the period from 1921 to 1925 inclusive.

R. R. Smith, vice-president and general manager, said the company was forced to face the fact that it was impossible to continue longer the 5-cent fare in Elkhart. It was hoped the cost of operation would so recede that it could feel justified in continuing the 5-cent fare, but there seemed no likelihood of any recession in prices which would make that possible. He said the increase in the use of the automobile and the bus had seriously affected the earnings of the interurban line. The company published an advertisement explaining the situation.

Increase in Pay for Detroit Shopmen

A flat increase in wage of 5 cents an hour has been granted by the Street Railway Commission in Detroit to about 325 employees of the department's Highland Park shops. The men had asked an increase of 10 cents an hour, free transportation and a week's vacation annually with pay. The requests for free transportation and vacations were denied and the 5-cent increase was granted to the employees. The new scale included those who formerly received 80 cents an hour and those who received less than that rate but had been in the employ of the department two years or more.

A few weeks ago it was announced to the men that they would be permitted to work Saturday afternoons at the old rate of pay, but this arrangement was not satisfactory to them. They wanted an increased wage rate rather than a longer week with its increased amount. Only a few men took advantage of the opportunity at that time. The later recommendation of the general manager of the department that the men be allowed to work Saturday afternoons from Oct. 15 to April 15, if they wish, was adopted by the Street Railway Commission.

New Railway Line for Toronto's Suburbs

A joyous occasion was the opening some time ago of the Weston-Mount Dennis Street Railway under the supervision of the Toronto Transportation Commission, Toronto, Ont. Official ceremonies, followed by a parade, elaborate floats and congratulatory speechmaking, marked the happy day which brought the suburbs of York, Weston and Mount Dennis nearer the realization that some day they will be part of Toronto. The only lugubrious feature of the celebration was the carrying of the corpse of the old Toronto Suburban Railway, which formerly supplied service to these townships.

One hundred and fifty vehicles were in the parade. The line of march was through Mount Dennis to the northern limits of Weston, returning to the boundary line between Weston and York Township, where the official opening was held. A conspicuous part of the parade was on old horse-drawn car labeled "In Service Before 1891." Driving this was James Scott, who has served 33 years with the railway. After the old car came three of the modern red cars of the Toronto Transportation Commission carrying officials.

George S. Henry, Provincial Minister of Public Works, was the first speaker. He said that the occasion marked the passing of another milestone by the metropolitan suburbs of the city of Toronto. The fact that the Toronto Transportation Commission had undertaken to operate the transportation facilities showed the interest the city was taking in the suburbs. P. W. Ellis, chairman of the Toronto Transportation Commission, assured the people that the time would come when they would be part of Toronto. He said: "If a private concern were to take over the transportation it would lose money. But you are a good municipality and have fine borrowing powers. The agreement is fair to both sides."

Continuation Transfers in Irvington Not Needed

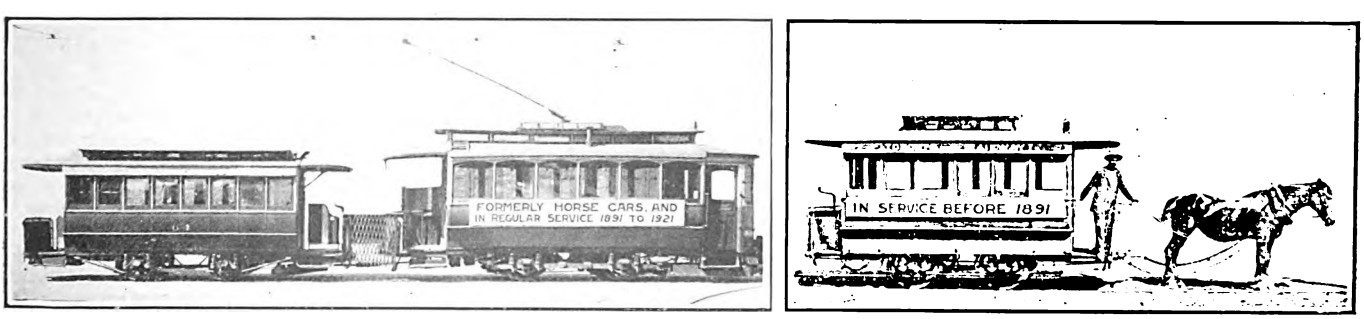
Issuance of continuation tickets by the Public Service Railway, Newark, N. J., from short route cars on Springfield Avenue to through cars has been held unnecessary by the New Jersey Board of Public Utility Commissioners. The town of Irvington sought to compel the company to grant continuation transfers without charge. It alleged that a person boarding a westbound car downtown after riding through two fare zones as far as Elmwood loop and desiring to reach a point west thereof would have to alight and pay an additional 5 cents to reach his destination.

The railway said that fare zones had been laid out in accordance with a plan intended to apply to the entire district and that to issue continuation slips would establish a precedent, cause undue hardship to one-man car operations and burden the company financially. It offered in evidence traffic checks to show that between 6 a.m. and midnight on a typical day 190 passengers arrived at the loop on 123 westbound car trips, but that only 24 transferred at this point to through cars.

$10,000,000 for Rolling Stock Suggested for Detroit

Within the next three or four years the Department of Street Railways at Detroit, Mich., should spend approximately $10,000,000 on new equipment and repairs to present equipment. H. U. Wallace, general manager, made this statement before members of the North End Progressive Business Men's Association on Feb. 16. This sum, Mr. Wallace said, could be paid from the earnings of the system without increasing the fare. At least 150 cars are obsolete and should be replaced soon. He said:

> These 150 cars outlived their usefulness long ago. They cannot be repaired and we are forced to keep them in service because we have no others to replace them. There are cars that should be scrapped or rebuilt, and others that should be repaired at once, about 750 in all.
>
> Even the Peter Witt cars are obsolete in some respects. They lack certain safety appliances which I consider essential, and the seats and floors should be changed. The seats are too hard and uncomfortable. We have found that leather upholstered seats have twice the durability of cane upholstered seats.
>
> As for the change in the manner of building floors, the new specifications for street cars call for battleship linoleum floors. These are easier to clean than the present wood slat floors, they add warmth to the cars, they have a better appearance, and they afford better footing for passengers in wet weather.
>
> It would not, however, be necessary to scrap these cars. They could be rebuilt and repaired.



An Exhibit that Appeared in the Line of March at Toronto

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Wage Agreement in Cedar Rapids

Negotiations over the wage scale of railway operators employed by the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, came to an end recently when the carmen agreed to renew a trial agreement of six months ending July 1, 1926. On that date they will get an increase of 2½ cents an hour, providing the company's revenues come up to the estimates made last summer in the city audit. If the increase is granted, it will be retroactive to Jan. 1, 1926. A similar agreement was made last July, but the company opened its books to show that business had not been as expected when higher fares were granted by the city and when the men were given one raise of 2½ cents last summer. The top scale is 52½ cents an hour for the carmen.

Pension Plan Under Consideration in Portland

At the annual banquet of the "Twenty-Year Club" of the Portland Electric Power Company, Portland, Ore., it was found that twelve of those present, including President Griffith, belong to the still more exclusive group known informally as the "30-year men." The combined years of service of the 278 members aggregate 6,661 years, and more than 50 new members have been added during the past year. The first woman to be admitted is Miss Annie I. Warnock, since 1906 assistant paymaster of the company. In two instances father and son are represented in the club, each having been with the company for 25 years.

Official announcement was made at the meeting by Franklin T. Griffith, president, that a general plan for an employees' pension system was under consideration by the company.

Philadelphia Will Not Appeal Fare Decision

City Solicitor Gaffney of Philadelphia, Pa., declared on Feb. 9 that no appeal would be taken by the city in the Philadelphia Rapid Transit Company fare case, in accordance with instructions received from Mayor Kendrick.

Mr. Gaffney said the city in its attack upon increased fares had for its objective the reduction of the company's operating expenses. He said that in a printed brief it had got together testimony in support of a drive principally against the amount of $8,560,400 set up each year since 1921 for maintenance and renewals, the 77 cents an hour wage payment and the federal income and other taxes.

The commission rejected the city's contention relative to the first two items and found in favor of the company. The reasoning of the commission in support of its findings, he said, had not shaken the conviction of the city in the soundness of its own contention. He referred to the case of the City of Scranton vs. the Public Service Commission, in which the city of Scranton appealed the decision of the commission. Mr. Gaffney quoted in part what Judge Porter said in this case: "We are of opinion, after mature consideration, that we are without authority to set aside a finding of fact by the Public Service Commission which is supported by substantial evidence where no constitutional question is involved." Mr. Gaffney said that that case had been followed and approved in a number of later cases.

The United Business Men's Association, which was a protestant in the fare case, has decided that it would not appeal the decision of the Public Service Commission in upholding the Philadelphia Rapid Transit Company's petition for maintenance of the 7½-cent fare.

Suburban Passenger Report at New York Due Soon

Governor Smith of New York has signed the Webb bill as Chapter 2 of the laws of 1926, extending to March 15, 1926, the time in which the commission created in 1925 to investigate and report upon the suburban passenger transportation problem of the city of New York must report to the Legislature.

Waukesha-Milwaukee Franchise Approved

The public utilities committee of the Common Council of Milwaukee, Wis., recently approved the application of the Milwaukee Electric Railway & Light Company for a franchise to operate the new Waukesha-Milwaukee high-speed electric line. A dispute was in progress for some time between the company and the City Council over the legality of this new high-speed line. After the company had secured a certificate of convenience and necessity from the commission, the city said that a franchise was necessary in view of the fact that the line would block numerous streets in the city. The company argued that the new line was in reality an extension of the present Clybourn Street line, and would be entitled to operate under the franchise granted in 1910. The company has not yet signified whether it will accept the grant.

Reorganized Company in Ohio Resumes Operations

The Nelsonville-Athens Electric Railway started operations on Feb. 8 between Nelsonville and Athens, Ohio. This is the new company which grew out of the reorganization following the abandonment of the Hocking-Sunday Creek Traction Company. This line had been in receiver's hands for months and was out of operation for weeks. It was sold late last year to E. B. Young, former general manager of the company, for $41,500. At that time the bondholders purchased the railway through Mr. Young, who said that he would resume operation of the system.

The company will operate a bus line as an auxiliary to the traction line. Buses will meet each interurban car and operate over a scheduled route in the city of Athens, Ohio, thereby giving hourly service over the principal streets of the city.

Service in Syracuse Explained

Education of the public to a realization of the company's imperative need of greater revenue by an increase in fares in Syracuse, N. Y., has been undertaken by the New York State Railways. The company has a petition before the Public Service Commission asking for a 10-cent cash fare rate and a rate of 7½ cents for ticket riders.

The advertising campaign which the company is promoting consists of a series of statements designed to arouse interest in the public utility.

One of the advertisements consisted of a condensed financial statement for the three years ended Sept. 30, 1923, 1924 and 1925. In 1923 the company had a shortage of $404,013. In 1924 it was $387,522, and for 1925 $388,543. One of the advertisements says in part: "A shortage of $1,180,079.42 in three years. How would you like to run a business that couldn't make a reasonable profit? In the face of these figures we believe that you will agree that your trolley company is giving far more than ordinary public service." In other statements the company has explained its business in detail, what the cost of public improvements meant, how much it cost to maintain service, how much of the fare goes for wages, and other pertinent questions.

Tired of Playing Tacoma Mayor's Game

The Puget Transportation Company, operating buses in Tacoma in competition with the lines of the Tacoma Railway & Power Company, at a recent meeting of its board of trustees, defied Mayor A. V. Fawcett to make good his reported threat to revoke the bus permits issued the company. The action is a step in the quarrel between the Mayor and the bus company, declared by company officials to be a political move on the Mayor's part. George Vandeveer, attorney for the company, charges the Mayor with a plan to purchase the Tacoma railway for the city and of using the company as a club to beat down the price of the street railway system. The trustees of the bus company state they will continue to operate the buses as long as it is possible, in the hope of salvaging something for the stockholders.

Utah Association Does Work of Mercy

The Traction and Power Mutual Aid Association, a body composed of employees of the Utah Light & Traction Company, the Utah Power & Light Company, Phoenix Utility Company and Western Colorado Power Company, held its annual meeting on Dec. 16, 1925, at Salt Lake City and elected officers for the ensuing year. The secretary's report showed that the association paid death claims of $6,000 during the year 1925, and for sickness, accidents and service refunds the sum of $4,656. A surplus of $14,303 was divided among the members in the usual form of a Christmas dividend of $15 each for twelve months membership and fractional time at the same ratio, 979 members participating in this.

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Interurban Station Ordinance at Kansas City to Be Rescinded

At a meeting of the City Council of Kansas City, Mo., on Feb. 8 an ordinance was introduced into the lower house of that body with a view to repealing the franchise of the Central Interurban Station Company. The repeal ordinance was referred to the conference committee.

The original franchise, granted on Jan. 9, 1918, provided for a union interurban station at the northeast corner of Tenth and McGee Streets. The building was to have been a combined station and office building to cost $3,000,000.

Work on the proposed structure was to have been started by the station company within one year of the granting of the franchise. Two of the interurban companies which were to have participated in the plan met later with financial difficulties and the Kansas City Railways was placed in receivership. Officials of the terminal company secured two extensions of the time limit passed by the city fathers, but continued financial obstacles and the advent of many bus services, both in the city and between it and other cities in this vicinity, gradually caused the dream of the central interurban station to fade almost beyond recall.

In an interview several month ago, C. C. Peters, president of the company, admitted the improbability of the project's ultimate consummation, due to the much-altered general conditions in this section since the World War.

A part of the ground which was to have been the site of the station has been leased by the company during the last several months for a parking station, at an annual rental said to be little more than enough to pay the taxes and interest on the realty. No announcement has been made of plans for selling the property, in the event the franchise is repealed.

Rhode Island Railway Seeks Market for Surplus Power

In a bill filed with the Rhode Island Legislature authorization is asked for the incorporation of the United Electric Power Company at a nominal capitalization of $100,000. According to the petition, the new corporation would take over the power house and transmission lines of the United Electric Railways, Providence, and provide for the power requirements of electric railways, lighting, transmission and manufacturing purposes. The incorporators are Albert E. Potter, president of the United Electric Railways; Zenas W. Bliss, George H. Newhall, Harvey A. Baker, Ralph S. Richards, Edward B. Aldrich, J. Cuncliffe Bullock and Harold J. Gross, all directors of the United Electric Railways.

Bond Legislation Likely in New York

It seems likely that the Legislature will pass at the present session an amendment to the Constitution giving to New York City an exemption from its debt limit of $300,000,000 which may be raised by bonds for the building and equipment of subways. The original proposition was for an exemption of $275,000,000, but the legislative leaders are inclined to go a step further and give an additional $25,000,000 exemption. The measure will have to be repassed by the Legislature of 1927. It can then be submitted to the people and the money made available under its provisions for construction work in 1928.

Increase in Fare Sought in Albany

The United Traction Company, serving the cities of Albany, Troy, Watervliet, Rensselaer and Cohoes, N. Y., has filed application with the Public Service Commission to increase its fare from 7 to 10 cents, with the sale of thirteen tickets for $1. Hearing on the application will be announced at an early date.

Discussion of New Franchise in Richmond, Va., Renewed

Negotiations are being conducted between the City Council in Richmond, Va., and the Virginia Electric & Power Company for a blanket franchise covering all of the lines operated by that company. Some of the franchises which the company now has it considers perpetual. Others run to 1940. One expired on Jan. 1. It is the purpose of the company and the city to try to draft in conference a complete franchise satisfactory to both. One objection to some of the present franchises is that they specify the routes. Some also specify the headway. These conditions have prevented the company from improving the service as much as it otherwise might have been able to do. If the new franchise goes through, the company will probably reroute its cars down town and extend some of its rail and bus lines.

The law requires new franchises to be offered at public auction, but it does not require the city to accept the highest bid. The city is permitted to accept the bid it considers best for the city from every point of view.

News Notes

Will Rehear Fare Application.—The Pacific Electric Railway has been granted a rehearing by the Railroad Commission on its application for an increase in railway and motor coach fares in the city of Pasadena, Cal. The rehearing will be held before Commissioner Seavey in the court room of the commission at Los Angeles on March 16.

Pass System in Effect.—The Kingston, Portsmouth & Cataraqui Electric Railway, Kingston, Ont., started selling the first of the year a weekly pass for 75 cents.

One Day Off Bill Reappears.—Under the provisions of a bill introduced in the New York Senate by James L. Whitley, Republican, of Rochester, in which city the traction and bus company are operating under a service-at-cost-plus plan, the railroad law is amended to require operators of street surface railroads, trackless trolley or omnibus lines in cities or villages to give employees one day of rest in seven.

New Paper Appears.—The Jacksonville Traction Company, Jacksonville, Fla., started recently the publication of a pamphlet called the "Palm Leaf." It is to be issued every month for the benefit and entertainment of the employees. E. Q. Brown is editor.

Change in Name Desired.—At a recent special meeting held in Cleveland the directors of the Northern Ohio Traction & Light Company, Akron, Ohio, voted to change the name of the company to the Northern Ohio Power & Light Company. The action must be ratified by stockholders and a special meeting to act on the recommendation has been called for March 15.

Wages in Spokane Increased.—J. E. E. Royer, assistant general manager of the Spokane United Railways, Spokane, Wash., recently announced that an increase of pay for 218 railway men had been granted by the company to date from Feb. 1. The plan of the company to increase the pay of its street railway operating force came out in the hearing of the street car fare increase at Olympia, when officials of the company testified that $26,000 had been set aside for that purpose in the 1926 budget, or approximately $10 per month per man on an average. Mr. Royer said that the men were entitled to share in the fare increase; that the public had accepted the increase without protest and it was well that it should know that the men are to get a share of the slight addition to the fare. The fare settlement has been referred to in these pages.

Ten Cents in Belleville Allowed.—Efforts of City Attorney L. N. Perrin of Belleville, Ill., to prevent the East St. Louis & Suburban Railway from collecting a 10-cent fare on its cars in Belleville failed on Feb. 9 when United States Judge Lindsey in Chicago overruled a motion of the city for a modification of an injunction granted to the company several years ago. The injunction restrains the Illinois Commerce Commission from interfering with the rate charged by the company. The state commission was restrained on the grounds that the restrictions placed by the commission were confiscatory and in violation of the constitutional rights of the company. On Jan. 24 the fare in Belleville was advanced from 7 cents to 10 cents over the protest of the city officials. The city had sought to reopen the injunction case on the ground that the character of the company's business had changed since the granting of the injunction due to an extension of the Belleville city limits.

Refuses Request for Terminal.—The City Commission of Trenton, N. J., has refused the request of the Public Service Railway to establish a trolley terminal at Liberty and Adeline Streets to relieve traffic conditions at State and Warren Streets, more than a mile away. The refusal of the commission was based on the likelihood that traffic would become congested at the proposed new terminal.

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Recent Bus Developments

Irresponsible Bus Operators in Massachusetts Must Go

Acting under the new law of 1925, which gives it jurisdiction over buses, the Massachusetts Department of Public Utilities has prepared a tentative draft of rules and regulations which will cover all the operations of the passenger-carrying buses in the state. This draft will be submitted to the interested parties for suggestions and criticisms and a public hearing on it will be given at the State House on Feb. 24. In brief, the commission takes control over the licensing of the buses, will require the filing and publishing of rates, will prescribe definite routes for all buses and will require a timetable, just as is done in the case of railroads and electric railways.

Every owner of a bus or buses to be operated in the public ways in Massachusetts, and doing an intrastate business either in whole or in part, will be required to obtain licenses and meet the bond and other requirements of each city and town in which they operate. A permit from the Division of Highways and a certificate of public convenience from the Department of Public Utilities will also be required.

The schedules to be filed must show the regular starting time, the time for passing certain points en route and the time of arrival at the terminal, and the rules say that no schedule shall be provided or maintained which will require unsafe and unreasonable speed. The rules will hold the buses to the schedules and to the defined routes, and if a bus fails to operate for a certain length of time it automatically loses the license.

The rules prescribe dimensions and weight of the buses, the strength of the cars, what the reserve equipment shall be, the degree of maintenance, and the condition of the equipment, types of tires, diagram of gear shifts and hours of service.

The regulations go into the subjects of conduct by the operators, application of the rules and penalties.

The rules will not be put into final form until after the public hearing. They are the first rules proposed for the control of the jitney or bus business in Massachusetts.

Bus Lines in New York City by July 1

Another step in the plan for New York City-wide bus operation was mounted on Feb. 17 when an amicable agreement was reached by the subcommittee of Mayor Walker's transit conference on the bus routes. Speaking for the sub-committee, which includes members of the State Transit Commission and the Board of Transportation, Joseph V. McKee, Aldermanic President, announced his belief that franchises for bus lines in all the boroughs would be awarded by the Board of Estimate within a few weeks so as to give the successful bidders sufficient time to acquire equipment to be placed in service on July 1, the date on which Mr. McKee believes city-wide bus operation can be effectively realized. This belief he announced at the close of a conference held in the City Hall, in which the Board of Transportation was represented by Commissioner Daniel L. Ryan and the Transit Commission by Commissioner LeRoy T. Harkness.

The routes, numbering 55 in four boroughs, will first be presented to the Mayor's transit conference and later to the Board of Estimate for official adoption. The President of the Board of Aldermen said that the routes adopted by the committee followed closely those recommended in the latest report by the Board of Transportation, of which John H. Delaney is chairman, together with the incorporation of certain of the modifying suggestions made by the Borough Presidents for routes in their respective boroughs. He intimated that while it might be found necessary to incorporate in the scheme some minor alteration, the principal features of the routes as suggested by the Board of Transportation had found favor with all in the "get-together" conferences.

With an agreement on routes assured, the question of franchises and general operating policies will be taken up. The problem, in Mr. McKee's opinion, lay in determining upon a policy of awarding borough-wide franchises for the most part or of awarding franchises for only partial borough operation to individual bidders.

Thirty-five-Mile Bus Line Proposed in New York

The Buffalo & Erie Coach Corporation a subsidiary of the Buffalo & Erie Railway, proposes to operate buses between Jamestown and Westfield, N. Y., over a route now served in part by a line of the Chautauqua Traction Company soon to be abandoned by permission of the State Public Service Commission. The proposed line would be 35 miles long. The bus company will apply for franchises at once to the Jamestown Council, it was announced, following a conference on Feb. 8 at Jamestown of citizens, representatives of the Broadhead traction interests and of the Buffalo & Erie Railway. The corporation agrees to carry no local passengers within Jamestown and between Jamestown and Asheville or intermediate points, this territory to be served by the Jamestown Street Railway, a Broadhead Corporation, when the Chautauqua Traction Company ceases operation.

Higher Fares Allowed. — Increased fare schedules have been ordered by the Indiana Public Service Commission for the bus line operated by the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., and a suspension of service was authorized on part of the line where losses have occurred. The new fares are based on a rate of 3 cents a mile.

Buses Suggested for Relief.—The use of buses to supplement the Municipal Railways of St. Petersburg, Fla., was recommended recently to the City Commission by R. E. Ludwig, director of public utilities. Mr. Ludwig advised the purchase of a fleet of buses to relieve street car congestion during the remaining months of the winter. Meanwhile the railway is being extended.

Competing Buses Removed. — Bus competition with the Weston-York Township-Toronto electric railway line operated by the Toronto Transportation Commission has been discontinued by official order as far as buses operating between Weston and Toronto are concerned. However, a bus line giving a service parallel to the railway from Toronto to a short distance outside the city limits continues in operation. The opening up of the Weston-York Township line has been referred to in these pages.

Buses Authorized in Fort Worth.— The City Council of Fort Worth, Tex., has adopted an ordinance by unanimous vote authorizing the Northern Texas Traction Company to operate buses in Fort Worth in connection with its railway system. No restrictions were imposed on the routing of the buses in view of the fact that their operation is an experiment.

Seeks New Bus Franchise. — The United Traction Company, Albany, N. Y., is seeking a franchise from the Albany Common Council to operate a bus line over New Scotland Avenue. An ordinance has been introduced in behalf of the company. The action of the Common Council must be confirmed by the Public Service Commission. The Albany Transit Company, an independent, is seeking a franchise to operate over the same avenue.

Supplementary Service Under Consideration.—The Birmingham Electric Company, Birmingham, Ala., is contemplating the operation of a number of modern passenger buses to supplement its railway service in several sections of the city. One of the proposed lines would run from East Lake to Huffman, replacing the Roebuck car line, while another would extend from Fairview to Bellview Heights. The matter is now being considered by the City Commission.

New Line in Burlington.—The Iowa Southern Utilities Company will start a temporary bus service in the spring following the authorization to establish a bus line in Burlington, Iowa, to supplant the present South Hill street car line. New buses, of the type now used on the Agency and Mount Pleasant-Bluff road lines are to be ordered, John H. Chase, resident manager, announced. It is said no further replacement of street car lines with buses is contemplated at this time. The company will remove its tracks and pay $12,000 in a series of installments to the city for relieving it of the responsibility of replacing the pavement.

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Financial and Corporate

Milwaukee Does Well

$513,110 Increase in Net for 1925—Bus Earnings Represent Substantial Part of Transportation Revenue

Operating revenues of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., from transportation of passengers, freight and express for the year ended Dec. 31, 1925, were $10,615,589, an increase of 2.17 per cent over the year 1924.

Operating revenues of the electric and heating departments were $13,377,063, an increase of 9.92 per cent over 1924.

The percentages of operating revenues of the various utilities appropriated for maintenance and depreciation of physical property were as follows:

	Per Cent
Railway	23.07
Electric light and power	12.34
Heating	17.96

Net income available for the payment of dividends was $2,838,831.

Net capital expenditures for additions to and betterment of property during the year were $4,536,653, after deducting replacements and property withdrawn from service. The principal items have been summarized by the company as follows:

Railway utility	$1,373,212
Electric and heating utilities	1,143,357
Power and miscellaneous	2,020,083

Expenditures in the railway utility include principally the addition of new track at the end of the Vliet Street and First Avenue lines, betterment of approximately 13 miles of track in the city and suburbs of Milwaukee, including heavier type of construction to meet the heavier present-day traffic conditions.

The company acquired a private right-of-way from 35th Street and St. Paul Avenue in a general westerly direction through the Menomonee Valley and the town of Wauwatosa to connect with its present Watertown interurban line at a point just east of the Northwestern belt line crossover in the town of Greenfield. Grading work has been started and some trestle work erected. This improvement, when completed, will permit of a more direct route to the Land O'Lakes over the Waukesha-Oconomowoc-Watertown interurban line and will considerably shorten the schedule running time.

Nineteen new buses were acquired for passenger service on the Wisconsin Motor Bus Lines.

The company purchased a 99-year leasehold and option to purchase on property situated at the southeast corner of Sycamore and Second Streets, directly east and across the street from the Public Service Building. With this acquisition the company now controls a valuable site, which, at present, is being used as a central parking station in connection with the operation of its bus service.

During the year the company continued to obtain a substantial amount of its capital requirements from the sale of preferred stock offered to investors through its securities department.

At a special meeting held Dec. 21, 1925, the stockholders approved the recommendations of the directors that the authorized capital stock be increased from $40,000,000 to $80,000,000, to consist of $40,000,000 preferred capital stock and $40,000,000 common capital stock and that the par value of the common capital stock be changed from $100 a share to $20 a share.

Subject to the approval of the Railroad Commission the directors authorized the issue of $4,000,000 par value of additional 7 per cent preferred stock, of which $700,000 was issued to acquire the capital stock and notes of the Wells Power Company. Of the total amount of $11,000,000 of 7 per cent preferred stock now authorized, $6,896,900 had been issued and was outstanding as at Dec. 31, 1925, and $803,100 par value additional had been subscribed for on the installment plan. The company now has approximately 12,000 holders of its preferred stock, exclusive of subscribers to stock on the installment payment plan.

The only financing done by the company during the year 1925 consisted of the issuance of $1,696,700 par value of 7 per cent preferred stock placed for cash at par. The net additional 7 per cent preferred stock subscribed for under the installment payment plan during the year was $504,800; $150,000 of 5 per cent serial notes matured on July 1, 1925, and were paid; $225,000 of refunding and first mortgage bonds were retired during the year through sinking funds; $6,500,000 of consolidated first mortgage 5 per cent bonds matured on Feb. 1, 1926, and were paid, the cash required therefor having been obtained by the issue and local sale of preferred stock, the purchase of $3,750,000 par value of additional common stock by the North American Edison Company and by cash advanced by the latter company.

At a special meeting held on March 23, 1925, the stockholders voted to accept the "service-at-cost and municipal contract" ordinance passed by the Common Council of the city of Milwaukee on March 2, 1925, and accepted by action of the board of directors of the company on March 9, 1925. This ordinance was approved by the Railroad Commission on March 24, 1925. At the special election held April 7, 1925, the ordinance was defeated by referendum vote of the electorate of the city of Milwaukee and finally rejected.

It is explained that in the transportation revenues of the company there is included a very substantial amount derived from bus operation.

William W. Coleman, Milwaukee, has been elected a director and member of the executive and finance committee to fill the vacancies in these offices created by the death of John I. Beggs, former president of the company.

STATISTICS OF RAILWAY OPERATION AT MILWAUKEE

	1925	1924
Miles of track owned	419.28	418.72
Miles of track leased	1.90	1.56
Miles of revenue track operated	391.49	391.08
Revenue passengers carried	150,591,216	150,857,684
Transfer passengers carried	53,635,554	52,306,065
Per cent transfer to revenue passengers	35.61	34.67
Receipts per revenue passenger	$0.0677	$0.0664
Number of passenger cars owned	861	870
Number of passenger motor buses owned	124	107
Kilowatt station demand (railway and light)	166,200	146,900

INCOME ACCOUNT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

	1925		1924	
Operating revenues		$23,992,653		$22,559,912
Operating Expenses:				
Ordinary operating expenses	$14,415,619		$14,169,176	
Depreciation (reserve credit)	1,847,077		1,627,102	
Taxes	2,160,755		1,757,306	
Total operating expenses		18,423,452		17,553,585
Net operating revenues		$5,569,200		$5,006,327
Non-operating revenues		357,675		252,884
Gross income		$5,926,875		$5,259,211
Interest Charges:				
Interest on funded and unfunded debt	$2,574,457		$2,454,117	
Interest on depreciation reserve balances	471,814		438,978	
Interest on other reserve balances	41,772		40,393	
Total interest charges		$3,088,043		$2,933,489
Net income		$2,838,831		$2,325,721

Gross Off, but Net Larger, in Indianapolis

Gross earnings of the Indianapolis Street Railway, Indianapolis, Ind., in 1925, the first full calendar year in which a 7-cent basic fare prevailed, were $51,806 less than in 1924. This was made plain in a report for the twelve months filed on Feb. 13 with the Indiana Public Service Commission. The gross last year was $5,536,369. The shrinkage is attributed to increased bus competition and a substantial decline in the total number of passengers carried owing to unfavorable industrial conditions experienced for a part of the year.

Despite the lower gross revenue, however, the report shows a net revenue of $487,741 for the year. In 1924 the net revenue was $484,965. Operating expenses were lower last year than in

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EARNINGS OF THE INDIANAPOLIS STREET RAILWAY

	1925	1924
Gross earnings	$5,536,369	$5,588,176
Operating expenses	4,032,821	4,083,749
Net earnings	$1,503,548	$1,504,427
Taxes	$386,624	$384,354
Fixed charges	629,182	635,107
Net revenue	$487,741	$484,965
Sinking fund	$146,566	$130,000
Dividend paid	150,000	300,000
Dividends accrued—not paid	150,000	.....
Total deduction	$446,566	$430,000
Surplus	$41,175	$54,965

1924. Two quarterly dividends during the year were deferred. A condensed statement for the two years is presented in the accompanying table.

Rehabilitation of Detroit United Makes Progress

No financial statement has been issued by the receivers of the Detroit United Railway, Detroit, Mich., for the year 1925. It is probable that some report will be made to the creditors, but the stockholders do not now figure to any extent since their failure to finance the reorganization. Reports have been made for various committees, including those representing the bondholders, but no complete financial report has been issued. Progress in rehabilitating the system is reported by the Security Trust Company, Detroit, receiver. Economies in operation are being effected, but no prophecies are made about the outcome. Rumors of reorganization plans are heard, but nothing definite has materialized.

Another St. Louis Reorganization Move

Rolla Wells, receiver of the United Railways, St. Louis, Mo., on Feb. 13 applied to the United States District Court for permission to enter into a contract with the reorganization committee for the railway whereby $4,200,000 of receiver's certificates will be paid in full in cash and $4,100,000 of underlying bonds will be exchanged for general 4 per cent bonds.

The plan is to have the receiver pay $2,300,000 in cash and the reorganization committee $1,900,000 to take up the receiver's certificates. The underlying bonds would be surrendered by the present holders in exchange for 4 per cent bonds. The reorganization committee would receive $6,000,000 in general 4s for its cash and the underlying bonds to be taken up. There are now outstanding $30,300,000 of the general 4s.

The question of issuing the $6,000,000 of additional general 4s held up the reorganization of the company. There was a serious question about exchanging the underlying bonds for general 4s, but Sam Mitchell, counsel for the bondholders of the St. Louis Transit Company, recently told the court that this objection had been removed. The application of Mr. Wells substantiates Mr. Mitchell's statement. It also indicates that the railway properties will shortly be foreclosed under the $9,790,000 transit bond issue.

The receiver regards it as for the best interest of the company that an early reorganization be brought about and adds that a plan for a friendly foreclosure under the transit company 5 per cent mortgage has been arranged by financial interests of the company.

Outstanding underying bonds due since Oct. 1, 1923, include $1,474,000 of Lindell Railway, $1,640,000 of Cass Avenue & Fairgrounds and $986,000 of Merchants Terminal Railroad.

Disposition of Ohio Interurban Undecided

Sale of the electric light and power properties of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, to the Cleveland Electric Illuminating Company, noted in the ELECTRIC RAILWAY JOURNAL for Jan. 23, page 174, naturally provoked questions about the probable disposition of the railway. It is understood now that this is a matter still to be decided. It will probably not work itself out until later. The electric light and power service was the more profitable of the two operations of the company. Since this end of the business has been sold it will remain for future developments to determine whether or not the railway service is to be continued. The railway operates 38 miles of track.

Commission Authorizes 13 Miles Abandoned in Chautauqua

The Public Service Commission on Feb. 5 authorized the Chautauqua Traction Company to abandon that part of its route between Ashville and Mayville, Chautauqua County, a distance of 13.4 miles. Two short sections of track of this company are to be retained, one section, from Lakewood to Ashville, being transferred to the Jamestown Street Railway and the other, in the village of Westfield, being transferred to the Jamestown, Westfield & Northwestern Railroad. The opinion of Commissioner Pooley, who heard the case, points out that the road has sustained substantial losses in every year since 1909, and it has not earned operating expenses in any year since 1918.

He said further that in the last abandonment proceeding it was claimed that the interests controlling both the Chautauqua Traction Company and the Jamestown, Westfield & Northwestern Railroad were diverting business from the traction company to the railroad, and while this claim was not made in this proceeding, the commission was in receipt of communications to that effect, with the intimation also that these companies were not receiving all revenues to which they were entitled by reason of the issuing of passes for free transportation to various persons. The commission has considered the facts and the evidence taken shows that the railroad has not been, and is not, earning its fixed charges; the deficit for the past two years being approximately $50,000 a year. As to free transportation it was shown that at the time the properties came under the control of the representatives of the estates of Messrs. A. N. and S. B. Broadhead, 120 passes were outstanding. This number has since been reduced to 40, and passes have been strictly confined to those who may receive them under the statute.

Syndicate May Purchase West Milton Line

A syndicate composed of residents and shippers living along its route is being organized to purchase the Dayton, Covington & Piqua Traction Company, West Milton, Ohio. The line was offered at a receiver's sale recently and no bids were made. The lowest bid possible for the line, which is 30 miles long, was fixed at $150,000. The syndicate, it was said, contemplates making arrangements with the special master in the receivership, and a new minimum rate may be set. Sale of the line must be approved by Federal Judge Smith Hickenlooper of the Southern district of Ohio before the sale can be consumated.

The commission authorized abandonment of the line a few months ago. In its petition for abandonment the company declared it had been operating at a loss due to automobiles and buses cutting down the patronage.

Receivers Sought for Rockford Properties

Suit for the appointment of a receiver for the Rockford & Interurban Railway and the Rockford City Traction Company, Rockford, Ill., because of non-payment of interest on bonds, has been filed by trustees on demand of the bondholders. The Union Railway, Gas & Electric Company is named a party to the bill. The petitioner is the Continental & Commercial Trust & Savings Bank, Chicago, trustees. The petition is returnable to the April term of court.

The two lines are subject to liens secured by bonds to the amount of $1,650,000. The first issue was in 1902 of $800,000 for construction of the railway and a further issue of $1,459,000 was made for equipment. From earnings, $574,000 bonds were purchased and set aside from time to time as a sinking fund. The entire issue was payable on Oct. 1, 1922, but an extension was arranged until Oct. 1, 1930, all holders, except those whose bonds totaled $32,000, accepting.

At that time, to prevent foreclosure proceedings and the loss of $400,000 of notes held against the company for equipment, the Union Railway, Gas & Electric pledged certain securities. These included notes for $83,675 and an open account for $374,857. Under the agreement for the extension, provision was made for annulment in case the company, as a party to it, did not pay the interest on the bonds. Payments were made until April, 1925, but in October of that year payment was again passed.

The Continental & Commercial Trust & Savings Bank, which is bringing action, has resigned as trustee for holders of the bonds against the interurban lines. The company, however, is still trustee for a $1,650,000 bond issue. In the name of the holders of these

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bonds it is instituting the action. The bonds, originally issued to cover local properties and the Belvidere interurban line, also are a lien against the Rockford & Freeport and Rockford, Beloit & Janesville lines to the amount of $1,250,000, but no action is instituted in this case.

$99,929 Surplus at Pittsburgh

For the year recently closed the Pittsburgh Railways, Pittsburgh, Pa., reports a surplus of $99,929. Car riders last year paid an average of 5.77 cents for each ride, according to the railway. This compares with 6.62 cents as average fare for 1924. Weekly, Sunday and holiday passes were largely responsible for this reduction, and in the closing months of 1925 the average fare received was almost 29 per cent less than that for the same period the preceding year.

$1,700,000 in P. R. T. Certificates

Equipment trust certificates of the Philadelphia Rapid Transit Company, Philadelphia, Pa., to the amount of $1,700,000, bearing interest at 5 per cent and priced to yield about 4.75 to 5.35 per cent, are being offered by Dillon, Read & Company, New York. These certificates, known as equipment trust, series J, are issued under the Philadelphia plan and will mature in equal annual installments from Feb. 15, 1927, to Feb. 15, 1936. The purpose of the issue is to pay in part for new equipment to be constructed at a total of not less than $2,283,750. The equipment includes 50 standard double-truck vestibule street railway passenger cars, 75 double-deck motor coaches and 60 single-deck motor coaches. The par value of the certificates will represent less than 75 per cent of the cash cost of the equipment. Some facts about this equipment were given in the ELECTRIC RAILWAY JOURNAL, issues of Feb. 6 and Feb. 13.

Long Island Lines to Be Sold

The New York & Long Island Traction Company, New York, N. Y., will be sold at public auction at the County Court House at Mineola, L. I., on Feb. 25, following a ruling of the Supreme Court of Nassau County in pursuance of a judgment of foreclosure and sale brought by the Union Trust Company as trustee plaintiff. The property will be sold in five parcels, including franchises, rolling stock, real estate and certain trackage rights and personal property. The sale will also include the Long Island Electric Railway, which company is also controlled by the Long Island Consolidated Electric Companies. George Le Boutillier, vice-president of the Long Island Railroad, recently announced that the notice of the sale of these companies meant that operation of cars on both lines would be discontinued. The New York & Long Island Traction Compnay operated 41 miles of line, connecting Mineola, Garden City, Freeport and other important points on Long Island and the Long Island Electric operated 25 miles of line connecting Brooklyn and Far Rockaway.

Suit to Hold Up Seattle-Rainier Sale

Fight by Rainier Valley residents to block a referendum vote on the purchase by the city of the Seattle & Rainier Valley Railway was delayed in the Superior Court, when Judge Malcolm Douglas granted the motion of Arthur Schramm, assistant corporation counsel, for a continuance of the hearing on the show cause order issued against City Comptroller Harry W. Carroll. Judge Douglas did not set a definite time for the hearing.

Even if the court action had not been brought, the referendum could not go before the voters at the March 9 election owing to the legal requirement that its validity must be certified 45 days before a regular election. When the referendum is submitted to popular vote, if such proves to be the case, it must be at a special election.

Rainier Valley residents obtained a temporary restraining order preventing the City Comptroller from certifying the petitions to the City Council and restraining the making of a report on the petitions to the Council. The opponents of the referendum proposed assert that the petitions are illegal, that only the petitions which were filed on Dec. 26 and which contained only approximately 4,000 signatures are legal.

Quarterly Earning Statements in Philadelphia. — The income account statement of the Philadelphia Rapid Transit Company, Philadelphia, Pa., heretofore prepared and printed monthly for the information of stockholders, will hereafter be issued quarterly to coincide with the dividend period on P.R.T. common stock. The next income account statement will accordingly be issued during April for the first three months of 1926.

Deficit in 1925.—For the year ended Dec. 31, 1925, the gross income of the Portland Railroad, leased by the Cumberland County Power & Light Company, of Portland, Me., was $1,451,902, against $1,582,264 in 1924. The operating expenses and taxes for 1925 were $1,178,574, against $1,294,781 the year previous. The net income was $25,730 in 1925, against $39,885 in 1924. After the consideration of dividends, which for both years amounted to $99,950, operation in 1925 resulted in a deficit of $74,220, against a deficit of $60,065 in 1924.

Judgment of $110,535 Against Urbana Line.—Settlement of the affairs of the Kankakee & Urbana Traction Company, Urbana, Ill., is progressing rapidly. Judge Smith recently approved the report of the master, without objection, entering judgment for $110,535 against the road and directing its immediate and absolute sale. The date, however, has not yet been set. T. B. Webber, vice-president and secretary of the line, was recently appointed receiver. The property includes trackage and right-of-way from Urbana to Paxton, four cars and a station at Rantoul.

Loan Authorized.—The Indiana Public Service Commission recently approved a petition of the Hammond, Whiting & East Chicago Railway, Hammond, Ind., to negotiate a $20,000 loan and to issue three notes of $24,766 each. The notes will be taken by the Chicago City & Connecting Railways collateral trust. They represent a refunding of the unpaid balance of money advanced to the issuing company in 1918 by the United States Housing Corporation to extend lines and to buy new equipment for increased service to factories engaged in war work.

Business of Railway Concluded.—A decree approving the findings of the receiver in the case of the Alamance Railway and ordering distribution of funds was received recently to be filed in the office of the clerk of the Western North Carolina District Court at Greensboro, N. C. The decree is concerned with the winding up of the affairs of the company and distribution of funds to the bondholders, for whom the American Trust Company, Richmond, Va., is acting. The Alamance Railway formerly operated a street railway system in Burlington and Alamance and between these two towns. Cars have not been run for several years.

Net Income in Worcester, $349,735.—The net income of the Worcester Consolidated Street Railway, Worcester, Mass., for the year ended Dec. 31, 1925, was $349,735, or $7.77 a share, compared with $362,504, or $8.05 a share, in the preceding year. As of Dec. 31, 1925, current assets were $1,208,420 and current liabilities $569,129, leaving net working capital of $639,291. For the quarter ended Dec. 31, 1925, net income was $223,895 after charges, equivalent to $4.97 a share on the 45,000 shares of capital stock outstanding, compared with $53,144, or $1.18 a share, in the corresponding quarter in 1924.

May Discontinue Electric Line.—Contending the service is being operated at a loss of $5,000 a month, the Missouri Pacific Railroad contemplates the discontinuance of the Coal Belt Electric Railway, Marion, Ill. It is reported attorneys for the railroad are preparing briefs to present their case before the Illinois Commerce Commission to discontinue the service. The Coal Belt Electric Railway, operated by the Missouri Pacific, a steam road, is 14 miles long, extending through Marion, Herrin, Carterville and Energy.

Easements Should Be Included in Valuation.—An opinion has been given the Maryland Public Service Commission by Thomas H Robinson, Attorney-General of Maryland, holding that easements should be included in the commission's valuation of the property of the United Railways & Electric Company, Baltimore. Following shortly after the ruling the United made an announcement that no matter what valuation was placed on the property there would be no increase in fares. The present fare is 7½ cents. During the hearings Clarence W. Miles, people's counsel, said that if easements were included it was probable that he would take the case into the courts. Before the commission took any action it sought the opinion of the Attorney-General. Mr. Miles will make a close study of the ruling before he decides what action to take. The United placed a valuation of almost $18,000,000 on easements during the hearing.

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Personal Items

John H. Hanna President Capital Traction

Chief Operation Official of Washington Property Made Executive Head of the Company

John H. Hanna, vice-president in charge of operations of the Capital Traction Company, Washington, D. C., for the last ten years, has been elected president to fill the vacancy created by the resignation of George E. Hamilton. His advancement will become effective on March 11, the date of Mr. Hamilton's resignation.

It has, indeed, been a strong combination of talent, this association of Mr. Hamilton and Mr. Hanna on the Washington property. George E. Hamilton knows finance and the law as

J. H. Hanna

few other men do. Equally as much can be said of Mr. Hanna about his familiarity with engineering and his knowledge of transportation. Under the new arrangement of personnel the responsibilities of the two men are readjusted, but the association remains, for, as explained elsewhere in this issue, Mr. Hamilton continues as chairman of the executive committee.

George E. Hamilton makes no pretensions to being a street railway man as that term is generally applied. Neither does Jack Hanna, for that matter. No man, however, can escape the estimate put upon him by his contemporaries. In the case of Jack Hanna that estimate places him well up at the top, if not actually at the top. For 32 years now he has served the one company, a company that reflects, more than do many others, the ideas and ideals of a single officer, now made its head. If ever a property were well kept up, it is the Capital Traction. Remember, too, that it is an underground conduit road. As for the cars, they are the last word in both appurtenances and appearances. Jack Hanna was one of the first men in the industry fully to appreciate the pulling power of paint with the public. He is more than an operator—he is a pioneer. As one instance of this there is the use under his direction of the bus in de luxe service to Chevy Chase, treated in the ELECTRIC RAILWAY JOURNAL for Feb. 13.

It has not all been operation with which Mr. Hanna has had to deal in Washington. Legislators down there may be remiss about other things, but they never lose sight of the fact that Washington is the nation's capital. Civic spirit knows no limit. This is commendable, but it is also distressing at times. Commissions have a say in everything, for there is no elected government. It is in just such situations that Jack Hanna is a diplomat among diplomats. His public relations are of the very best. He is well known and well liked, two things that appear always to go together but do not always do so. With the boys of the district Jack Hanna is aces high, as they say. He is a member of the executive committee of the Washington Council of the Boy Scouts. As a matter of fact, there is not much that is planned for this organization in which Mr. Hanna does not take a hand.

Relation of this particular activity of the man may appear to be far removed from railway operation. It is. But every man is a composite. Few live by bread alone. Jack Hanna likes to fish and he likes to play golf. One of these predilections testifies to the ability of the man to amuse himself when thrown upon his own resources—a great test in this age—and the second testifies to the ability of the man to amuse himself when thrown on somebody else's resources.

Mr. Hanna has long been active in affairs of the American Electric Railway Association. He was president of the Engineering Association 1913-1914, and in addition to being a member of the executive committee in 1925 he had a prominent part in tre work of many other committees. Included among these were the 1925 committee of the mid-year meeting and dinner arrangements, of which he was chairman, the committee on national relations and the committee on subjects and meetings. He was the association's national councilor to the United States Chamber of Commerce. This year he is a member of the executive committee and chairman of its membership committee and chairman of the sub-committee of the national relations committee on depreciation.

After leaving college Mr. Hanna engaged in steam railroad engineering work and then entered the service of the Washington & Georgetown Railroad, predecessor of the present traction company. The following year he was appointed assistant superintendent and four years later became superintendent and assistant engineer of the company. In 1909 he was appointed chief engineer in charge of all construction and maintenance. Then in 1916 he became vice-president.

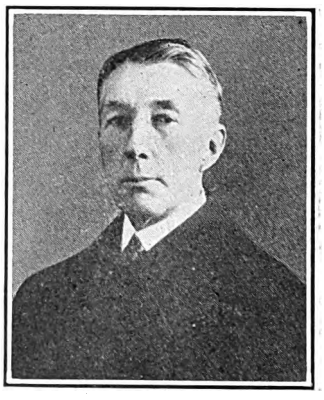
Mr. Hanna was born in Henderson, Ky., in 1871. He acquired his early education in the high and private schools of his home town, and was graduated from Princeton in 1892 with the degree of civil engineer.

C. C. Castle in New Post

Executive Well Known in Equipment Field Joins New American Car & Foundry Motors

C. C. Castle will become actively associated with the American Car & Foundry Motors Corporation on April 1. At that time he will sever the business affiliation with B. A. Hegeman, Jr., which has extended over a long period. For years one of the most outstanding figures in the railway field, Mr. Castle will carry to his new association an enormous amount of prestige and of good will. The name Charlie Castle is a byword on the lips of both old timers and newcomers alike in the industry.

He has been associated with Mr.



C. C. Castle

Hegeman ever since May, 1910, and the milestone of each passing year has testified mutely to the progressive activity of that well-known partnership. As first vice-president of the National Railway Appliance Company, vice-president of the Hegeman-Castle Corporation, vice-president of the Anglo-American Varnish Company and one time vice-president of the Genesco Corporation, Rochester, N. Y., the force of Mr. Castle's personality has long made itself felt. Lately, the press of duties has made it impossible for him to continue as vice-president of the Genesco Corporation and he accordingly resigned from that office and became the secretary of the corporation.

Mr. Castle has for years taken an active interest in the affairs of the electric railway industry. While the American Electric Railway Manufacturers Association was still in existence, he served as president of that organization. He is a manufacturing member of the executive committee of the Railway Supply Manufacturers Association, a member of the finance committee of the New York Railroad Club and a member of the New England Street Railway Club. He belongs to the Railway Club of New York and is a member

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of the admissions committee of the Lotos Club of New York.

Prior to his association with Mr. Hegeman, Charlie Castle was vice-president of the Hildreth Varnish Company. In fact, these have been the two principal business affiliations of his long and active career. He was born in Syracuse, N. Y., on a date known only to himself. He early exhibited a penchant for railway affairs. At the age of sixteen he entered the employ of the Merchants Dispatch Transportation Company, Syracuse, N. Y. After a brief period spent in this work, he became attached to the Sherwin-Williams Company and remained with that company for approximately three years. Then came an offer of an opening with the Hildreth Varnish Company and the growth of his extraordinarily wide acquaintanceship throughout the railway field.

R. J. Ritchie Advanced by Fitkin Interests

Ralph J. Ritchie, operating vice-president of the Jersey Central Power & Light Company, southern division, has been transferred to the New York office as operating manager of Fitkin Utilities under the management of the General Engineering & Management Corporation.

Mr. Ritchie's new assignment is a promotion for meritorious service. To him was assigned the difficult task of consolidating the various properties which now comprise the Jersey Central southern group. He had been a year and a half in the territory.

As operating manager Mr. Ritchie will have reporting to him the supervisors of the group divisions of Fitkin utilities.

George E. Hamilton Resigns at Washington

George E. Hamilton has resigned as president of the Capital Traction Company, Washington, D. C., effective March 11, which will be the eighteenth anniversary of his election to that office. His resignation was presented at a meeting of the board of directors on Feb. 11. It was accepted with the understanding that he would continue to serve the company as general counsel and as chairman of the executive committee. Mr. Hamilton gave as his reason for resigning his desire to devote more time to professional employment and personal matters.

When Mr. Hamilton took over the presidency of the Capital Traction Company in 1908 he succeeded the late George P. Dunlop. Mr. Hamilton continued, however, as senior member of the low firm of Hamilton, Colbert, Yerkes & Hamilton. Prior to his assuming the presidency of the company he was a director and legal representative in Washington City of the Baltimore & Ohio Railroad and lecturer on wills and legal ethics in the Georgetown Law School, of which he was formerly dean.

In his official resignation he said the eighteen years of his official life had been "eventful ones in the history of our company—years filled with difficulties overcome, dangers avoided and with fair accomplishment in a safe and useful direction."

W. H. Kennedy Auditor for Chicago Surface Lines

W. H. Kennedy has been appointed auditor of the Chicago Surface Lines, succeeding J. J. Duck, resigned. R. E. Eddy has been promoted from the position of auditor of receipts, which he has held for the past six years, to the position of assistant auditor.

Mr. Kennedy went to the Chicago property from the Western United Corporation at Aurora. Previous to that he was for five years assistant treasurer of the Savannah Electric & Power Company, Savannah, Ga. He has been connected with Stone & Webster properties for 25 years, serving, in addition to those mentioned, with the Lowell Electric Light Corporation, Lowell, Mass.; Edison Electric Illuminating Company, Brockton, Mass.; Electric Light & Power Company, North Abington, Mass.; Cape Breton Electric Company, Sydney, N. S.; Keokuk Electric Company, Keokuk, Iowa, and the Houghton County properties, Houghton, Mich.

W. H. Kennedy

Previous to his Chicago connections Mr. Eddy served with so-called Hodenpyl-Hardy companies, including the Springfield Consolidated Railway and the Springfield Gas Company, Springfield, Ill., of which he was assistant secretary; Kalamazoo Gas Company, Michigan Light Company and Consumers' Power Company at Kalamazoo, Mich.

R. E. Eddy

The positions of general auditor, auditor of receipts and auditor of disbursements, the latter held by I. C. Shellenberger, have been discontinued by the Surface Lines.

It is understood that Mr. Duck's status with the Chicago City Railway remains unchanged.

"Pop" Shepherd's Record

Versatile Employee of New Jersey Road in Service Thirty-five Years

Look to your laurels, men in electric railway work who pride yourselves on your records of continuous service in the industry! William H. Shepherd, Jersey City, doesn't actually challenge you, but his record is attracting much attention in New Jersey. Thirty-five years in the railway business with Public Service Railway and predecessor companies—that's the record of Mr. Shepherd. He started Jan. 9, 1891, as a conductor in Jersey City on the Erie Street horse car line of the Jersey City & Bergen Railway, and he is now assistant to the general superintendent of Public Service Railway.

Working as a conductor on various lines of the Jersey City & Bergen Railway and later the Consolidated Traction Company until 1894, Mr. Shepherd was then appointed an inspector. Subsequently, he was starter at various carhouses in Jersey City for the Consolidated Traction and the North Jersey Railway. When the Public Service Railway started in 1903 Mr. Shepherd took a position in the employment office in Hoboken, later was a clerk in the Hudson Division office and in 1904 was transferred to the time-table department. The headquarters of the company were moved to Newark that year and Mr. Shepherd went along to take a position in the passenger agent's department, soliciting special car business. The following year he was transferred back to the time-table department, also in Newark, and remained there until 1923, when he was appointed to his present position. Mr. Shepherd started in the time-table department as a clerk and rose to the position of assistant superintendent of the department.

Popularly known among the trolleymen as "Pop," Mr. Shepherd organized the Public Service Railway Athletic Association and was active in promoting track and field sports, baseball leagues and pool tournaments. The first annual outdoor meet of the association was held in 1912 at Hilton oval, near Newark, and an indoor track meet was held in the Fourth Regiment Armory, Jersey City, the same year. His own ability as an athlete qualified him for this work. In those days he wore the silks of the Scottish-American A. C. Later he joined the Wayne A. C. and gradually changed from distance runner to sprinter, hurdler and jumper. His best mark for the 100-yard dash was 10.1; for the standing broad jump, 10 ft. 3 in., and the standing high jump, 4 ft. 11 in., the latter two marks being made indoors.

As an indication of the popularity of Mr. Shepherd with the rank and file in Public Service Railway, it is recalled

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that in 1915, when a New York newspaper conducted a contest to determine the most popular railway man in the Metropolitan district, Mr. Shepherd not only won first prize—a trip to the San Francisco Exposition, with all expenses paid—but, through the loyal support of the trolley men of the Public Service he polled 3,000,000 votes, beating his nearest competitor by almost 1,000,000.

Mr. Shepherd is a member of the veterans' organization of the Fourth New Jersey Infantry. He was a captain in the Fourth Infantry on the border during the Mexican trouble in 1916, and among his treasures is a watch fob given him by the enlisted men of his command, a further proof of the high esteem in which he is generally held.

W. L. Briar Made Shop Supervisor at Kansas City

W. L. Briar has been appointed shop supervisor of the Kansas City Railways, Kansas City, Mo., reporting direct to R. S. Neal, assistant superintendent of equipment. All shop foremen now report to Mr. Briar. To correlate the shop and division mechanical work, all division foremen report to Mr. Briar on all mechanical repairs and replacements. Reports, records, etc., are handled through the office of the assistant superintendent of equipment, with materials handled through the office of supervisor of materials.

Dean W. Flowers, formerly general superintendent for the St. Paul Gas Light Company, has joined the engineering staff of the American Light & Traction Company in San Antonio, Tex. That company at one time controlled the St. Paul Gas Light Company and now owns the San Antonio Public Service Company and other utility organizations.

H. G. Milson has been appointed director of personnel of the Toronto Transportation Commission, Toronto, Canada, replacing Dr. S. G. Mills, who has returned to private practice. W. H. C. Seeley, who served for some time as assistant to Dr. Mills, has been appointed assistant director of personnel.

Henri Camp, general secretary of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles, has resigned to engage in business. The executive committee of the association, which is made up of electric railways and bus lines in western Europe, has appointed in his place André de Backer, engineer. Mr. de Backer's appointment dates from Jan. 1, 1926.

Paul Kayser, widely known in newspaper and business circles in Wisconsin, has joined the staff of the Milwaukee Electric Railway & Light Company to take charge of publicity work.

J. M. Markham, general agent of the Northwestern Mutual Life Insurance Company, has been elected president of the City Railway, Dayton, Ohio, succeeding Valentine Winters, who served as president since 1921 and has also been a member of the board for years. Mr. Markham accepted the nomination of the board only under condition that the position be an honorary one and that it carry no compensation. Heretofore the office of president carried a salary of $15,000 a year.

F. P. Snyder General Manager of Oakwood Street Railway

Fred P. Snyder has been appointed general manager of the Oakwood Street Railway, one of the five railway companies entering the city limits of Dayton, Ohio. In announcing his appointment directors of the company said that his experience made him the logical man for the position. Mr. Synder was appointed superintendent of transportation and equipment of the Oakwood Street Railway a few years ago, after several years in charge of the shops. For many years prior to his association with the railway he was associated with the Barney & Smith Car Company, Dayton. He brought to his railway position a thorough knowledge of car building, maintenance of rolling stock and technical data on electric transportation.

F. P. Snyder

Ed Crawford was recently elected secretary-treasurer of the Shreveport Railways, Shreveport, La. Mr. Crawford is the son of the late Captain Crawford, who was vice-president of the company and one of the pioneers in the Southern transportation field. Captain Crawford was succeeded by Ed Jacobs.

Obituary

Donald McColl

Donald McColl, formerly general manager of the Shanghai Electric Tramways, Shanghai, China, died recently at Seaford, England. For a number of years he was connected with the Glasgow Corporation Tramways, but he left that position to go to Lisbon to become traffic superintendent and chief accountant of the tramways there. Later he returned to England and assumed the position of general assistant to his old Glasgow chief, the late John Young, who at that time was general manager of the London Underground Railways. Mr. McColl took part in the electrification and reorganization of the Metropolitan District Railway, and in the starting and development of three new tube railways in London. In 1908 he was appointed to the Shanghai tramways, owned by a British company. Under his management the tramways there were developed and transformed into a profitable undertaking. Mr. McColl was the author of a standard work on tramway bookkeeping and accounts.

Thomas E. Leahey, superintendent of the line department of the Public Service Railway, Newark, N. J., is dead. He was 59 years of age. Mr. Leahey entered the street railway field in 1889, when he became a lineman for the Newark Passenger Railway, one of the predecessors of the Public Service. When the several street railways merged to form the present traction company Mr. Leahey remained as an employee of the new corporation.

Anthony B. Calvin, well known as an attorney, at Youngstown, Ohio, died from heart disease on Feb. 7. For many years Judge Calvin was counsel for the Youngstown & Suburban Railway. He was born in Mahoning County on March 13, 1877, grew up on his father's farm and was educated in the district schools of the county. He was graduated from Northeastern Ohio Normal College at Canfield in 1897 and in 1900 from the law school of Ohio State University. Following this, he was admitted to the bar and had practiced his profession in Youngstown since that time.

David T. Goff, general roadmaster of the Southern Ohio Public Service Company, Columbus, Ohio, died recently at his home in Newark, Ohio. He had been associated with electric railways from the time of the first interurban lines in Ohio. He helped in the construction of the city lines in Newark and Zanesville and interurban lines connecting Columbus, Newark and Zanesville. With the exception of seven years during which he served as a motorman with the Ohio Electric Railway, he has been in the construction and maintenance of way department of the Ohio Electric Railway and its successor the Columbus, Newark & Zanesville Electric Railway and later the Southern Ohio Public Service Company. He was 64 years old.

Carter Miller, advertising manager of the Timken Roller Bearing Company, Canton, Ohio, is dead. Mr. Miller went with the Timken Company six years ago and was promoted rapidly to various positions both in the field with the Timken Roller Bearing Service & Sales Company and at the home office with the Timken Roller Bearing Company. Later he was placed in charge of the advertising department. Mr. Miller was born in Bay City, Mich. He attended the elementary schools in that city and was graduated from Kenyon College at Gambier, Ohio, in 1919. In the business world he was recognized as a keen analyst of advertising and business problems. His advice and counsel were frequently sought in a consulting capacity in matters connected with advertising and in solving publicity problems.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Oil Men Have Their Say

A Material Stiffening of Prices Is Anticipated—More Uniform Production for the Future

Characterizing as mere propaganda for big advances in prices the statements that the petroleum reserves of the country are in immediate danger of being exhausted, an official of one of the larger oil producing companies declared that such an eventuality need not be looked for now or in the near future. What the industry needs more than anything else at the present time, in his opinion, is a movement toward permanent stabilization of prices and production. The disastrous slumps in oil and gasoline prices and the periods of inordinate profits are alike unjustified.

This applies with telling force in the case of the railways. Whether oils are purchased on a basis of the gallon or on the basis of mileage, it is undesirable to be subjected to heavy fluctuations from one year to the next. The stabilized basis for prices will be arrived at only when all of the larger companies in the field have seen the light and have called off their respective entrants from the "industrial dog fight."

Prices, under this new order of things, will not be low. However, the quality of oils sold will average considerably higher and the various grades will be more uniformly standardized. It is often the case, at present, that an operator using a certain grade of oil will find enormous variations from one delivery to the next. This does not make for economical operation and for proper maintenance procedure. The distributing oil companies cannot be entirely blamed for such a condition at the present time, since the oils are obtained from such widely divergent spots and are produced under varying conditions.

This condition was mentioned by one official as an argument for a monopolistic control of the industry. Only under such an arrangement, he feels, can the shoestring operator be excluded, along with his production of oils of doubtful quality. Whether or not the companies which exercised this control would be content to allow prices to remain at a reasonable level is open to conjecture. However, in a free country, there is nothing to prevent the entrance of outside capital into drilling ventures, in case the leaders become unduly obstreperous in handling the situation.

Two are not one as yet, since one company is predicting an immediate stiffening of prices on both oils and gasoline, while another cannot see any prospect of such a move in the near future. The weight of opinion seems to favor the former view, however, although no one apparently anticipates a major advance within the next few months.

Oil companies are looking with considerable interest upon the ever-increasing adoption of co-ordinated bus and trolley service by the railways. Since the oils used in buses are of a much higher quality than the grades required for street car operation and, further, since buses require vastly larger quantities of oil than do their adopted cousins, the cars, it is quite natural that this new business should look very tempting to the producing companies. While the exigencies of bus lubrication are very complex, as compared with the trolleys, and require much careful study so that they may be properly handled, great strides have been and are being made in this direction.

S. M. Curwen Heads J. G. Brill Company—Other Officers

At an organization meeting of the board of directors of the J. G. Brill Company, Philadelphia, Pa., held on Feb. 11, the following officers were elected: President, Samuel M. Curwen; vice-president, James W. Rawle; treasurer, Edward P. Rawle; secretary, Edmund L. Oerter.

H. W. Wolff, vice-president of the American Car & Foundry Company, was elected a director to fill the unexpired term of Stephen J. Simon, resigned. The selection of Mr. Wolff gives the American Car & Foundry Company five of the nine members of the J. G. Brill Company board. This is in line with the recent formation of the Brill Corporation, a merger on the J. G. Brill Company and American Car & Foundry Company's motor subsidiaries. The Brill Corporation is controlled by American Car & Foundry.

The present personnel of the J. G. Brill Company board is as follows: Samuel M. Curwen, E. P. Rawle, Francis A. Lewis, W. Clarke Mason, W. H. Woodin, W. M. Hager, C. S. Sale, W. C. Dickerman, H. W. Wolff.

Electric Locomotives Now Completely Built in Japan

Japan is making rapid strides in the development of her home industries. As an illustration of this comes the announcement that the Kawasaki Shipbuilding Yard is now manufacturing electric locomotives for use on Japanese railroads. These machines are claimed by the makers to be purely Japanese in all materials, no parts having been imported for use in their erection.

In August last the yard received an order for four 25-ton electric locomotives from the Nippon Denryoku K. K. Two of these were delivered in December and the remaining two are now under process of construction. In addition orders are on hand for twelve units ranging from 41 tons to 73 tons. These will be delivered to various railways in the country, the largest order, for five 55-ton locomotives, going to the Fuji-Minobu Railway.

ELECTRIC RAILWAY MATERIAL PRICES—Feb. 16, 1926

Metals—New York

Copper, electrolytic, cents per lb.	14.275
Lead, cents per lb.	9.125
Nickel, cents per lb.	35 00
Zinc, cents per lb.	7 875
Tin, Straits, cents per lb.	64.25
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56 00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$5.00
Somerset mine run, Boston	2 30
Pittsburgh mine run, Pittsburgh	2.05
Franklin, Ill., screenings, Chicago	1.575
Central, Ill., screenings, Chicago	1.125
Kansas screenings, Kansas City	2.30

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.25
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.25
Sheet iron, galvanized (28 gage), cents per lb.	4.50
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.*	11.70
White lead in oil (100 lb. keg), cents per lb.	15.50
Turpentine (bbl. lots), per gal.	$0.97
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4-6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	17.75

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.875
Light copper, cents per lb.	10 00
Heavy brass, cents per lb.	7.375
Zinc, old scrap, cents per lb.	4 75
Lead, cents per lb. (heavy)	7 625
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	17 25
Rails (short), Chicago, gross ton	17 75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	9.00

*The method of selling linseed oil on a gallon basis has been changed and all sellers now quote on a pound basis.

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Data on New Equipment for South Bend

Specifications on a considerable number of cars and electric locomotives ordered some time ago by the Chicago, South Shore & South Bend Railroad, Chicago, Ill., have just become available. This road, now an Insull property, has embarked upon an extensive campaign of modernization and the new rolling stock, which is detailed here, constitutes an important move in this program.

Regular passenger equipment ordered consists of ten combination baggage and passenger motor cars seating 44; six cars with inclosed smoking compartments, seating 48, and nine passenger cars without special modifications, seating 56. These cars are being built by Pullman Company. They were ordered on Aug. 1, 1925, for delivery on June 1 of this year. The specifications follow:

Seating capacity	56
Weights:	
Car body	62,500 lb.
Trucks	32,000 lb.
Equipment	25,500 lb.
Total	120,000 lb.
Bolster centers, length	38 ft. 0 in.
Length over all	60 ft. 0 in.
Truck wheelbase	7 ft. 0 in.
Width over all	9 ft. 9½ in.
Height, rail to trolley base	14 ft. 4⅜ in.
Body	Steel
Interior trim	Mahogany
Headlining	Steel
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Standard Steel, heat treated
Car signal system	Faraday single stroke bell
Car trimmings	Adams & Westlake
Side bearings	Stucki
Compressors	D-3-F
Control	Westinghouse
Couplers	Tomlinson
Curtain fixtures	Railway Curtain Supply
Curtain material	Pantasote
Destination signs	Electric Service Supplies
Gears and pinions	Nuttall
Hand brakes	Peacock
Heater equipment	Peter Smith and Railway Utility
Headlights	Electric Service Supplies
Journal boxes	Symington
Lightning arresters	Westinghouse
Motors	Four Westinghouse No. 567-C-7, inside hung
Paint	Chicago Varnish
Sanders	Ohio Brass
Sash fixtures	O. M. Edwards
Seats	Hale-Kilburn
Seating material	Chase Frieze Plush, grade C
Slack adjuster	Westinghouse
Springs	Baldwin Locomotive Works
Step treads	Stanwood self-clearing
Trolley base	Westinghouse
Trolley shoes	Miller
Trucks	Baldwin
Ventilators	Railway Utility
Wheels	Steel, 36 in. A. R. A.
Special devices	One Westinghouse pantograph per car

Special rolling stock ordered includes two parlor-observation trailers with seating capacities of 21 and two dining car trailers seating 24 passengers. These units were ordered in December from the Pullman Company and are to be delivered in July. The specifications follow:

Length over all	64 ft. 0 in.
Truck wheelbase	11 ft. 0 in.
Width over all	9 ft. 9½ in.
Body	Steel
Headlining	Steel
Roof	Arch
Air brakes	Westinghouse
Axles	Heat-treated
Car signal system	Faraday
Car trimmings	Bronze
Side bearings	Stucki
Control	Westinghouse
Couplers	Tomlinson MCB
Curtain fixtures	Railway Curtain Supply
Curtain material	Pantasote, silk lined
Hand brakes	Peacock
Heater equipment	Peter Smith and Railway Utility
Headlights	Electric Service Supplies
Journal bearings	Plain
Journal boxes	Symington
Paint	Chicago Varnish
Sash fixtures	O. M. Edwards
Seats	Pullman chairs
Seating material	Leather
Slack adjuster	Westinghouse
Step treads	Stanwood
Trucks	Commonwealth Steel Co., six-wheel
Ventilators	Railway Utility
Wheels	36-in. A.R.A.

Four locomotives are also being constructed for this road. Baldwin Locomotive Works is the builder and delivery is expected to be made on June 1. They were ordered Sept. 21, 1925. Specifications for these units are given here:

Weights:	
Body and trucks	102,379 lb.
Equipment	57,621 lb.
Total	160,000 lb.
Bolster centers, length	18 ft. 4 in.
Length over all	39 ft. 4 in.
Truck wheelbase	8 ft. 8 in.
Width over all	10 ft. 7 in.
Height, rail to trolley base	12 ft. 1½ in.
Body	Steel
Air brakes	Westinghouse
Axles	Standard Steel
Compressors	Two Westinghouse D3-F
Control	Westinghouse
Couplers	Tomlinson M.C.B.
Gears and pinions	Nuttall, grade B-P
Hand brakes	Peacock
Heater equipment	Railway Utility
Headlights	Electric Service Supplies
Journal boxes	Symington
Lightning arresters	Westinghouse
Motors, type and number	4 Westinghouse No. 3553
Motors	Inside hung
Sanders	Ohio Brass, Form 1
Springs	Baldwin
Trolley base	Westinghouse
Trolley wheels or shoes	Miller and Pantograph
Trucks	Baldwin
Wheels (type and size)	42-in. tired
Special devices, etc.	Sirocco blowers, fan for motor ventilation

New Merger in Rubber Field

Financial interests of the Hewitt Rubber Company, Buffalo, N. Y., and the Gutta Percha & Rubber Manufacturing Company, New York and Brooklyn, have recently been merged. At a reorganization meeting held in Buffalo, N. Y., F. E. Miller was elected president of the Gutta Percha & Rubber Manufacturing Company, John H. Kelly and Amadee Spadone were elected vice-presidents and W. J. Magee became secretary and treasurer. The reorganization is the first step in the removal of the company's plant, office and other facilities to Buffalo. The company will continue the manufacture of corded fabric tires and mechanical rubber goods. It is expected that the personnel of the two merged companies will remain unchanged.

Turbine Drive for Boiler Feed Pump

Numerous advantages in favor of the use of turbine-driven boiler feed pumps are shown in the report of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio. A year ago the company replaced two steam pumps with one General Electric 60-hp., style D-51, two-stage turbine-driven centrifugal pump. The total annual saving has been $663, a return of 28.9 per cent on the investment. The pumps are now held as standby.

Although the new unit has 50 per cent greater capacity than the two previous pumps, it occupies only one-fourth the floor space. Its water rate is approximately 20 per cent less than the water rates of the Duplex pumps. The turbine has required no repairs, whereas the pumps averaged $235 a year for repairs and renewal of parts. Only one-fifth as much time is now required for attendance, and the oil consumption has been cut from one gallon a day to one-half gallon a month. The turbine operates with a minimum of noise and vibration.

Temporary Relief for Shortage of Equipment in Detroit

Detroit Department of Street Railways has been authorized by the City Council to rent from the Peoples Motor Coach Company, a subsidiary of the Detroit United Railway, ten single-deck 25-passenger motor coaches on a basis of 8 cents per coach-mile.

H. U. Wallace, general manager of the D.S.R., is quoted as recommending the rental of the coaches until such time as the department is in position to add to its own equipment. The department is having difficulty to give proper service on existing coach lines due to lack of sufficient equipment. A large number of the street cars still in operation by the D.S.R. that were taken over from the Detroit United Railway are reported to be in very poor condition, and this condition enhances the need for new equipment including both street cars and motor coaches.

Mack Sales to Traction Companies

Among recent sales of Mack buses to electric railways by the International Motor Company are the following:

Beaver Valley Motor Coach Company, New Brighton, Pa., one 25-passenger city type, for operation between Leetsdale, Ambridge and Beaver Falls. Zone fare system, 5-mile route, 10 cents per zone.

Savannah Electric & Power Company, Savannah, Ga., one 29-passenger city type, trolley substitution in Savannah. Fare, 7 cents.

Twin City Motor Bus Company, St. Paul, Minn., seven 230-in. chassis, Eckland bodies, for operation between Minneapolis and St. Paul, a 12-mile route at a 25-cent fare.

Los Angeles Railway, Los Angeles, Cal., three 230-in. chassis, for operation at a 5-cent fare over a 3.06 mile route on Alvarado Street.

Yakima Valley Transportation Company, Yakima, Wash., a subsidiary of the Union Pacific Railroad, one 29-passenger city type, for operation on the Summit View line in place of trolley cars over a 3-mile route at a 10-cent fare.

Utah Light & Traction Company, Salt Lake City, Utah, one 29-passenger city type to operate as a feeder to trolley line over a 6-mile route between Sugar House and Mill Creek for a 10-cent fare.

Boston Elevated Railway, Boston, Mass., three 29-passenger city type, for operation on Boston and vicinity routes.

Rochester Railways Co-ordinated Bus Line, Rochester, N. Y., part of New York Railway System, one 25-passenger city type bus.

Cincinnati Gets 54 Buses

Cincinnati Street Railway is purchasing 29 Mack buses, equipped with Bender bodies; eighteen Six-Wheel chassis, with Kuhlman bodies, and seven Schacht chassis, the bodies for which have not been determined. Permits were issued on Feb. 18 for operation on all bus lines except route H.

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Samuel M. Curwen Sees Enlarged Market for Transportation Vehicles

President of New Brill Corporation Outlines the Advantages of Recent Merger—Expresses Confidence and Optimism Relative to the Electric Railway Situation—Sees Dawn of New Era of Usefulness and Prosperity

AN INTERVIEW

By Charles Gordon

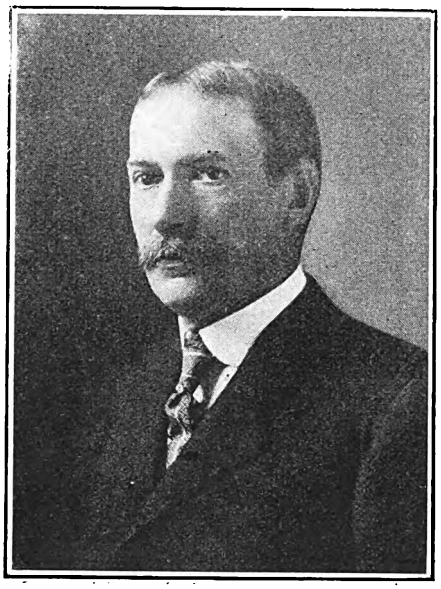
IT IS significant that the recent combination of Brill and American Car & Foundry resources comes at a time when the electric railway industry is just entering a new era; when concrete evidence is available of the opportunity for intensive development of facilities, and when interest in improved electric railway equipment is growing rapidly. The new Brill Corporation, which Samuel M. Curwen now heads as president, links enormous financial and manufacturing facilities for the construction of all forms of common carrier transportation—steam, electric and automotive vehicles for both highway and rail operation.

What are the advantages of this combination to the purchasers of electric railway cars and equipment?

How will it affect the design, manufacturing and sales organizations of the several companies controlled by the new Brill Corporation?

Are any changes contemplated in the character of work at the various Brill plants now building electric railway cars?

Does this consolidation indicate a belief that the electric railway field has arrived at a point where its recovery and expansion may be hastened by mustering to its service greatly expanded design, manufacturing and merchandising facilities?



Samuel Curwen

Outlines Plans of Company

Back of every great development is a strong personality. History itself is only a record of the lives of the men who made it. So, also, in following the development and expansion of great industrial enterprises, back of the physical framework and shell of the structure there is found a dominating personality which supplied the imagination, courage, will power and driving force to rear it and give it life. There the man is found.

The industry is naturally interested at this time in getting the viewpoint of Sam Curwen, as he is best known among his many close friends. Although busily engaged in clearing up the details connected with the present changes, he consented to outline the present plans of the companies now brought together and in addition expressed a view of the electric railway situation which in itself radiates confidence and optimism for the future.

To the purchasers of electric railway equipment, the advantages of the recent merger, while indirect only, are nevertheless of outstanding importance at this particular time, according to Mr. Curwen. The new Brill Corporation, control of whose common stock rests with the American Car & Foundry Company, is primarily a holding company, organized to take over the various subsidiary plants that are thus drawn together for greater co-ordination of effort. In this combination are included two groups of properties. One group consists of the J. G. Brill Company, with its subsidiaries — the G. C. Kuhlman Car Company, in Cleveland, the American Car Company, in St. Louis, the Wason Manufacturing Company, in Springfield, Mass., and the Cie J. G. Brill in France. The second group consists of the new American Car & Foundry Motors Company, made up of the Hall-Scott Motors Corporation and the Fageol Motor Car Company of Ohio. By drawing together these large facilities for the production of both rail and highway transportation equipment, he pointed out, additional impetus will be given to the development of both forms of vehicles.

RAPIDLY growing confidence in the electric railway situation and interest in the improvement of electric railway equipment give added significance to the recent merger of Brill and American Car & Foundry resources. This is the first of a series of interviews with car builders and other prominent manufacturers regarding the outlook for the industry.

Mr. Curwen shed further light on the plans for the immediate future. These do not contemplate any material changes in the functions of the various plants. While the future may dictate the combination of the present automotive rail car and bus body products of the Philadelphia and Cleveland plants of the Brill Company with the other automotive activity of the American Car & Foundry Motors Company, no changes of this character are contemplated for the present. He indicated that the products of the Philadelphia plant, the Fageol Company of Ohio and the Kuhlman plant in Cleveland will continue to be offered to the trade.

The J. G. Brill Company, Mr. Curwen explained, will continue its long-established policy of building electric cars and their trucks for both domestic and export shipment. Through many years these products have become known and have built up a reputation throughout the world. The process of development and improvement will be continued. The extent to which this has been carried on in the past, he pointed out, is attested by the many patents granted the company covering devices developed by its engineers for improving the performance of cars and increasing the comfort afforded passengers. The seaboard location of the Philadelphia plant and the facilities for shipment of electric railway and self-propelled cars adapt it admirably for export business.

So far as present plans contemplate, the four present Brill plants are considered to be so situated in their respective territories as to avoid unnecessary heavy freight charges in the shipment of their products to electric railways in various parts of the country. It seems logical that this territorial arrangement will continue to be advantageous.

Mr. Curwen expressed the utmost confidence in the future of the electric railway industry. He declared that there is no intention of subordinating electric railway car development and

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production to bus or self-propelled cars. Through the combination of interests represented, it is the intention to develop and cultivate intensively every form of public transportation on steam railroads, electric railways and highways.

Buses to Play Important Part

Since the manufacture of buses looms as an important part of the new company's activities we passed to that subject. Mr. Curwen held that the extent to which the bus may in the future be applied as part of the transportation system of the country is as yet a matter for conjecture. He pointed out that the bus has been definitely proved to have an important part to play in feeder service and through districts where a de luxe service at higher fares than mass transportation agencies is desired. In new territories, where the character of future development is uncertain, the flexibility of the bus offers an opportunity of extending transportation service at minimum initial expense until such time as the volume of riding justifies the investment in rail and overhead line. Its more economical operation, and its apparent superiority of facilities for quick loading and unloading of passengers, makes the use of the street car imperative where the volume of riding approaches mass transportation conditions.

This answer was made to a question regarding the extent to which Mr. Curwen expected to see the bus play an active part in the future local transportation scheme of the country. But he went further. He pointed to increased parking congestion difficulties in large cities as a reason for a growing field for application of de luxe bus service at substantially higher fares than electric cars, and predicted that there would be a large increase in demand for such transportation agencies to replace the use of private automobiles for travel in the congested portions of large cities. There was little doubt in Mr. Curwen's mind of the future usefulness of the bus.

Has Intimate Knowledge of Car Development

Here the discussion centered more definitely on the electric railway car and the future of the industry itself. Mr. Curwen's knowledge of cars, trucks and equipment comes from detailed contact with their design, construction and operation. Prior to 1891, when he became a general salesman for the Brill Company under John A. Brill, he had worked his way through the drafting department to the position of chief draftsman. From the position of salesman he became assistant general manager and in 1903 was made general manager. In 1908, upon the death of John A. Brill, he became first vice-president, and in 1912 succeeded James Rawle to the presidency.

Not even after he was carrying heavy executive responsibilities did Mr. Curwen relinquish close contact with the improvement of the company's products. Careful study of the operating problems of the industry enabled him to foresee its requirements and resulted in the development of many of the valuable patents owned by the company.

With this background of experience to draw from, I sought his opinion on the status of car design and on the outlook for the electric railway industry.

"The car exhibits at the Atlantic City convention last fall to my mind showed that the electric car can be made as attractive as the automotive vehicle," he said. "It is necessary, however, in refining the electric car to bear in mind that its service is to the masses, and that while a part of the public would be willing to pay the higher rate of fare necessary to maintain such refinements, it is questionable whether passengers generally are not more interested in reaching their destinations with the quickest dispatch. While comfort is important, it is subordinated to the other functions of the electric car in handling large crowds quickly."

"What, in your opinion, is the outlook for electric railway car purchases during 1926?" I asked.

"From present indications the outlook is very promising and the large number of inquiries for new cars shows a tendency on the part of electric railways to recognize the advantages of up-to-date equipment. With the knowledge that it will be profitable to replace many of the obsolete cars now in service and with convenient financing facilities available, it is probable that electric railways will retire this year many of the cars which they know are costing them much more to operate in comparison with new equipment than the interest requirements on the investment in new cars."

How the operating managements in the industry can co-operate in bringing about improved design of cars and in lowering manufacturing costs seemed an important angle of the subject. In Mr. Curwen's opinion, precedent and purchasing methods have much to do with this question. He pointed out that it has been traditional in the industry to specialize in types of rolling stock to suit individual ideas of design. This, he explained, is not economical. Car builders are willing to build whatever the customer wants, provided the latter is prepared to pay the additional cost of special design and construction. He indicated that manufacturing costs would be lowered by more uniformity in design.

Interurbans Have Important Place

Our discussion closed on the subject of the outlook for the interurban lines of the country. Mr. Curwen was optimistic in his view of their future usefulness, except of course in those instances where conditions did not warrant the construction of lines in the first place. He pointed to the examples of roads in which the application of light-weight and modern equipment by greatly decreasing the cost of operation has resulted in vast improvement of situations formerly held to be hopeless. He is convinced that the spread of this process to other properties will be followed by a period of renewed prosperity and usefulness for many interurban lines. He held that the ease of maintaining schedules and the comparatively high degree of safety of the interurban make it a transportation agency which, with proper facilities, has a valuable function and service to perform.

Rolling Stock

Cleveland Railway, Cleveland, Ohio, has before the Council for action a program of improvement totaling $5,000,000 which calls, among other things, for the purchase of 100 new cars and a similar number of buses.

British Columbia Electric Railway, Vancouver, B. C., intends to order some new equipment. One authority states that the equipment will probably consist of four two-car trains and eight single cars.

Hydro Electric Railways, Toronto, Canada, is awaiting delivery of twelve cars for Windsor offered to the radial department of the Provincial Hydro Commission under $10,000 each. The cars have been inspected and pronounced suitable for use in Windsor. Five new cars have also been ordered by the company and will be delivered in three or four weeks.

Municipal Railway, San Francisco, Cal., plans to purchase fifteen or twenty cars, at a cost of $255,000 and $340,000 respectively.

Union Traction Company of Indiana, Anderson, Ind., through Arthur W. Brady, receiver, has prepared a petition asking authority to purchase sixteen buses. The approximate cost will be $135,000. The purchase will include eleven of the large type passenger buses that have been in use on the Hoosier Stage line. The five others are to be buses for use on city lines in Muncie and Anderson, Ind. The transaction has been sanctioned by the Indiana Public Service Commission and all that now remains to complete the deal is the sanction of the Circuit Court at Anderson.

New York Railways Corporation is contemplating the purchase of 25 additional buses for experimental purposes in the co-ordination of bus and trolley service. These buses will be single-deck units of the same general type as the sample bus which was designed by the company last summer and described in detail in ELECTRIC RAILWAY JOURNAL of Sept. 5. No franchise has been received for the regular operation of buses as yet, but the application has been filed for some time.

Track and Line

Binghamton Railway, Binghamton, N. Y., will construct an extension along Floral Avenue in Johnson City from Askley Avenue to Riverside Drive. The evidence showed that the village authorities, the residents of Floral Avenue and the company have agreed on the paving of the street and the extension of the trolley line under its franchises. The Public Service Commission has approved the extension.

Philadelphia Rapid Transit Company, Philadelphia, Pa., has submitted plans for laying a double track on Erie Avenue from Second Street to Torresdale Avenue and on Torresdale Avenue to Frankford Avenue. The track extension will provide a cross-city route for the accommodation of the public in the northeast section.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Speeding Up Railway Operation Helps Local Merchants

ELIMINATION of automobile parking in congested districts will aid retail business rather than injure it. That is an old story to the experienced transportation men of the electric railway industry, but the local merchants usually refuse to believe it. Without taking the trouble to analyze the situation carefully, the average storekeeper jumps to the conclusion that his trade will suffer if customers are not allowed to park their automobiles in front of his door. That the users of public transportation vehicles outnumber the users of private vehicles in the ratio of three or four to one is overlooked.

In Pittsburgh, however, the experiment of prohibiting all parking on certain downtown streets was made in the early part of last year and the results have demonstrated that the apprehension of the merchants was groundless. Checks made by the research department of the Pittsburgh Railways show that there has been a substantial reduction in the running time of street cars since the new parking restrictions have been in effect. Detailed figures are published elsewhere in this issue. It is even more interesting to note that the downtown retail trade has prospered more than that in the outlying sections since the change was made. Industrial depression which prevailed during 1925 resulted in a slight decrease in trade throughout the Pittsburgh district. In the downtown section, however, the effect was less noticeable than in the district as a whole, the volume of business being only 0.8 per cent lower than in 1924, whereas for the entire area the decrease was nearly 3 per cent.

The conclusion seems fairly obvious that the downtown merchants prospered by the enactment of traffic regulations that made it easier for the majority of people to reach their stores. This result is probably no different from that which has followed the establishment of similar regulations in other cities, but Pittsburgh is particularly fortunate in being able to establish the fact by such convincing figures.

New Cars Are Desirable Because They Will Earn More

REPLACEMENT of 28,000 electric railway cars has seemed to some persons such a radical proposal that in certain quarters it has been questioned. "We cannot throw away more than a third of the rolling stock of the industry," say these managers. "How can we finance the purchase of new cars for the purpose when money is not to be had for much-needed extensions?"

Such an attitude naturally does not take into account the real purpose of the plan for using new cars instead of old. No one contends for a moment that these cars can or should be replaced all at once. It will tax to capacity all the car building plants in the country for several years to carry through such a program, to say nothing of the new cars which are needed for extensions of service.

The real point is that new cars are urged because they will earn their keep. Cars twenty years or more old were built prior to the development of modern equipment and devices, and before steel was used to any considerable extent in framing. Nearly all such cars are heavy for their carrying capacity. Platforms, doors, aisles and step heights were not designed to get riders in and out quickly or efficiently. Provisions for fare collection are inadequate. The trucks and motors are relatively inefficient. Then, too, with twenty years or more to their credit they are not able to give the quality of service they once could, nor to operate at the same cost for maintenance.

It can be shown easily that new cars are an economy. Mr. Storrs has done that in several addresses. Mr. Budd in his Indianapolis paper before the Central Electric Railway Association not only gave a few examples of what new cars have done, but he listed a dozen roads that have increased their revenue, both gross and net, in the past five years. A factor of no inconsiderable importance in each case was the substitution of new cars for old. What does the cost of new cars matter if the net revenue can be increased materially due to their use?

Merger of Electric Railway and Bus Manufacturers Should Speed Co-ordination

TRANSPORTATION men should view with favorable interest the recent consolidation of the American Car & Foundry, Brill and Fageol interests. Here large builders of steam railroad and electric railway cars have added to their interests a going bus manufacturing business of considerable size and importance. The new company now stands in the unusual position of being prepared to sell transportation vehicles of practically every type now seriously considered. The principal men in the new company have wide experience in their respective fields. By combining their knowledge and financial resources as they have, the way is opened for constructive thinking of the kind that should prove helpful to the industry at this time.

Never before in the history of the transportation industry has there been more need for care in the selection of the type of vehicle to be used, particularly in local systems. While engineers may estimate the results to be anticipated with this or that method, it remains for the builder to produce the vehicle which will carry out the proposal. It has been seen repeatedly that such elements as vehicle weights and operating speeds spell the difference between success and failure. The manufacturers' engineering committee, recently formed

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under the auspices of the American Electric Railway Association by car builders and equipment men, can do much in pointing out these things. But the result must necessarily lie with the company that actually builds the equipment.

Consideration of the bus in connection with many of the problems of local transportation makes it essential that its use be given careful study and fair and unbiased treatment. For the first time a manufacturer is in the position to build either cars or buses as desired. This gives it the opportunity to study in a practical and unbiased way the advantages and the limitations of each method of transportation under different operating conditions. This it can do if it will reveal its findings without fear or prejudice. By grasping its opportunities it is in an enviable position to aid the movement for co-ordination and modernization of transportation methods. Through the wide and diversified experience of its personnel, it can give a greater measure of constructive help than was possible when the companies were divided and operated individually.

Skillful Public Relations Work Made Part of a Rehabilitation Program

METHODS by which transportation revenue has been increased 65 per cent in three years on the Chicago, Aurora & Elgin Railroad are told of elsewhere in this issue in the first of several articles describing the rehabilitation of the property. Many factors have contributed to the development. The territory is a highly competitive field in which four steam railroads operate suburban service in addition to that provided by the electric line. It has been necessary, therefore, to use every available means of building up the traffic.

Of greatest importance in the success which has attended the efforts of the company has been the really high-class service rendered by the Aurora-Elgin line. Many new and modern cars have been bought. Track has been thoroughly rehabilitated, using stone ballast in place of gravel. Old stations have been spruced up and attractive new stations built. Power facilities have been improved. Signals and additional crossing protection devices have been installed.

Besides the great improvement which has been made in the physical plant, skillful work has been done in fostering good public relations. Among the interesting steps taken in this direction might be mentioned the issue of special low-rate homeseekers' tickets. These have been used to encourage residents of Chicago to go out into the Aurora-Elgin territory to examine its possibilities as sites for future homes. Many people whose first knowledge of this electric railway was acquired in this manner have now become regular patrons.

Commutation tickets have furnished another means of cultivating public relations. Whenever a new name appears on the list of buyers of monthly tickets, the management sends a special message of greeting expressing the hope that the new ticket buyer will find the service satisfactory and requesting his co-operation in finding ways to improve it. In case an old name disappears from the list of commutation ticket buyers a representative of the management calls to find out why the former user has dropped out. In this way many minor shortcomings of the service have been discovered, and by the exercise of tact and diplomacy former customers have been won back to the railway. The possibility of copying these particular methods does not exist on every railway, but alertness to take advantage of the opportunities that do exist, however, will usually do much to improve public relations and build up traffic.

Boston Figures Deserve Careful Study

LIGHTLY to pass over the record of the Boston Elevated Railway for 1925 as disclosed by the digest of the annual report in the issue of the JOURNAL for Feb. 13 would be a mistake for others engaged in the work of the industry. That report as presented by the public trustees to the state reflects not only the record of the road itself, but it contains in its statisics many unit figures that are of immeasurable value for comparative purposes. Of the value of these to him each reader must judge for himself. Aside from all this, however, there are certain points which should perhaps be emphasized.

Of particular interest is the attitude of the company on the matter of buses. The management is ready to furnish bus service wherever it appears desirable to do so. It might at first be thought that this was only a generality, but that is not so when the record of increase from 63,937 bus passengers in 1922 to 2,472,456 passengers in 1925 is considered. The chartered bus is also becoming a factor at Boston. Of interest, too, is the plan made for parking automobiles outside of congested centers and inducing their users to journey into the city on the car lines. Particularly proud are the trustees of the record that shows that only 12.7 per cent of the passenger cars now in service on their lines are more than twenty years old compared with the fact that of the 82,340 cars in the United States in similar service 34 per cent are of greater age. The accident record also reflected the intensive work that is being done to decrease the hazard to the passenger.

One of the saving features at Boston is that a broad discretion is vested in the trustees to change the rates of fare when necessary, but their acts are subject at all times to the principle of service at cost. True, $2,327,816 is due to the cities under the provisions of the public control act that if in any year the established rates of fare do not meet the cost of service and the reserve fund of $1,000,000 is used up, then any loss above that amount will be paid over by the state to the trustees. Any such amount paid by the state is assessed upon the cities and towns in which the lines are operated in proportion to the number of persons in such cities and towns using the service at the time the payments are made by the state. If, in later years, receipts exceed the cost of service, any amount in the reserve fund in excess of the $1,000,000 with which it was started is paid over by the state to be repaid to the cities and towns until any assessments have been repaid. Thereafter, any such excess remains in the reserve fund until needed to meet the cost of service. Fares are then to be reduced as described above.

These are terms that have been stated many times before. Sight should not be lost of them in any study which is made of the mass of data contained in the report of the trustees as presented to the Legislature.

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Under the conditions that prevail at Boston it was no ordinary performance on the part of the management that resulted in the showing of $502,195 in 1925 as the balance of receipts above the cost of service compared with a deficit of $636,696 for 1924. In fact, the more one studies all the circumstances the more is the truth borne home that the residents of Boston are the real subjects for congratulation.

Staggered Hours Again Proposed to Relieve New York Transit Situation

RELIEF from the almost intolerable conditions on the rapid transit lines of New York is proposed by the Health Commissioner and the head of the Transit Commission through the adoption of the staggering of working hours. The plan was proposed in Washington and in New York during the war, and was actually put in practice for a short period in each city. Its use was abandoned, largely because the workers had not accustomed themselves to the adjustments necessary in their daily routine. In Washington it is said that the difficulty of obtaining negro maids who would prepare breakfast at several different periods had much to do with the disfavor into which the plan fell.

Outside of the transportation industry, it is not generally realized that peak-load conditions have become much worse during the past few years. Evidence to this effect is readily available, however. Study of the load curves of a number of the large electric generating stations illustrates in a striking way the change that has taken place. Between 1920 and 1925 there has been a marked improvement in the load factors of stations which supply no railway power, while in the case of generating stations serving the electric railways the load factor has become worse during this period.

Undoubtedly the present situation is a serious one. Congestion in the streets, overcrowding of transportation vehicles, excessive investment cost for equipment needed only in rush hours and uneconomic use of power station facilities all indicate the imperative need for some form of relief. Staggered working hours will afford a measure of such relief if the public is willing to accept this solution of the problem.

Reduction in Hours of Labor Has Increased Rush-Hour Congestion

ACCENTUATION of the sharpness of the rush-hour peak demands on the urban transportation systems is due in a considerable part to reduction in the hours of labor. The time for starting work has been set later, so that the executives, clerks and laborers begin and end their business day more nearly at the same time. This has meant that to carry the people on the transportation systems additional equipment has had to be put in service as far as possible. Beyond that, overcrowding has been the only way out.

Shifting of the hours of work slightly will make it possible for the transportation companies to give better service than under present conditions. If the spread of working hours is over only a limited period, the plan will tend to increase rather than to decrease the cost of rush-hour service, as the maximum loads per vehicle will be reduced. Real relief can be obtained if the hours can be spread sufficiently so that the cars and trains can make more than a single round trip during the rush hour, which is all the most of them can make under present conditions. In case enough spread in the peak can be obtained so that two or more trips can be made it will mean that much better service can be provided at a cost no greater than the present. It will mean that construction of rapid transit lines, now sadly behind due to the policies of ex-Mayor Hylan, will be given a chance to catch up with the growth in population.

The same plan can be used to advantage in any city where there are sharp rush-hour peaks. As a means of getting more transportation it has such merit that, barring the construction of new lines, it warrants serious consideration.

Detroit Will Pay for Its Cars Out of Earnings

INTEREST in the suggestion of H. U. Wallace, general manager of the municipal railway at Detroit, Mich., to acquire 300 more new cars and 150 new buses goes beyond the proposal itself. True, that suggestion reflects the growth of the demand for transportation, but it is his remarks about the inadvisability of keeping old cars in service that show the modern trend in selling transportation. The information available does not indicate the age of the equipment which Mr. Wallace would replace. It would be interesting to know that. Of greater significance is the fact that the department at Detroit has been assured it will be able to secure new cars and buses, on terms that will permit it to pay for all of the cars out of earnings or out of the savings that the department will be able to make in the cost of operating the new, light, modern rolling stock as compared with the present heavy and obsolete units.

Mr. Wallace is not given to making rash statements or to holding out promises that are not likely to be fulfilled. His task at Detroit is a difficult one. He knows that. If other evidence of his ability correctly to diagnose the needs of Detroit were needed it is furnished in the paper presented by him before the Highway Engineering Congress at Ann Arbor on Feb. 17, a digest of which is published elsewhere in this issue. That shows his grasp of the general situation. More recently, however, he went on record with respect to the need for up-to-date rolling stock before the North End Business Men's Association. He knows what the public wants. As the disposition of the Board of Street Railway Commissioners is favorable to his proposal the riders of Detroit will probably get what they want. Not only that, they will apparently get it on terms and conditions that should appeal to the railways elsewhere confronted with similar problems of providing adequate rolling stock, some of which have heretofore been loath to believe that the plan which he has in mind was workable.

The Detroit proposal is, of course, not new. Its sponsors would not claim credit for that. But the credit is theirs of putting the matter before the public in its present light and of being prepared to subject the matter to the acid test of daily experience. The equipment trust obligation, in which the cost of new equipment is amortized over the years out of earnings, is an old device, but resort to it has been all too infrequent in the electric railway field.

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Depreciation as an Operating Expense

FIRST ARTICLE

Definition of the Problem—Service Life Is Difficult to Determine, and on This the Whole Structure Rests—Illustrations Given to Show Several Viewpoints—Creation of a Depreciation Reserve Is Vitally Important

By W. H. Maltbie
Late General Counsel United Railways & Electric Company of Baltimore

SOME months ago, as the result of a conversation with one of the editors of this paper, the author undertook to prepare a series of articles on the subject of depreciation. This series was looked forward to with great interest, as Mr. Maltbie was an outstanding authority on the subjects of valuation and depreciation. After his death, the manuscript was located and forwarded to this paper through the kindness of J. H. Hanna, chairman of the A.E.R.A. committee on national relations sub-committee on depreciation, of which Mr. Maltbie was a member.

These articles were written from the viewpoint of the present investigation by the Interstate Commerce Commission of the whole subject of depreciation of electric railway property. This investigation was undertaken with a view to establishing definite rules and regulations covering the allowance of charges for depreciation as an operating expense on all roads subject to its jurisdiction. Since there is a possibility that any regulations of this sort established by the I. C. C. may be accepted as a precedent by various state commissions it is important that all street railway executives should be familiar with the present situation.

These three articles, dealing respectively with causes of depreciation, methods of setting up funds to provide for depreciation and practical methods of building up a retirement reserve, constitute a valuable contribution to the literature on the subject. They were probably the last creative work of the author.—EDITOR.

THE interstate commerce act, as amended Feb. 28, 1920, contains in Sec. 20, paragraph 5, a direction to the Interstate Commerce Commission to determine for all carriers subject to the act the classes of property for which depreciation charges might properly be included under operating expenses and the percentages of depreciation that should be charged with respect to each such class of property with power to the commission to classify carriers for this purpose and thereafter, if necessary, to modify these items. The act further provides that carriers subject to the act shall not charge to operating expenses depreciation on any classes of property except those included by the commission or charge for any class of property a percentage of depreciation other than that prescribed by the commission.

There is some dispute as to the real intent of this section of the law. Some hold that Congress was fearful lest certain railroads should use their previous freedom as to the setting up of depreciation reserves as a means of absorbing income which would otherwise be subject to recapture, and passed the section in question solely with a view of preventing overcharges for depreciation. Under this interpretation of the act the charging of depreciation upon any particular class of property is optional with the company, but if charged it can be only upon those classes of property which the commission has selected, and at the rate which the commission has fixed.

Others hold that it is the intent of the act that the Interstate Commerce Commission should set up classes of depreciable property and fix percentages for each class, and that thereafter carriers subject to the act shall set up depreciation at the fixed percentages upon all property classed as depreciable.

In carrying out the provisions of the act the Interstate Commerce Commission has created a depreciation section in its Bureau of Accounts and instructed this section to make a study of depreciation for each class of carrier subject to the act and prepare a report to the commission which will be made the subject of subsequent testimony, brief and argument.

Reports upon carriers by water, telephone companies and steam railroads have already been prepared and filed by the depreciation section, and the study of electric railway property is now in progress. No decision has been handed down by the Interstate Commerce Commission in any of these cases.

While the depreciation section, of course, is not compelled to follow in its electric railway report the precedents established in its other reports, the reports already published indicate the general point of view of the section.

The American Electric Railway Association has undertaken to give the Interstate Commerce Commission the fullest possible co-operation, and with that end in view has created a sub-committee of the committee on national relations to handle the problem, with J. H. Hanna of the Capital Traction Company, Washington, D. C., as chairman, and on the recommendation of this sub-committee employed the writer as its attorney to study the collected information, prepare the case for the association and submit it to the Interstate Commerce Commission.

DEPRECIATION A TWOFOLD PROBLEM

The problem is so complex and the information already furnished to the commission and the association indicates such a wide divergence of views, and in some cases such a complete misunderstanding of the situation, that it seems wise to accept the invitation of the JOURNAL and attempt to clarify matters by a discussion of the problem now under consideration.

Depreciation is in reality two distinct problems. The

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difference between them will perhaps be more clearly understood by considering the executive who has bought a new car and confining our attention for the moment to the single car. It is a reasonably safe bet that at some future date that car will be retired and replaced by a new one. When that time comes the company should have at hand a sum equal to the cost of the retired car, accumulated during the life of the car. A determination of the annual contribution to this retirement fund is therefore nothing more than the simple operation of dividing the cost of the car by the number of years of its service life.

But what is its service life? It may go out at any time through an accident; it may wear out at some future date, which may be almost indefinitely deferred by proper maintenance or hastened by lack of proper care; a change in the art may make it so uneconomical a unit to operate as to force its retirement; it may no longer meet with the approval of public taste; or it may become inadequate on account of its speed or loading limitations and be retired for that reason. No matter how skilled and experienced the executive, his answer to the question is a guess, based upon a consideration of those causes which tend to shorten and those causes which tend to lengthen the useful life of the car in question.

The executive, if he is wise and his revenues will stand the strain, having made his guess as to the service life of his one car, will deliberately shorten it in order to protect himself in case its ultimate retirement comes earlier than he anticipates. Even then, if he is dealing with a single car, he is liable to lose a large part of his investment, since it is impossible to accumulate a reserve with sufficient speed to protect the owner against all possibilities of accidental destruction.

Depreciation Must Be Treated as an Operating Charge

The annual payment into this reserve will be treated as an operating charge, and the problem which the executive has now solved is the problem of depreciation as an operating expense.

Now let us assume that ten years have elapsed and that the executive desires to know the value of the car, which has not yet been retired. His problem is: "How much is the car worth to me; how much will I take for it and purchase a new car?" And the answer to the question is to be found in a comparison of the expected life of the car as it stands with the expected life of a new car replacing it. The original life expectancy was a guess based upon an estimate of the length of life till retirement through accident, the length of life till retirement through obsolescence, the length of life till retirement through wear, and the length of life till retirement through inadequacy. Ten years have elapsed, but withdrawal through accident is no nearer than it was ten years before. If the art has been changing, retirement through obsolescence may be at the very door; if the art has not been changing, it is probable that the life until obsolescence retirement estimated today will be as long as the life estimated ten years before.

The danger from removal through inadequacy may be as indefinite as it was ten years before, may be much greater, or may even be more remote. The amount of remaining wearing life depends on the present condition of the car. It would seem evident, therefore, that the question of the present value of the car cannot be answered merely by a computation based upon the executive's original guess as to service life and the elapsed period of ten years.

A Second Illustration

The distinction will perhaps be clearer if we use more definite quantities in our illustration. Let us assume that the car in question was a double-truck, four-motor equipment with a seating capacity of 40, and that the company operated an interurban line connecting a number of smaller communities with a larger center, but had no urban division. The executive, on the basis of his own experience and such information as he can collect elsewhere, decides that in the long run, so far as mere wear is concerned, cars may, with proper care and maintenance, be kept in active operation for a period of 50 years. Therefore his protection demands an annual appropriation of 2 per cent. He is one of those who believe that the gradual progress of the art will continue and that passenger cars in general will become obsolete after 20 years. Protection from this demands an annual appropriation of 5 per cent. Finally, believing that his central city is about to develop as a manufacturing center to which the smaller communities which he serves will become suburban areas, he reaches the conclusion that within ten years this car will become inadequate and must be replaced either by cars of larger capacity or by multiple-unit trains. He therefore, for this reason, assigns a ten-year life and sets up a reserve of 10 per cent annually.

Since the reserve for inadequacy will provide the entire cost of the car before either obsolescence or use demand its removal, the latter elements are entirely ignored, and the depreciation reserve of 10 per cent set up on account of inadequacy is the sole reserve set up, and the service life is estimated, therefore, at its minimum figure of ten years.

Now that the ten years have elapsed, however, the car would have, if original conditions had continued and the original estimates been correct, no value except scrap or resale. As a matter of fact, however, the executive's expectations as to the development of his central city as a manufacturing area have not been realized. Instead, it has developed as a jobbing and educational center. His 40-seat unit passenger car is as adequate today as when it was first installed, and there is practically no probability that it will ever become inadequate. Moreover, the executive has acquired in the ten-year period an urban division, and therefore if the inadequacy should by any chance occur, he is prepared to shift this car to meet the constantly increasing demand for urban service. It is, therefore, so far as inadequacy is concerned, just exactly as valuable as it was at the beginning of the ten-year period.

So far as obsolescence is concerned he finds that the manufacturer is still building the same car and selling it, and that he himself, if he desired to increase his service with new cars, would probably buy identical equipment with that which he already operates. He still believes that in the long run cars will go out through obsolescence in an average of 20 years, but there is certainly no difference, so far as obsolescence is concerned, between this car and the new cars which are being turned out by the factory, and therefore, if he assumes that this car has lost half of its value because ten years of the assumed 20-year life have elapsed, he is driven to the ridiculous conclusion that

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new cars coming from the factory are worth only half what they cost.

So far as wear is concerned, while he anticipated 50 years of usefulness, the car may actually have done better or worse than he anticipated, and the only thing to do is to examine it and determine whether or not it has probably more or less than 40 years of life remaining.

Suppose that on examination he finds that it is wearing about as he expected. He has then a car which will presumably wear for 40 years; is probably good, so far as obsolescence is concerned, for 20 years, and is in no danger of inadequacy. Its probable service life, at the end of the ten years originally estimated, is therefore 20 years, and the car for which a reserve of the full difference between cost and resale value has been accumulated bids fair to render the same service, and therefore to be as valuable, as a new car.

In other words, present-day value is not to be measured by elapsed life, or by the deduction of the existing reserve from the present value. In the words of one of our federal courts, depreciation reserves "represent what observation and experience suggested as likely to happen, . . . with some margin over . . . The law requires deduction only for actual depreciation, just as actual as the present value, and the extent of that depreciation must be ascertained by the same kind of evidence; in the last analysis opinion based on contemporary investigation." U. S. District Court, Southern District, New York, New York Telephone Co. vs. Prendergast. Rate Research Vol. 25, No. 11, page 165.

The pending case before the Interstate Commerce Commission is related entirely to the first of these two depreciation question, namely, how much shall street railway companies set up year by year as a reserve with which to care for the retirement of property?

The answer to this general question involves the answer to several subordinate questions which we will now consider.

What Property Needs a Reserve?

First—For what property shall a reserve be created?

The obvious answer to the question is to create a reserve for all property which must eventually be retired and to make the reserve equal to the difference between the original cost and the value of the property when retired. In other words, there will be no reserve created for land; very nearly 100 per cent reserve for cars which it is expected will be retired through obsolescence or wear, since scrap value is small, and a smaller reserve for a car which it is anticipated will be retired at an early date through inadequacy, since the resale value of such a car may be considerable.

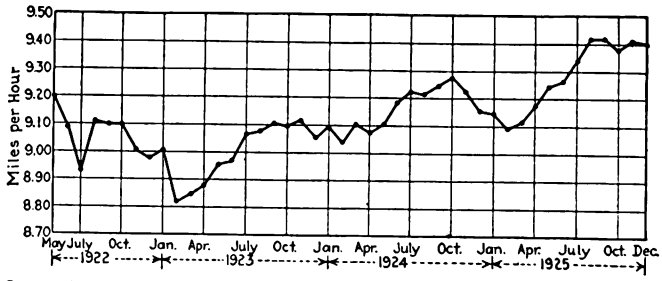
The answer to the question is not, however, so simple as it seems. Consider the trackage of a large steam railroad system. It is obviously impossible to set up a depreciation reserve for each rail or each tie. Rails and ties wear out, however, and are, as they wear, replaced from year to year. But, as a matter of fact, current repairs and current maintenance leave the system, generally speaking, with the same or a greater value at the end of each calendar year than it had at the beginning. It is true that the appropriation might be made to the depreciation reserve year by year, and the amount expended for rails and ties entered as charges against this reserve, but on a large diversified system the annual charges would approximately equal the annual appropriation, and the only practical result of the application of the depreciation theory to this trackage is a complication of the accounting requirements of the company. Considerations such as these have led the Interstate Commerce Commission, in its dealings both with the steam and with the electric lines, to make it optional with the carrier as to whether a depreciation account shall be set up for trackage; have led the depreciation section of the Interstate Commerce Commission, in its recommendations with regard to steam roads, to suggest that no depreciation reserve be set up for rails, ties and track construction, and have led the Treasury Department, through the Income Tax Division, to refuse to make any allowance for depreciation on track structure.

While this ruling is entirely satisfactory to the larger electric railway systems, which, because of their age and large total mileage, do approximately the same amount of track reconstruction work each year, it is not satisfactory to the smaller companies, and particularly to the smaller companies of recent origin. These smaller companies may run for several years without any important reconstruction program, and then be compelled to reconstruct a large percentage of their entire trackage, or, as in a case recently presented to the Income Tax Division, a new road may find itself at the end of its first life cycle compelled to face practically a 100 per cent track reconstruction program.

It is obvious that a heavy burden of this sort cannot be absorbed by operating expenses of a single year, and good business dictates that a company which foresees an expense of this sort shall accumulate out of earnings an adequate reserve.

Operating Speed Increased at Detroit

DURING the year 1925 the Department of Street Railways, City of Detroit, increased the operating speed of its cars from 9.10 m.p.h. in February to a maximum of 9.42 m.p.h. in August and September. During the fall months there was a slight retrogression. The increase in average speed is attributed by H. U. Wallace, general manager, to the electrification of switches, which were formerly manually operated; widening of certain streets and the work of the Mayor's traffic committee, which has brought about many improvements in traffic regulations. Moreover, 90 cars which formerly used storage air were equipped with compressors. Birney cars, which were formerly operated on some of the principal streets of the city, have been removed and are now used in outlying districts. It is felt by the management that a continuation of the present program will make possible a general average speed of about 10 m.p.h. The operating speed of the Department of Street Railways is shown in an accompanying chart by months from May, 1922, to November, 1925.



Operating Speed by Months of the Department of Street Railways, City of Detroit

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Pleasing appearance of passenger stations has helped to build up traffic on the Chicago, Aurora & Elgin Railroad. This shows a Chicago limited train at Wheaton

From Receivership to Prosperity in Three Years

FIRST ARTICLE

Development of Territory, Reconstruction of Track and Operation of New Cars on the Chicago, Aurora & Elgin Railroad Have Increased Transportation Revenue 65 per Cent in Three Years—Fares Are Higher on Electric Line than on Competing Steam Roads

FROM out the wreck of the receivership of the Aurora, Elgin & Chicago Railroad a new company was born in the summer of 1922 and has forged ahead rapidly since that time. The plan of reorganization was formulated by Dr. Thomas Conway, Jr., who became president of the new company, known as the Chicago, Aurora & Elgin Railroad. While considerable work had been done during the receivership to improve the physical condition of the property, it was far from being up to the standard desired by the new management. An extensive program of rehabilitation was undertaken immediately, including the reballasting of the line from Wheaton to Chicago, a distance of 25 miles; purchase of new passenger and freight equipment, construction of additional substations and improvements to passenger stations along all its lines. The resulting substantial increase in traffic has fully justified the expenditure of $1,500,000 for these improvements. The story of the development of traffic is told in this issue. Details of the track reconstruction, new rolling stock, improvements in power facilities and the development of a profitable freight business will be told in future articles in this paper.

At the time the Conway management assumed control, the property was dependent mainly upon the through business between Chicago and the five terminal cities located in the Fox River Valley, Aurora, Elgin, Batavia, Geneva and St. Charles. No sustained attention had been given to the development of the intermediate territory. The Aurora-Elgin property, as it is called, is faced with competition as keen as any to be found in the United States. The territory through which it runs is served also by the suburban lines of the Chicago & Northwestern, the Chicago, Burlington & Quincy, the Illinois Central and the Chicago, Milwaukee & St. Paul railroads, which render suburban service of the first quality, both as regards comfort and frequency. The traveling public has a free choice of using either steam or electric service, depending upon which seems most attractive. The new management decided that a rehabilitated and modernized electric railway had certain advantages, which if properly exploited would enable it to command a fair share of the competitive business. The plans, however, did not contemplate building up the Aurora-Elgin property solely by taking traffic away from the steam railroads. The objective of the new management was primarily the upbuilding of the territory served, thus creating more traffic and simultaneously increasing the prosperity of the railway and the various communities.

As soon as the work of physical rehabilitation of the property has been sufficiently advanced to constitute a

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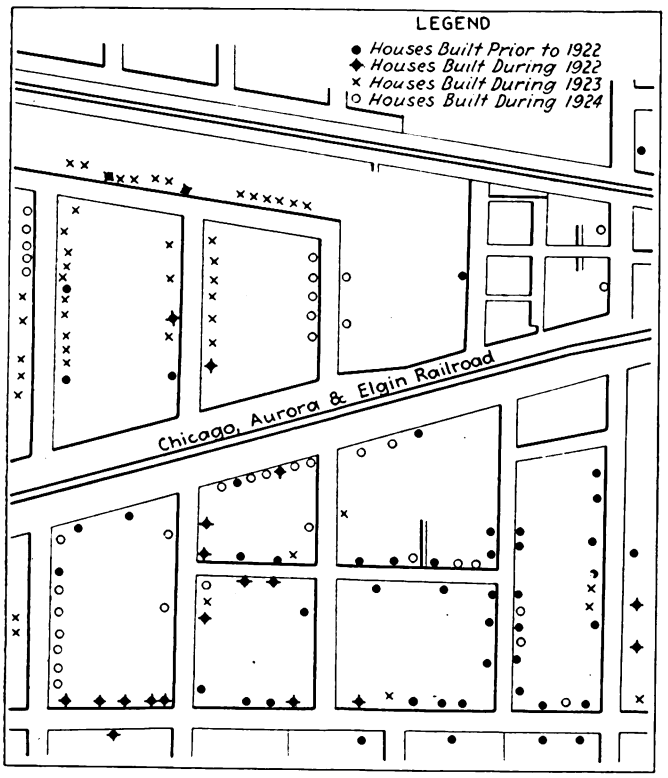
self-evident demonstration of the good faith of the new management and of its ability to carry out its promises, Dr. Conway called together all the real estate dealers and municipal officials of the several communities served by the railway, to acquaint them at first hand with the plans of the new company and enlist their support in a co-operative effort to build up the territory adjacent to the company's lines. He pointed out that in the decade



Section of Permanent Record Map Showing Houses Built Each Year Since Reorganization of the Railway

which ended in 1920 the population of the city of Chicago had increased 23.6 per cent, while the population of the suburban belt, known as Metropolitan Chicago, increased 76 per cent. The Chicago, Aurora & Elgin Railroad territory did not receive its share of the growth which occurred, because none of these suburban communities on the line showed an increase in population of as much as 76 per cent. Opportunity existed, he said, not only to attract a proportionate share of the future growth of the suburban belt but also to catch up and secure a part of the growth which should have occurred from 1910 to 1920.

Close and cordial relations were established between the management and the real estate interests and municipal officials. For the purpose of assisting in the suburban development, the Chicago, Aurora & Elgin Railroad put into effect a system of homeseekers' tickets, sold in lots of 100 to real estate agents, at rates approximately equal to the 25-ride ticket rate applicable to the same point, which averages between 1.4 cents and 1.5 cents per mile, depending upon the distance from Chicago. In a short time all of the real estate dealers in the territory were purchasing these tickets and distributing them to prospective home buyers to enable them to make inspection of the property which the dealers had to sell.

The railway believed that this ticket would not only assist in attracting people to the territory but it would also introduce them to the Aurora-Elgin service, which, if it proved acceptable, would win the new settler as a regular patron. It soon became apparent from a study of the development of the territory and the traffic of the property that the use of homeseekers' tickets constituted an almost exact index of the rate at which lots and homes were being sold. The accompanying chart shows graphically the collection (not sale) of these tickets by months from July, 1922, to the end of 1925.

From the beginning the company has given the closest attention to the rate of development of its territory, by periodically making a comprehensive and detailed survey of the situation. In July, 1922, a few days after the new management assumed control, instructions were given to the engineering department to make a detailed survey of the entire suburban territory to furnish a basis for future comparisons. The results of a house-to-house field canvass were plotted upon permanent maps, thus furnishing a permanent record of all buildings then constructed within a distance of 1 to 1½ miles on either side of the company's lines, the distance depending upon the degree to which the road might expect to attract traffic in competition with other transportation agencies. A similar field canvass was made in December, 1922. Observers were furnished with photostat copies of the original map showing the results of the July canvass, with instructions to indicate thereon all new houses. Similar checks, the results of which were compiled in like fashion, were made in December, 1923; in December, 1924, and in June and December, 1925. A portion of a typical office map showing all houses constructed in a section of the town of Villa Park from 1922 to 1924 is shown in another column.

Records of this kind have proved useful in estimating growth in traffic, in planning schedules and future cap-

COMPARATIVE INCOME STATEMENT FOR TWELVE-MONTH PERIOD ENDED JUNE 30, 1922, AND FOR CALENDAR YEARS 1922, 1923, 1924 AND 1925, CHICAGO, AURORA & ELGIN RAILROAD

	1925	1924	1923	1922	Twelve Months Ended June 30, 1922	% Inc. 1925 Over 12-Mos. Period Ended June 30, 1922	% Inc. 1925 Over 1924
Gross revenue railway operations	$2,707,616.91	$2,315,638.45	$2,184,121.93	$1,910,472.11	$1,632,815.50	65.8	16.9
Railway operating expenses, including maintenance, rentals and general taxes	2,061,442.35	1,813,374.03	1,722,795.35	1,569,197.24	1,378,859.72	49.5	13.67
Net railway operating revenue	$646,174.56	$502,264.42	$461,326.58	$341,274.87	$253,955.78	154.4	28.6
Net operating revenue from the sale of power (exclusive of power sold to Chicago Suburban Power & Light Company, included above)	.....	1,356.38	94,823.31	107,179.17	113,598.92		
Other income	30,444.57	16,820.42	8,703.76	280.57	127.44		
Total income	$676,619.13	$520,441.22	$564,853.65	$448,734.61	$367,682.14	84.0	30.0
Interest on bonds and other interest and deductions	191,653.06	203,839.21	165,414.02	126,381.75	120,430.44	59.1	
Balance available for depreciation, amortization and surplus	$484,966.07	$416,602.01	$399,439.63	$322,352.86	$247,251.70	96.1	53.1
Appropriation to renewal and replacement reserve	165,000.00	165,000.00	165,000.00	121,924.65	120,764.67		
Balance	$319,966.07	$151,602.01	$234,439.63	$200,428.21	$126,487.03	153.0	111.0

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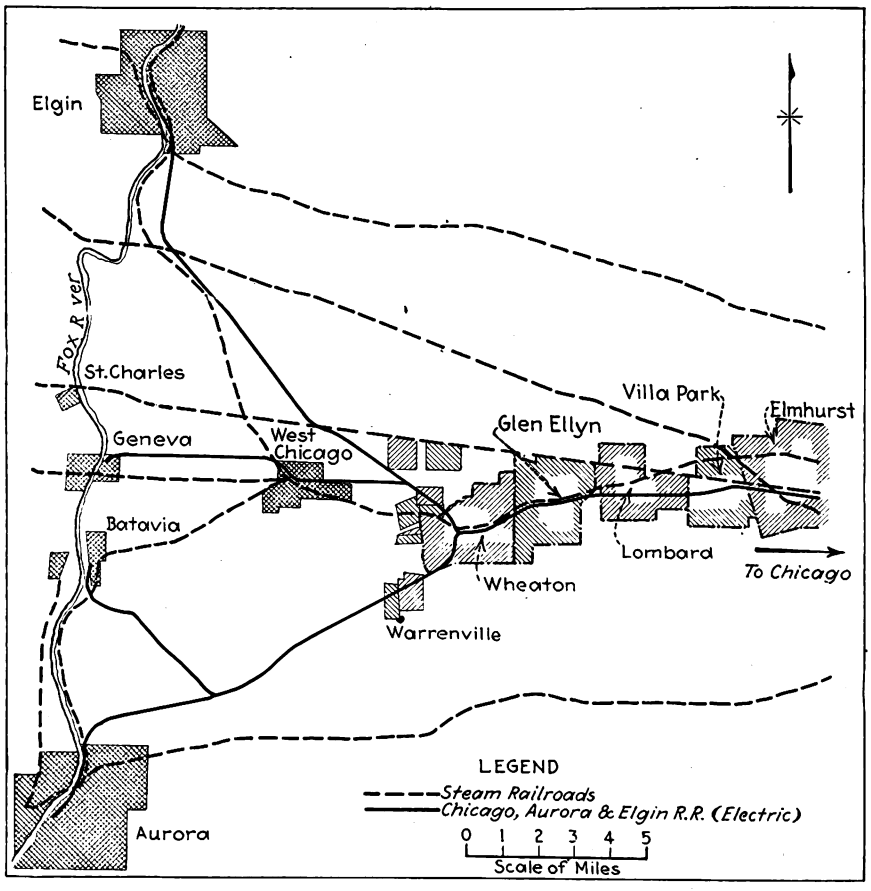
ital requirements, particularly as regards the need for additional substation capacity, rolling stock, shop facilities, etc., in outlining the annual program for crossing protection, in determining what new station facilities are required, in keeping track of the progress of real estate development and in determining whether the company was receiving its proportionate share of the growth of the business in each community.

The tabulation on page 360 shows the tremendous progress which has been made during the last four years in the development of the suburban community between Wheaton and Chicago on the main line of the Chicago, Aurora & Elgin. The per cent increase in the number of houses in each suburban town for each year over the number of houses in existence at the end of the preceding year is given.

Perusal of this tabulation shows that the increase in the number of houses in the various suburban communities from July 1, 1922, to Dec. 31, 1925, has ranged from 53 per cent to 379 per cent. Through the territory as a whole, the average increase in the number of houses within the area tributary to the lines of the Chicago, Aurora & Elgin Railroad over the 3½-year period has been 136 per cent.

In consequence of the close cooperation established between the real estate developers and the management, it has been possible regularly to secure from many of the former the names and addresses of home buyers about to settle in the territory. These prospective customers have been promptly added to the mailing list of the Aurora-Elgin and effective publicity literature has been sent to them. The advantages of the electric service and ticket rates prevailing have been called to the attention of the new residents at or shortly after the time they move into the community.



Suburban Territory Served by the Aurora-Elgin Lines. Shaded Areas of Communities Between Wheaton and Chicago Are Developments of Past 3½ Years

All ticket agents are required to report monthly the names of persons who for the first time have appeared on their records as purchasers of commutation tickets. A personal letter is written by J. H. McClure, general manager, to each new commuter, welcoming him as a patron of the company, expressing the hope that he will find the service satisfactory and that if he has any complaints or suggestions to make he will do the company the favor of giving it the benefit of his opinion. This letter also calls attention to the ten and 25-ride tickets sold by the company and their uses and advantages to the other members of the family. It has been found that these letters give a personal touch to the relationship between the management and the new commuters, as evidenced by hundreds of letters written by the recipients of such communications and many valuable suggestions that have been made by them.

Ticket agents of the company are also required to report each month the names of all commuters who purchased tickets in the preceding month, but who do not appear in the records as having purchased monthly tickets for the period in question. A representative of the transportation department is immediately assigned personally to interview these individuals and to report results of this interview to the general manager. Many discourtesies or lapses in service have been brought to the attention of the general manager. In a large majority of these cases, personal interviews resulted in ironing out the irritations of passengers and in winning back the business temporarily lost. The knowledge that every passenger who discontinued the use of the line would be interviewed by a representative of the management and a written report made thereon has had a salutary effect in promoting uniform courtesy and thoughtfulness on the part of the trainmen.

Unlike many electric railways whose fares are lower than those of competing steam carriers, the rates on the Chicago, Aurora & Elgin Railroad between Chicago and most of the suburban towns were substantially higher than those which prevailed upon the lines of its competitors before the increase made by the latter in December, 1925. The ten-ride ticket rates prevailing between Maywood and Wheaton on the one hand and Chicago on the other have ranged from 15 per cent to 35 per cent higher than those on the steam lines. The 25-ride ticket rate has been from 28 per cent to 35 per cent higher than similar rates on the steam lines.

It was believed by the management that if a superior standard of service could be established business would be attracted to the electric railway at higher rates than those charged by its competitors. Moreover, it has been well known for years that the steam railroads operating out of Chicago were running suburban service at a loss. The present management of the Aurora-Elgin decided

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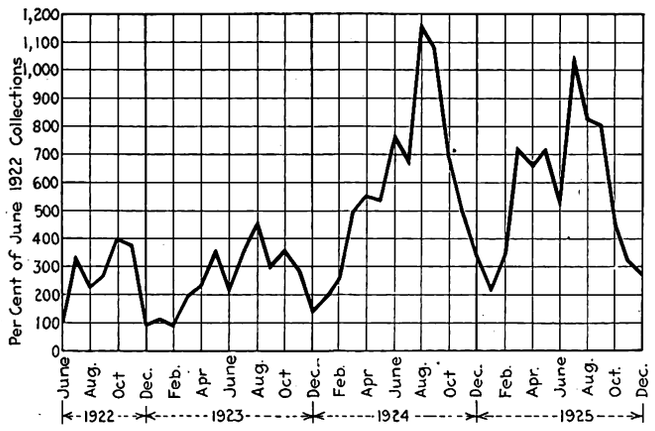


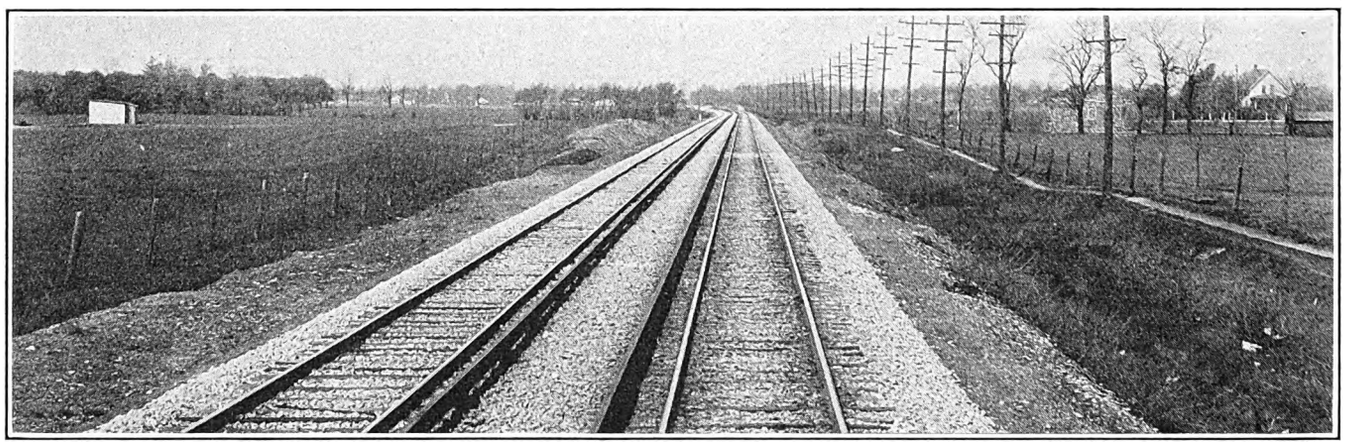
Collection of Homeseekers' Tickets Has Been Found to Be an Accurate Index of the Development of the Suburban Territory Served by the Railway

that traffic to be worth while must pay reasonable rates, and it therefore determined not to inaugurate any new fares at the ruinous figures prevailing upon the steam lines. Faith in the ability of good service to attract patronage has been justified by the fact that railway operating revenues have increased more than 65 per cent in three years, while railway operating expenses, including maintenance, rentals and general taxes, increased only 49½ per cent. Net earnings from railway operations have increased more than 154 per cent in 3½ years. Percentages of total traffic handled by the Aurora-Elgin from various towns, passenger revenue by month and a summary of revenues and expenses by year are shown in accompanying tables.

The company has recently marketed successfully a $5,000,000 bond issue, involving the purchase in the open market of more than 90 per cent of an underlying bond issue secured by a closed non-callable mortgage. The old bonds were deposited under a new first and refunding mortgage. The new $5,000,000 25-year, 6 per cent bond issue provides funds for the retirement of the 7 per cent, series A, refunding and improvement bonds issued at the time of the reorganization, and also for an issue of $750,000 in two-year, 6½ per cent notes sold in December, 1924. It provides also a substantial amount of new capital for additions and betterments to be made in the near future. Provision is made for future necessary junior financing through the creation of a prior preferred stock issue and the issuance at this time of $500,000 of such stock.

Municipalities through which this road operates have been growing so rapidly that frequent schedule changes have been necessary in order that adequate service should be furnished. A new schedule has recently been completed which calls for 221 passenger trains per day, divided into three different classes, limited, express and local. This is a slight increase over the previous winter schedule and provides a headway varying from ten minutes to 30 minutes during the entire day for municipalities within a distance of 26 miles of the Loop district of Chicago. Such service enables patrons living in Wheaton, a distance of 25 miles from the Loop district of Chicago, to reach their destinations within the same time or in even less time than they would be able to were they living in certain parts of the city of Chicago.

Running time between Wheaton and Chicago is 45 minutes on limited trains and one hour on local trains. The intervening municipalities are reached in proportionally less time. During the morning and evening rush hours this schedule provides for limited trains every twenty minutes, or less, between Chicago and the western terminals of Aurora, Elgin, Geneva, St. Charles and Batavia, and an hourly limited service to each western terminal the balance of the day. Elgin is more than 41 miles from the Chicago terminal and the total running time of the fastest trains from Chicago to Elgin is 65 minutes. Twenty-six minutes is consumed in going out over the elevated structure to the end of



Well-Maintained Rock-Ballasted Track Permits High-Speed Operation

INCREASE IN HOUSES, IN TOWNS AND VILLAGES CONTIGUOUS TO THE CHICAGO, AURORA & ELGIN RAILROAD, WHEATON TO MAYWOOD

	Wheaton, Per Cent	Glen Ellyn, Per Cent	Lombard, Per Cent	Villa Park and Ardmore, Per Cent	West Elmhurst to Stratford Hills, Per Cent	Total, Per Cent
1922 over 1921	14.5	24.5	24.9	43.5	19.8	22.2
1923 over 1922	9.1	18.4	22.1	52.3	19.3	20.0
1924 over 1923	7.3	19.2	27.2	52.8	23.2	22.4
1925 over 1924	14.4	32.2	32.8	43.7	41.3	31.3
Cumulative 1925 over 1921	53	133	157	379	148	136

Boarding or Alighting at	Percentage of Total Traffic Handled by the Aurora-Elgin 1922	1925
Elgin	59.8	69.2
Geneva	25.9	40.1
Wheaton	39.9	61.0
Glen Ellyn	48.2	57.3
Lombard	55.2	68.6
Elmhurst	16.3	32.8

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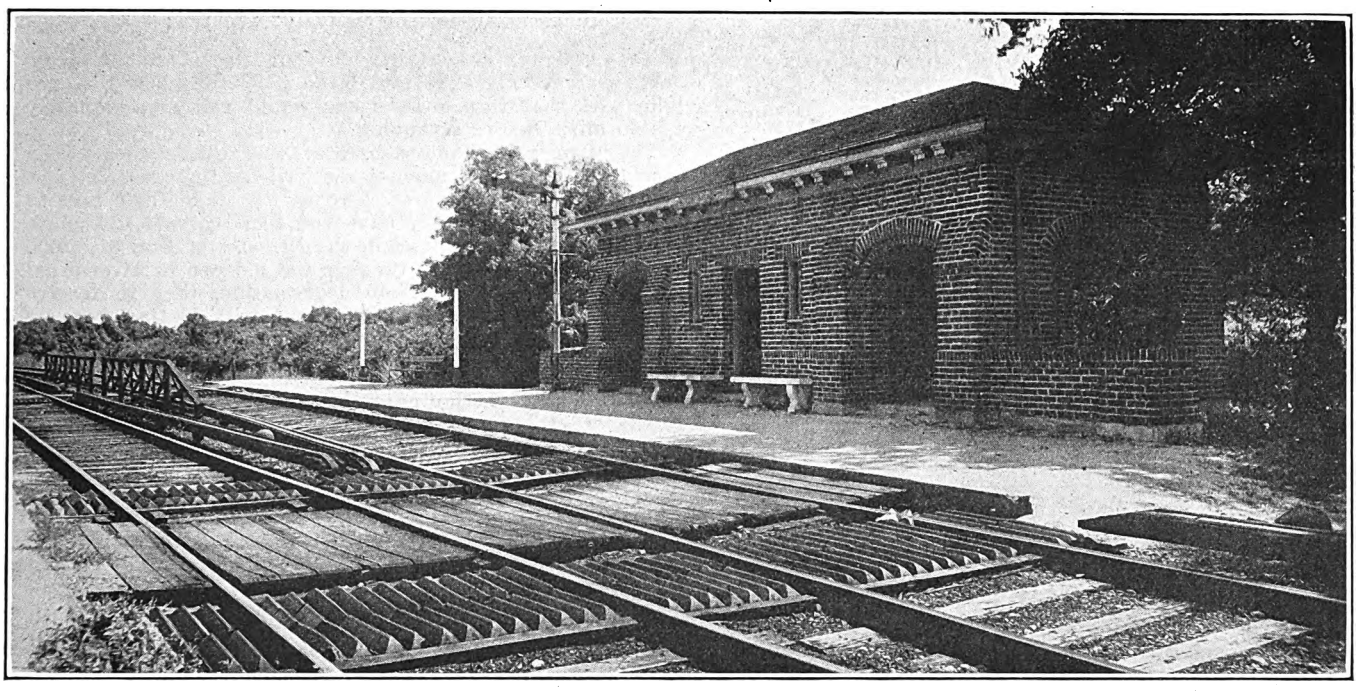


Attractive Brick Station at Chicago Golf Club on the Aurora Branch

joint operation at Forest Park, a distance of 9 miles. The remaining 32 miles is run in 39 minutes, including stops to take on and discharge passengers at Lombard, Wheaton and Glen Ellyn.

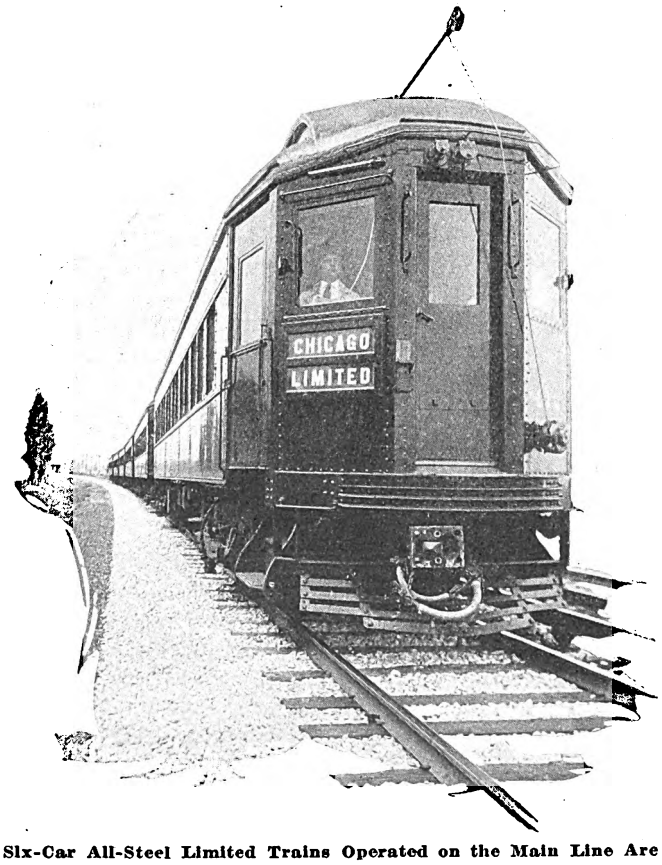
In spite of these most difficult operating standards an analysis shows that of the total number of trains operated under the present schedule, approximately 100 per cent depart from their terminals on time, and that 95 per cent of them arrive at their destinations on time or less than three minutes late.

Below is a list showing the number of trains operating between Chicago and the larger municipalities along the road:

Stations Between	Miles from Chicago	Number of Trains
Maywood and Chicago	11	95
Bellwood	13	90
Berkley	14	90
Elmhurst	16	91
Villa Park	18	86
Lombard	20	141
Glen Ellyn	23	143
Wheaton	26	144
Geneva	37	34
St. Charles	40	34
Batavia	40	50
Aurora	40	52
Elgin	42	49

Wheaton, Glen Ellyn and Lombard enjoy service which provides 71 trains daily to the Chicago Loop and 73 trains outbound daily from the Loop, this service being operated from 5:45 to 1:30 a.m. Thirty-eight of the 73 trains are fast expresses. In the rush hours these communities enjoy a service approximating a 7½-minute headway. At the east end of the Aurora-Elgin line, where there is a convergence of the fast high-speed limited trains from the Fox River terminal cities, the Wheaton expresses and the Elmhurst short service there now is a train on the average of every 3½ minutes in the direction of heaviest travel, these trains ranging in length from two to six cars each.

Trains operating into and out of the Wells Street Terminal, Chicago, are made up of two to six cars each. In cases where more than six cars are operated, the trains are run in sections, due to the present platform limitations in Chicago. During the summer months, in addition to the regular scheduled trains, excursions ranging from 60 to 120 cars each are operated between Chicago and the park owned and operated by the company in the Fox River Valley.



Six-Car All-Steel Limited Trains Operated on the Main Line Are Run in Three-Car Sections on Aurora and Elgin Branches

The company has capitalized its natural advantages in popularizing its service. In its advertising literature it has continuously featured "No Smoke, No Dust, No Cinders" and has constantly called to the attention of the people in the communities served the remarkable accessibility of its Chicago terminal as compared with those of the steam railroads and the ability of passengers to change under cover and without walking up or down stairs from Aurora-Elgin trains to elevated trains, taking them to any department store or most business establishments or places of amusements in the Loop district of Chicago without setting foot in the street.

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RECORD OF PASSENGER REVENUES BY MONTHS

	1922	1923	1924	1925
January	.....	$126,988.58	$132,643.25	$149,011.26
February	.....	109,022.48	125,600.91	133,259.93
March	.....	122,951.70	137,172.30	143,676.82
April	.....	131,406.62	140,052.71	149,478.47
May	.....	155,092.68	164,222.16	175,388.65
June	.....	158,081.20	158,236.75	173,140.55
July	$163,599.29	174,809.50	173,981.65	179,920.47
August	164,427.63	176,490.23	177,800.94	187,382.04
September	145,037.74	158,908.83	159,934.14	166,787.56
October	139,147.59	143,694.39	154,521.47	160,552.54
November	130,709.52	140,849.78	151,900.52	164,335.84
December	138,223.80	146,716.09	152,008.65	168,641.72
Totals	$881,145.57	$1,745,012.08	$1,828,075.45	$1,951,575.85

Great emphasis has been placed upon the cleanliness of the cars, keeping the seats in first class repair and condition, spotless toilets and other like features demanded by a discriminating public.

STATIONS HAVE BEEN MODERNIZED

The management has carried out a program of thorough rehabilitation and modernization of its terminal stations in Aurora, Batavia, Geneva, St. Charles and Elgin and has painted and put into first class condition all other passenger stations. Lately a new brick station has been built at Seventeenth Avenue, Maywood, and the company is now constructing an artistic passenger station at Glen Ellyn.

These are the more important principles evolved and applied by the management in building up the passenger traffic of the property. The faith shown in the ability of an electric railway to hold its own in competition with steam railroads of the highest class when the most modern type of facilities are provided and modern methods of operation and improvements in service are employed has been strikingly justified.

Railway Turns Tables on Auto Dealers

SOME time ago the Mobile Light & Railroad Company published an advertisement in the local papers calling attention to the expense of using private automobiles for business and the economy of street car riding. An article by R. S. Kellogg, secretary of the News Print Service Bureau, published in the *Nation's Business* was quoted showing automobile operating costs, as follows:

	Car 1	Car 2	Car 3
Cost of car	$792.90	$1,379.74	$2,238.22
Mileage	14,000	13,494	33,100
Years used	2.5	3.16	3.71
Depreciation per mile, cents	3.0	4.9	5.0
Repairs, upkeep, etc., per mile	2.6	4.7	2.0
Tires per mile	2.0	2.4	1.9
Insurance, licenses, etc., per mile	1.5	2.4	1.6
Gasoline	1.5	1.9	1.0
Garage	.4	1.7	1.0
Total, cents	11.0	18.0	12.5

Ford dealers in Mobile came back at the railway with an advertisement stating that a Ford can be operated for 3.92 cents per mile. This figure was arrived at by the following calculation:

Fire and theft insurance	$12.00
Liability and property damage insurance	29.40
License	12.00
Taxes	12.00
Tires	84.00
Gasoline	201.60
Oil	39.60
Mechanical and oiling	72.00
Battery	13.80
Depreciation	125.40
Total operating cost	$601.80
Miles run	15,120
Cost per mile, cents	3.92

Not to be outdone, the railway retorted:

We challenge the statement that the depreciation on said car was only $125 for 15,120 miles, or $0.0082 + per mile. At that rate a Ford car would run approximately 62,445 miles before scrapping.

The depreciation on a car is the difference between original cost and the amount received for the car after use.

We advise all owners of Ford cars to take their cars to a Ford agent, after they have run their cars 15,120 miles, and show the agent his ad in the *Register* of Oct. 31, 1925, and demand a new car, turning the old car in at original cost of $516.35 less $125.40 depreciation, they to receive $390.95 for the old car. The agent will do this, because he advertises the depreciation is only $125.40 on a Ford for 15,120 miles.

The result of the controversy was that the automobile dealers were overrun with people demanding an exchange at the figure mentioned in the advertisement. This they were not prepared to do and consequently were compelled to acknowledge their mistake in publishing the figures.

Parking Restrictions Speed Up Cars and Aid Retail Trade

CHECKS made by the research department of the Pittsburgh Railways show that there has been a substantial reduction in the running time of street cars since the new parking restrictions have been in effect in the downtown district. Detailed information concerning these regulations was published in ELECTRIC RAILWAY JOURNAL for May 30, 1925, page 847. Time saved by cars routed over various loops is shown in the accompanying table.

TIME SAVED BY CARS ROUTED OVER VARIOUS LOOPS

Loop Number	Number of Cars During Maximum Hour	Average Decrease in Time, Minutes
1	26	1:01
2	84	2:47
3	81	3:51
4	27	5:21
5	57	2:55
6	23	:25
7	20	:56
8	52	:35
9	159	3:17

It is significant also that retail trade in the downtown district has prospered more than that in the outlying sections since the change was made. Comparisons are given below of the buying power of the Pittsburgh district, as represented by bank payrolls in 1924 and 1925; retail sales for the entire district and downtown sales, as represented by seven large department stores.

Three Months Ended	Buying Power, Per Cent	Retail Trade: Entire District, Per Cent	Retail Trade: Downtown, Per Cent
March 31	—9.01	—1.87	—2.53
June 30	—1.77	—5.90	—2.37
Sept. 30	—3.67	—6.20	—2.77
Dec. 31	—8.13	+1.50	+3.47
Year	—5.72	—2.80	—0.80

Industrial depression resulted in a slight decrease in buying power and trade, but the decrease in the downtown section, 0.8 per cent, was much less than that of the district as a whole, which was 2.8 per cent. The fear expressed by some downtown merchants that their business would be injured by the stringent parking regulations appears to have been without foundation.

Earnings of the Pittsburgh Railways decreased 1.67 per cent as compared with a decrease of 5.72 per cent in buying power for the district.

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Impressions of European Tramways

Conditions and Practices in Several Continental Cities Indicate that in Some Essential Things, Such as Courtesy, the Europeans Excel—Short Four-Wheeled Cars Are Standard Nearly Everywhere, but Operation Is Almost Noiseless—Few Abandonments of Tramway Lines Noted, but the Bus Is a Factor in Extensions

By James A. Emery
Vice-President Ford, Bacon & Davis, Inc., New York

The Royal Exchange, London, a Heavy Traffic Point. Tramways Do Not Operate in This Part of the Business District

Mr. Emery's observations were made on a somewhat hasty pleasure trip through England, Belgium, Holland, western and southern Germany, Austria, Italy, Switzerland and France. No attempt was made to study the urban transportation situation, so that only such matters are covered as naturally attract the notice of one interested in the business.
—EDITOR

CITY transportation systems abroad appear to be in much better shape than other lines of industry. On the Continent, particularly, tramway cars are noticeably crowded; that is, carrying many standing passengers, even during off hours. The general condition of the physical property is good. Cars are clean and well painted, and track, with a few exceptions, is excellent. The large traffic volume can probably be ascribed to the movement of population from country to city that has taken place since the war in spite of unemployment. The physical condition is undoubtedly due to good habits of maintenance, high standards of design and cheap labor.

It is hardly likely, notwithstanding good appearances, that the tramway lines are generally prosperous, as fares are very low measured by our standards, for rides of average length. In a large proportion of European cities the tramways are owned and operated by the municipalities, so that the necessity of paying all expenses and a satisfactory return on the investment is not so urgent as with private companies.

The zone system of fares is very common, and as the platforms are open the conductor is a busy man. He wears a little satchel or wallet for his tickets and change and gives every passenger a punched ticket or receipt, which, however, is not collected when the passenger leaves the car. In Vienna, and probably in some other cities, a monthly pass is sold for about $3.25 (U. S. equivalent).

It is probably in part due to the zone fare system that the use of one-man cars has not been attempted to any great extent.

In England the traffic is noticeably lighter than on the Continent, but municipal systems, particularly in London, seem to be operating more service than the volume of traffic warrants. This may be due to the unemployment situation. The London tramways are

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said to be hardly earning their working (operating) expenses.

Tramways are not permitted in the inner or principal business sections of London and Paris.

To an American the prevalence of narrow gage track is interesting. Perhaps two out of every three systems are narrow gage, 3 ft. in Great Britain and 1 m. (39.38 in.) on the Continent. Narrow grooved rail is universally used in paved streets. The substructure is integral or identical with the paving base, and the rails are held by steel ties or cast-iron chairs imbedded in the concrete base and spaced about 5 ft. apart. Heavy flat tie rods are used and no joint welding was observed, although it is understood that welding has been practiced to some extent. As the wheel loads are light this construction preserves its line and surface for a long time, and if it goes bad, repairs are made at once so that there is very little rough track or paving in evidence.

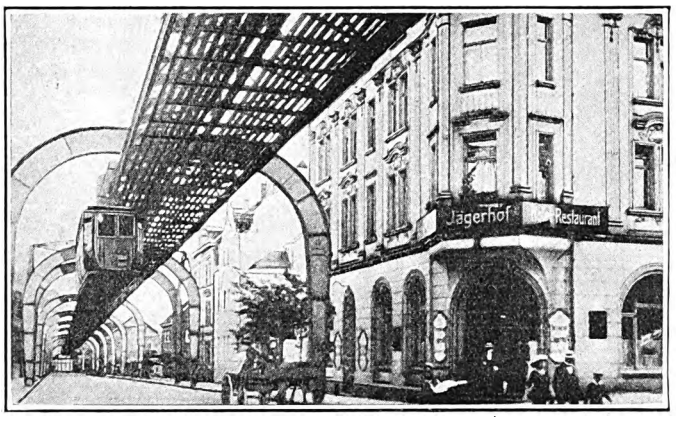
Overhead wires are kept in first-class shape. Nothing is used but steel or iron for poles and structural or built-up poles are common. Concrete protection for poles around the base is often seen. Sliding contacts are used almost altogether on the Continent instead of trolley wheels. In the zones immediately surrounding the inner sections of London and Paris there is much slot construction, and in Paris the slot is formed along the inner side of one of the running rails.

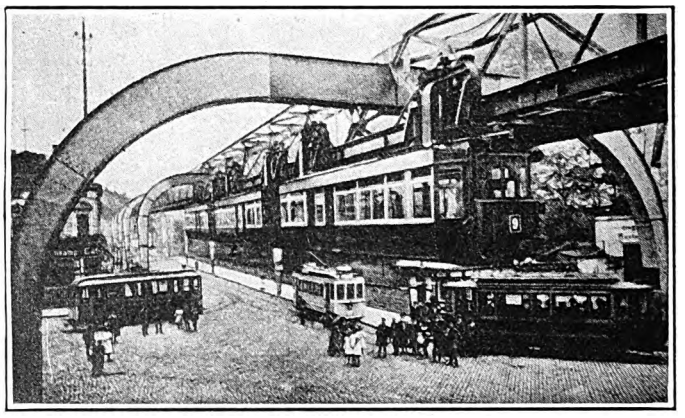
Short four-wheeled cars are standard nearly everywhere on the Continent, with a notable exception in Paris, and in the larger cities they are operated in trains all day long with one motor car and from one to three trailers. Some of the trailers are very light with very small wheels and low floors. In Great Britain double-deck cars are used on all the larger systems. The stairs lead up from the rear platform and the upper deck is inclosed. On the Continent they have a fancy for delicate colors. Such colors would be fantastic in our cities, but in the clean, picturesque European streets they are rather pleasing and not at all out of place. Of course it is necessary to keep such paint clean, and the paint and varnish must be well looked after. The finish often looks like a furniture job.

Compared with American operation, the cars are almost noiseless. While much of the credit for this is due the track, yet it speaks for close fits and frequent tightening of all truck parts and for close attention to gears and pinions.

There are no inclosed platforms on city cars. This, together with operation in very narrow streets, would seem to look bad for the accident account, but it is probably not as important with them as it would be with us. In some streets the rail cannot be more than 3 ft. from the building line. Street traffic even in London is nothing like as great a problem as it is with us, because automobiles have not come into such general use. In Rome, for example, a city of 900,000 population, there are very few traffic policemen. Pedestrians seem to be more wary than here, for automobiles and taxicabs go tearing through the narrow streets tooting their horns most urgently, but nothing happens.

Next to their standards of maintenance the most important particular in which European tramways excel ours is in route signs. All routes are numbered. The numbers show in big figures on the signs and are so well advertised that every one is familiar with them. In addition, the destination and generally the principal streets operated on are named on the outside signs. Inside, the complete route and rates of fare are conspicuously displayed. In the subways each car carries several large cards showing the line diagrammatically with every station and transfer point. In the subway stations the signs are so complete that it is not necessary for the stranger to ask a single question. Folders and small scale maps are widely distributed describing the routes in detail and giving directions for reaching all points of interest. The routes are so well advertised that the public, particularly hotel people and policemen, are surprisingly familiar with them. In London and Paris stopping points are indicated by neat, distinctive signs.





Suspended Railway Running from Vohwinkle to Barmen in the Rhine District of Germany

On the Continent buses are not used to any extent, except in the largest cities. This is probably due to municipal operation of so many tramways and to lack of funds. In England bus lines are fairly common in the principal cities, but do not seem to be permitted to poach on the tramways to the extent that they have done in London.

Of much interest to an electric railway man is the extensive program of electrification of steam railway lines that is in progress. A large portion of the suburban service around London and Paris has been electrified, and in Switzerland and the mountain districts of Italy where coal is dear and water power plentiful much work is going on.

Tramway men acknowledge that future extensions of service will have to be provided for by buses as the cost of tramway construction is prohibitive as compared with bus installation.

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There has been very little abandonment of tramway lines and no cases of bus substitution came to notice.

The suspended railway (Schwebebahn) running from Vohwinkle through Elberfeld to Barmen in the lower Rhine country is a novel and interesting system of transit. The cars are suspended by gooseneck hangers from a single rail, there being two hangers per car, each attached with motor to a two-wheel truck. The rails are carried by latticed trusses running longitudinally and hung on cross-frames shaped like an inverted U or V. The line is about 6 miles long and the greater part of it is located over the Wupper River, a small stream from 100 to 120 ft. wide. The river bed is very crooked so that the railway alignment is a succession of curves. This, together with the frequent stations, results in a rather low average rate of speed. There is an intensive industrial development all along the line, so that two-car trains were well filled on five-minute headway during off-peak hours.

This suspended railway has been in operation for over 25 years, so that its practicability is well proved. It is much less costly to build than an elevated railway of standard type and makes comparatively little obstruction. It has favorable operating features in point of comfort, quietness and minimum stair climbing. In view of the apparent success of this system, from a technical standpoint, and its several advantages, it seems singular that it has not been used or seriously considered in many cities where rapid transit is needed but where the traffic is not heavy enough to support a subway or elevated line of standard type.

While definite conclusions can hardly be drawn from "horseback" observations, it seems fairly clear that European tramways are far ahead of American in car signs, advertising, maintenance standards and courtesy of operatives. They have made a quicker "comeback" since the war than other industries so far as volume is concerned, but in spite of this they are not earning cost of service, so that a part of their support must be coming out of general local taxes. Future extensions will be taken care of by buses. Municipal operation is apparently efficient under European conditions in so far as quality of service is concerned.

Wages on European Electric Railways

WAGES paid to motormen and conductors on the tramways in Europe are far less than those prevalent in this country. Statistics giving information up to date on European wages were presented in a report at a meeting held in Brussels in July, 1925, of the personnel connected with European tramway companies. This report gives for all the principal European countries the average hours per week or per day of the employees in the transportation and maintenance service, with wages paid, accident and sick benefits awarded, and other similar information.

In Great Britain a motorman is paid somewhat more than a conductor and averages, according to the size of the city, from $12.84 to $15.24 a week. These wages are based on a standard week of from 48 to 52 hours. The conductors get about a dollar less per week. These statistics are taken from the reports of 142 tramway systems, of which 90 are municipally owned and 52 under private operation. The tramways in Great Britain employ more than 50,000 persons, of whom 12,620 are employed in London.

In Holland there are nine tramway systems, of which five are municipal, and the transportation employees in Holland earn from 30 to 40 kronen a week, or from $12 to $16. They work from eight to eleven hours per day.

In Italy the wages are considerably lower. For transportation employees they average 780 lire, or about $28 per month, and the men work from 8½ to twelve hours a day. Italy has 44 city tramway systems, with about 30,000 employees.

In Sweden the wages of the men seem to be as high as anywhere in Europe. That country has eleven tramway enterprises, of which eight are municipal, and 2,402 men are employed. Forty-eight hours a week is the standard period of work and the wages average from $54.67 a month in the small towns to $72.36 in Stockholm. After about twelve years of service a man in the small town can work up to a monthly wage of $67.80, while the motorman in Stockholm can expect $89.80 a month after twelve years of service.

There is only one railway system in Alsace-Lorraine, that in Strassburg. The men make from $21.18 to $24.75 per month. Married men get $2.50 more a month, as well as 75 cents a month extra for each child under fifteen years. Overtime is paid at the rate of 14 cents an hour before midnight and 24 cents an hour after 12 p.m.

Accident Record Good in St. Louis

ACCIDENTS for the year 1925 on the lines of the United Railways, St. Louis, numbered 19,171, which is the lowest figure of the last four years. Of this total 10,775, or 56.2 per cent, were collisions with other vehicles. This, the largest class of accidents, has grown steadily from 323 in 1907 to a maximum of 12,609 in 1923. Starting organized safety work in 1924, the company was able to check the increase and accomplish substantial decreases in 1924 and 1925. This has been done despite the fact that the number of motor vehicles in St. Louis has increased from 80,556 in 1923 to approximately 150,000 at the present time. Except for the item of collisions with motor vehicles, the accident record of the railway for 1925 is the lowest in the nineteen years, beginning with 1907, for which records are available. All other accidents total 8,396, as compared with a maximum of 22,167 in 1909.

Accidents for the past year are classified as follows:

Type of Accidents	Number
Collisions with wagons	444
Collisions with persons	531
Collisions with animals	41
Car collisions	270
Car derailments	130
Boarding and alighting	2,046
Falls in car	951
Disturbances	534
Car equipment failures	42
Miscellaneous	1,966
Transportation employees injured	115
Power plant and line employees injured	216
Maintenance of way injuries	419
Shop injuries	307
Electrolysis	31
Struck by car doors	353

Fatal accidents in which the United Railways was involved numbered 31. The low record of fatalities occurred in 1920 with 25, and the high record in 1910 with 70. Car-miles numbered 2,465 and passengers carried 23,831 per transportation accident in 1925. Per passenger injury, the car-miles averaged 11,542 and the number of passengers carried 111,595.

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Association News & Discussions

Diesel-Electric Locomotives Discussed in Joint New York Meeting

SOMEWHAT conflicting views were presented at the meeting held in New York on Feb. 18 when the Metropolitan Sections of the four great engineering societies—civil, electrical, mechanical and mining and metallurgical—met to discuss the Diesel engine and its effect on heavy traction. This is not strange because the Diesel locomotive is a newcomer in the railroad field.

C. A. Stein, general manager Central Railroad of New Jersey, was the first speaker. Progress of the steam locomotive was depicted in stating that the present locomotives are 34 times as heavy and 52 times as efficient as the first 8-ton, 2,000-lb. tractive effort locomotives used in the United States in 1829, almost 100 years ago. For the first 70 years the railroads expanded and grew in size, but made few changes in the design of the steam engine used for propelling the locomotive. Since 1900, however, many improvements have been made, until now almost too many things are placed on the locomotive. Mr. Stein inferred that the steam locomotive has almost reached the limit of its development.

The speaker mentioned several objections to electrification, the first and principal one being its high cost. He feels also that there is a danger in the third rail and the high voltage overhead trolley. Sleet and ice have proved a real interference to third rail operation and also, to some extent, to overhead trolley. Troubles at the power house and on the transmission lines cripple electric operation of the entire zone rather than of one unit only. While the thermal efficiency of the electric engine is greater than that of the steam locomotive, he believes that it is not as efficient as the Diesel engine. The Diesel engine undoubtedly will find an important place in steam road operation, particularly in terminals, whether electrified or not, until one standard system of railway electrification can be determined upon.

The Central Railroad of New Jersey is operating one Diesel locomotive in its Bronx terminal. It is self-contained, requiring no heavy investment to provide for peak conditions. One unit is just as efficient as it would be if Diesel locomotives were used throughout. In other words, a changeover from steam to Diesel engine can be made gradually, as conditions warrant.

High grade mechanics are not necessary in Diesel engine maintenance, according to the speaker. In common with electrification, the steam road is freed of water tanks, cooling stations, water scoops, ash-handling equipment and other similar necessities to steam locomotives. This one Diesel locomotive operating in the Bronx yards has a fuel cost of only one-fifth that of the steam locomotive it replaced, because on account of smoke reduction the steam locomotive had been burning anthracite at $8 a ton. Mr. Stein feels that the Diesel-electric or oil-electric locomotive is going to find a very definite place in steam road operation and will be a considerable competitor to electrification.

Hart Cooke, of the McIntosh-Seymour Corporation, stated the case for the Diesel locomotive. Mr. Cooke's paper is abstracted elsewhere in this issue.

Electrification Favored by Mr. Storer

N. W. Storer, general engineer Westinghouse Electric & Manufacturing Company, delivered an outstanding paper in favor of electrification. Mr. Storer's paper will be found elsewhere in this issue.

Edward B. Katté, chief engineer electric traction New York Central Railroad, read into the records a few remarks, reproduced elsewhere, and showed several tractive effort curves of the freight and the passenger Diesel locomotives designed for the New York Central, in comparison with steam locomotives. These are the first Diesel locomotives used in this country for road service.

W. B. Potter, chief engineer railway department, General Electric Company, in a brief discussion, said that the electrical engineer must think of electrification in the terms of transportation. The speaker has long been interested in both electrification and internal combustion engines, and while he believes that the Diesel locomotive will find an important place in steam road operation, because of its high thermal efficiency, he sees no fear for heavy electrification of trunk lines because of this unit. Mr. Potter looks forward to the future of steam road operation as being capable of absorbing all of these forms of locomotion in their proper place.

Sidney Withington, electrical engineer New York, New Haven & Hartford Railroad, rose to the defense of the electrical operation of his road between New York and New Haven, saying that its reliability had been greater than under steam locomotive conditions, despite the dependability upon a power station and transmission line. Also, he is not alarmed as to the personal injury possibilities mentioned by one of the other speakers, saying that it is only a matter of education to warn people of the dangers of the third rail and the high-tension trolley. During the shopmen's strike a few years ago it was a very significant fact that the electric locomotives were better maintained by the unskilled labor available than were the steam locomotives, an important point in favor of electric locomotive operation.

Mr. Withington said that the system of electrical operation should be standardized, particularly in the East, where the steam roads of one company come in contact with others so frequently that it would be an annoyance and an expense if many of these other roads were electrified by different systems.

Even in the congested districts in New York the sum of all rated power of the New Haven electric locomotives is four times the capacity of the power house, indicating clearly the effect of the diversity factor. Diesel locomotives would be more expensive, not only because of the greater expense of the Diesel engine per horsepower, but because it would be necessary to supply so much more generating capacity than would be possible under full electrification operated from central power stations. Likewise, the future oil supply may seriously affect the economic status of the Diesel engine in the future, in the opinion of Mr. Withington.

W. S. Murray said that the final answer was an economic one, and that the annual charge composed of the two factors, one of operating and the other of fixed charges, must determine the usefulness of any type of locomotion. He has little fear for electrification as a whole, but sees an opportunity to use the Diesel engine in yards, branch lines, and perhaps on road work on long light lines that do not require heavy trains and are not encumbered by heavy grades.

Several others discussed various points that were raised by the speakers. The entire meeting showed a great interest in the subject and a desire for some type of engine to replace the steam locomotive under conditions that are not favorable to its operation and maintenance.

The Diesel Locomotive Must Prove Itself*

By E. B. Katté
Chief Engineer Electric Traction
New York Central Railroad

SUCH a locomotive as the Diesel should promote the extension of heavy electric traction in that it may be considered a competitor of the electric locomotive in certain fields, and as such, should tend to reduce the cost of electric locomotives.

The most promising field for the Diesel locomotive is in switching service in non-electrified yards, or between yards operated under different systems of electrification; also on railroads

*Abstract of discussion before a joint meeting of A.S.C.E., A.S.M.E., A.I.E.E., and A.I.M.&M.E., New York City, Feb. 19, 1926.

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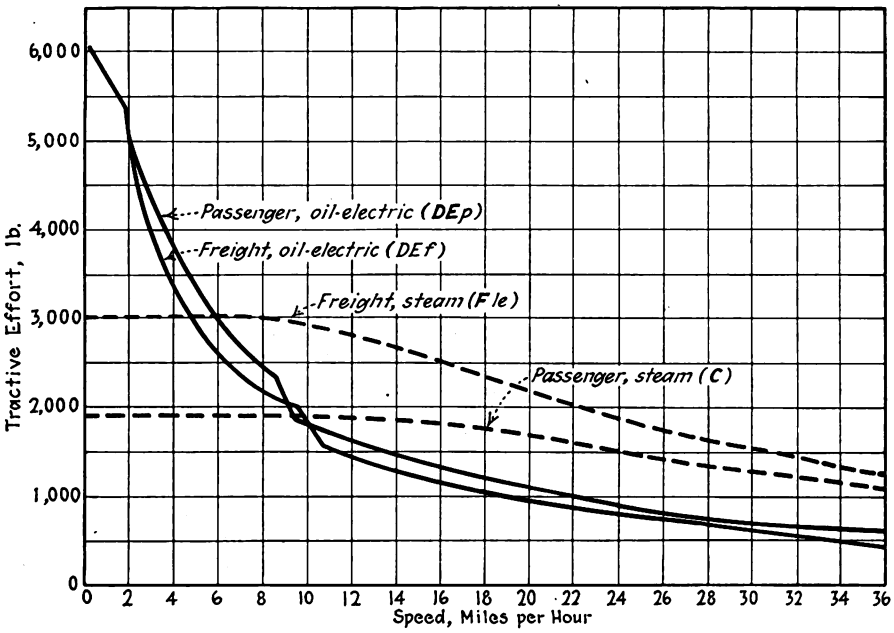
with relatively infrequent service, or on branch lines where the traffic is not heavy enough to provide an operating saving sufficiently large to cover the increased fixed charges incident to electrification. To compete successfully in either of these fields the Diesel locomotive must operate practically noiselessly and smokelessly; the economy in operation must at least equal that of the electric locomotive and the first cost must be less than the combined cost of the electric locomotive and the working conductors.

During the preliminary exposition of the advantages of the Diesel locomotive, railroad engineers have accepted without argument the first three requirements, knowing that the contract trials will demonstrate their truth or fallacy. With regard to the ultimate cost of the unit there is still grave question. The prices thus far quoted are excessive, considering the small capacities offered. It is only in the hope that prices will be very materially reduced when Diesel locomotives are built on a mass production basis that railroad engineers have been able to recommend the trial orders thus far awarded.



Comparison of Tractive Effort, New York Central Steam and Oil-Electric Locomotives

Like all other railroad problems this is one of economics. There is no question but there is a field for the Diesel locomotive adjacent to and bordering those fields now occupied by the steam locomotive and the electric locomotive, but its economic advantage over both must be firmly established before the railroads can invest very heavily in this new type.

Thus far the principal development of Diesel locomotives in this country has been for switching, in relatively small sizes. Such a locomotive was tested by the New York Central Railroad during the summer of 1924. These tests were very encouraging but clearly indicated that a locomotive of greater capacity was desirable.

Since that time the engineers of the New York Central have diligently endeavored to interest manufacturers in the production of an oil-electric locomotive weighing about 100 tons and capable of developing about 1,000 hp. As a result of their activity two orders have been placed for Diesel-electric road locomotives. The one for passenger service will contain an 800-hp. McIntosh-Seymour engine. The weight of this locomotive is about 148 tons. It is intended for light passenger service on the main line of the Putnam division. The freight road locomotive will weight about 128 tons, and the power will be furnished by a 750-hp. Ingersoll-Rand engine.

Tractive effort and speed characteristics of these locomotives, and of the steam locomotives which they are intended to supplant, have been plotted to the same scale and are shown on the curve reproduced elsewhere. Both the passenger and the freight locomotives will be equipped with four General Electric motors, each having a continuous rating of 266 hp. The locomotives will be arranged for multiple-unit operation, two or more being coupled together for hauling heavier trains.

The speed of the passenger locomotive hauling average trains on the Putnam division will be between 15 and 50 m.p.h., depending upon the weight of the train. The maximum safe running speed of this locomotive light will be 60 m.p.h. The freight locomotive is designed to haul the average weight trains on the Putnam division between 8 and 35 m.p.h., with a maximum safe speed of 45 m.p.h.

Effect of Diesel-Electric on Railroad Electrification*

BY HARTE COOKE
McIntosh-Seymour Corporation

PROBABLY the best way to get an idea of the effect of Diesel-electric locomotives on the electrification of steam railways is to look into the characteristics of the different types of motive power and take up the requirements of some of the special kinds of railway service, so that we may see what the special conditions are and what motive power would be best suited for the service.

The tractive effort curve has a maximum value which is limited by the weight on the driving wheels. This total weight on the driving wheels is limited by the axle loads permissible for any given track structure and also the number of driving wheels which can be used. A steam locomotive will maintain this maximum tractive effort practically constant up to about 10 m.p.h. Then the tractive effort falls off approximately inversely as the speed, approaching a hyperbola which is limited by the horsepower which can be developed by the cylinders and the boiler capacity of the locomotive. With this form of tractive effort curve the locomotive can pull at considerable speed any load which it can start. Full horsepower capacity is only developed at relatively high speeds.

As a matter of reference we will refer to the weight, first cost, fuel cost and time the engine is in service of the steam locomotive as 100.

The Diesel-electric locomotive has the important peculiarity of being able to develop its full horsepower at any speed, and this with the even torque of the electric motor gives very high tractive effort at starting. The weight of the locomotive is such that practically all of this can be utilized.

The tractive effort of a Diesel-electric locomotive varies in general inversely as the speed, the curve being approximately a hyperbola equivalent to the net horsepower that the locomotive is able to deliver. This gives the locomotive ability to start very easily any load it can draw at a reasonable speed and this large tractive effort at starting also gives high accelerations. In regard to weight, the Diesel-electric locomotive will weigh about 50 per cent more per horsepower than the steam locomotive; say we will represent this by 150. The cost per horsepower will be in the neighborhood of three to four times as much as the steam locomotive, which we will represent as 300 to 400.

In regard to maximum output, this type of locomotive can be arranged for multiple-unit control, so any amount of output desired can be provided.

With this type of locomotive the fuel and water necessary for a great many miles can be carried on the locomotive so that no tender is required. With the same relative leeway as used for the steam locomotive, and allowing for the absence of standby losses for the Diesel locomotive, we find that the fuel cost will be represented by 30.

Because of the freedom from operating delays and those caused by servicing and maintenance, the time in active service of a Diesel locomotive would be represented by 200, about twice what is usual with a steam locomotive.

On the same basis the electric locomotive would have a weight per horsepower equivalent to 75 as compared to steam, a cost of 300 to 600, depending upon the power station requirements; a fuel cost of 37 and a time in actual service equivalent to 225.

*Abstract of discussion before a joint meeting of A.S.C.E., A. S.M.E., A.I.E.E. and A. I. M. & M. E., New York City, Feb. 19, 1926.

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From a detailed analysis of the various fields in which the Diesel locomotive might be used we conclude that for very light traffic the freight and through passenger traffic can best be handled by the steam locomotive and the local passenger traffic by gas rail cars to keep the capital expenditure to a minimum, as the traffic is not heavy enough to allow the savings accruing from the more economical operation of Diesel-electric locomotives or full electrification to balance the increased capital cost.

As traffic increases, changed conditions should be carefully analyzed to see when the steam locomotive should be supplemented by Diesel-electric, the Diesel-electric making the best showing when it can operate the most miles per day.

The capital cost for full electrification is variable and becomes less as the traffic density increases. It is a rugged arrangement and can give much service at a low fuel cost if used in heavy traffic. Under these conditions the capital costs are reduced to an amount which the fuel saving justifies.

The Diesel-electric has an important difference from full electrification in that the investment can be made gradually and the benefits obtained at once and in proportion to the extent to which it is used.

All of the above shows that the three kinds of motive power are supplementary:

For light traffic, steam.

For heavier traffic, Diesel-electric.

For very dense traffic, full electrification.

Some Features of the Diesel-Electric Locomotive*

By N. W. Storer
General Engineer Westinghouse Electric & Manufacturing Company

RAILWAY people the world over show a tremendous and widespread interest in the Diesel-electric locomotive. This is simply indicative of the need for a locomotive which, while having all the advantages of steam as an independent motive power unit, avoids many of its disadvantages. The Diesel electric avoids much of the smoke, dirt and noise, the frequent trips to the roundhouse for attention to fires and boilers, and for fuel and water. It has four times the thermal efficiency of the steam locomotive and adds to that all the flexibility and easy control of the electric.

The steam locomotive is one of the greatest machines in the world but the interest aroused by the Diesel electric shows how anxious the railways are to get something better, how thoroughly everyone has come to believe that it is only a question of time when it will be superseded. Whether the Diesel engine is to displace it is another matter.

After the engine itself the great problem is the transmission of the energy developed to the driving wheels. Direct mechanical connection is more or less satisfactory for very small outputs, the hydraulic with a little larger capacity; and a combination of the two is being exploited in Europe. Practically everyone in this country who is working on a locomotive to be operated with the Diesel engine is using the electric system of transmission, indicating that there are serious limitations to the mechanical and hydraulic systems and that the great superiority of the electric is generally accepted. On the face of the matter, it would seem that a direct connection between the engine and the drivers would be the simplest and most efficient, but since the Diesel engine is not self-starting and does not operate satisfactorily at very low speeds, a direct connection is impracticable and any mechanical or hydraulic means, while possibly satisfactory and reasonably efficient when new, will continually develop troubles and will lose its efficiency with age. The electric transmission system, while admittedly being more or less expensive and heavy, is extremely simple to operate, absolutely flexible in its speed-torque characteristics and maintains the same efficiency throughout its life.

*Abstract of discussion before a joint meeting of A.S.C.E., A.S.M.E., A.I.E.E. and A.I.M.&M.E., New York City, Feb. 19, 1926.

Similarity of Diesel Electric to Motor-Generator Type

The Diesel-electric locomotive is very similar in its characteristics, performance and equipment to the motor-generator type of alternating-current locomotive which takes power from a single-phase trolley and utilizes a synchronous motor to drive a direct-current generator which furnishes current for the driving motors. The Diesel electric substitutes the engine with its auxiliaries for the synchronous motor, transformer and all other parts of the equipment pertaining to them. The equipment, from and including the direct-current generator to the motors, is or may be practically the same. Speed regulation is by voltage control of the generator in both cases. The motors for both are low-voltage, direct-current series machines, with all of their rugged characteristics. The main difference between the Diesel electric and the motor-generator type is that the output of the former is limited to a very definite value which may be carried for long periods, while the synchronous motor, which the same continuous rating, has a great power house back of it and may carry very heavy overloads for short periods. The Diesel electric in this respect has almost the same limitation as the steam locomotive. Its horsepower capacity is limited. It can exert the same maximum tractive effort as the all-electric because of the motor drive, but only at very low speeds.

On a Diesel-electric locomotive, the generator and motors must be considered as a unit in calculating the output of the locomotive. The most important features of the electrical equipment are:

1. The ability to utilize the full capacity of the engine at whatever train speed it is needed or desired.
2. A high efficiency so as to transmit the maximum amount of energy from the engine to the wheels.
3. Simplicity of control.
4. Light weight.

What are the characteristics of the electrical equipment that will best utilize the engine capacity? Voltage control of the generator has already been mentioned as giving the maximum flexibility for control of speed and tractive effort. This, however, is operative only up to the normal voltage of the generator and over most of the range while overloading the motors and generator. Over-voltages are sometimes secured by forcing the generator field. Where the voltage is limited, as is necessarily the case with a generator designed for a definite voltage, further speed control may be secured by weakening the fields of the motors, and there is no reason why a very considerable range of speed cannot be covered in this way. Difficulties from commutation of the motor at weak fields and high speed might be serious with motors taking current from a trolley with all its fluctuations and surges in voltage, but it is much less serious where the power plant goes with the motors. It must be remembered that neither generator nor motor is overloaded while operating with weak fields on the motors.

The efficiency of the electrical equipment is of the utmost importance, not simply on account of the fuel consumption, but because the higher the efficiency the greater will be the energy of the locomotive available at the wheels. Every effort should be made to make it as high as possible. The electrical equipment, when properly designed, will have an excellent all-day efficiency.

With all of the complications of the Diesel engine and its auxiliaries to contend with, it is all the more necessary to have a simple electrical control system. There are a number of ways to secure this feature. The one most commonly used provides an automatic control of the generator voltage which limits the output of the generator to the capacity of the engine so that the engine is in no danger of being stalled. This is usually combined with engine speed control. It is very desirable with the Diesel engine to keep the speed as low as possible for the output that is required, as low speed means lower maintenance, and especially lower consumption of lubricating oil, which is usually one of the most expensive items of operation. It is fortunate that this idea of variable engine speed combines very readily with a good control system for the electrical units of the power plant.

The auxiliaries on a Diesel-electric locomotive are like the auxiliaries on other kinds of locomotives—very important and very annoying. The Diesel engine requires pumps for water circulation and for lubrication. It requires air filters and radiators with a thorough ventilating system for cooling the engine. There must be ample

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capacity of air compressors for the brakes and control. These are preferably driven electrically, either from the main generator or from an auxiliary supply system. Means must be provided for starting the engine. This is a matter of the greatest importance, since if the engine cannot be started, it is useless. It is usually started by compressed air, a pressure of from 200 to 500 lb. being necessary. In some cases the engine is started by current from a storage battery using the generator as a motor. Of course, a comparatively small amount of control equipment for the electrical apparatus will be necessary, but the sum total of the auxiliary equipment amounts to quite a large proportion. Last, but not least, is a good supply of fuel, oil and water.

Weights of Diesel Locomotives Are High

Diesel locomotives that have been built thus far range in weight per horsepower from 207 lb., which was in practically the first locomotive built, to 400 lb. The largest one built in this country to date, the 1,000-hp. Diesel electric built by the Baldwin Locomotive Works, with electrical equipment manufactured by the Westinghouse Electric & Manufacturing Company, weighs 275 lb. per horsepower. It is probable that it will be some time before locomotives weighing less than 200 lb. per horsepower can be built regularly with Diesel electric equipments.

Therefore, when I give 200 lb. per horsepower as the low limit for the Diesel-electric locomotive, I give a figure which has never yet been attained and which will require all of the ingenuity and refinements available to secure. For the present, it is much safer to figure on a weight of 250 to 300 lb.

The Field of the Diesel-Electric

Is the Diesel-electric locomotive going to displace all of the steam locomotives and eliminate the electric from further consideration? It is quite unnecessary for anyone in the steam or electric locomotive business to be alarmed at this time. Samuel M. Vauclain has said that much time will elapse and many millions of dollars be expended to develop the Diesel-electric locomotive to a point where it will figure to any great extent in transportation service. While Mr. Vauclain is probably right so far as trunk-line service is concerned, it undoubtedly will have a definite field in transportation circles. The first and probably the most important field will be on branch lines of railroads in service such as the Canadian National Railways is handling with its Diesel-electric cars. Switching is a most desirable place for the Diesel electric. The ordinary steam switchers used around buildings are a great nuisance on account of the noise, smoke and dirt which they disseminate. They are also expensive to maintain. The Diesel-electric eliminates a great part of the nuisance, is able to stay on the job for many hours at a time and probably will require little maintenance when it is taken to the roundhouse. These features, together with the flexibility of the electric transmission and the fuel economy, make it a most desirable successor to the steam locomotive. It is preferable in some situations in large cities to the electric switcher, since it eliminates the necessity for the overhead wires or third rail which are extremely difficult to apply in and around buildings and represent a high investment from which little return is possible.

The Diesel-electric will probably find a certain field in main-line service, especially for low-speed freight haulage, where the weight per horsepower is no particular disadvantage. It will be particularly useful in this respect on branch lines where the traffic is comparatively light. Further than this, no one can speak with any degree of certainty at this time, but in general it is not probable that it will be used to any extent for other than low-speed traffic for some years to come.

There is one point concerning it which cannot be too often emphasized; its use does not eliminate the fundamental limitation of the steam locomotive, namely, that its power is limited to the amount that can be generated on the locomotive itself, while the electric always has all the power it can utilize.

Electrification

Electrification will go forward in terminals and on the railways having heavy traffic where the investment in overhead lines and substations does not represent a considerable part of the cost of electrification. The Diesel-electric and the straight electric locomotive will move side by side in improving the transportation of the railways of the world. The steam locomotive will still roll along for many years, as it has advantages which are hard to overcome. It must be understood, however, that the steam locomotive is not the simple machine it once was. The improvements which have so greatly increased its capacity and efficiency have made it a very complicated machine and one which is most difficult to maintain. These are the reasons which will ultimately compel the retirement of a large part of them in favor either of the all-electric, the Diesel-electric or some other independent type of locomotive.

COMING MEETINGS
OF
Electric Railway and Allied Associations

March 5 — Metropolitan Section, A.E.R.A., 29 West 39th Street, New York, N. Y.

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11 — Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

March 12 — Pennsylvania Street Railway Association, annual meeting, William Penn Hotel, Pittsburgh, Pa.

March 17-18—Central Electric Traffic Association, Portage Hotel, Akron, Ohio.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention, location not yet determined.

Track Saturation Problem in Detroit*

By Col. H. U. Wallace
General Manager Department of Street Railways, City of Detroit

DETROIT has much in common with other large cities in its transportation problems, but it also has many problems which are peculiar to itself and are perhaps unique in the urban traction field. The intensive industrial life of the city not only lengthens the peak periods but increases the customary two periods to three distinct periods, with some three or four semi-peak hours in the intervals.

The city extends along the north bank of the Detroit River for a distance of approximately 12 miles and is solidly built up from the river in a generally northwesterly direction to a depth of about 9 miles. It is nearly rectangular in shape. The business center is on the city's southerly edge, approximately in the center of its river frontage, extending about ¾ mile along the riverfront and about the same distance inland.

One line of railroads enters the city in the southwesterly corner and extends diagonally across it from the business center. A second line of railroads extends from the westerly limits of the city, running southeasterly in a diagonal line to the business center. In addition to these, a belt line extends around the city approximately 6 miles from the center. Naturally the manufacturing district follows very closely along these railroads, which brings this district in an approximate semi-circle 3 miles from the business section, while some of the larger plants lie in a circle from 5 to 6 miles from the center of the city.

Our traffic surveys indicate that the majority of our people live on the side of the city opposite to which they work; that is, people engaged in plants on the westerly side of the city live on the easterly side, and vice versa, thus making it necessary for them to travel across the city to get to their work.

Many of the industrial plants work either two or three eight-hour shifts

*Abstract of a paper presented at twelfth annual conference on highway engineering, Ann Arbor, Mich., Feb. 17.

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per day, employing thousands of men. There are probably very few railway systems in the world outside of Detroit that have a peak hour between 11 p.m. and 1 a.m. This peak is followed by the usual morning peak period from 6 to 9 to the business and industrial centers, and another in the afternoon from 3 to 6 o'clock. Since the starting time of these eight-hour shifts in our various industrial plants is not standardized, we find several periods which may well be termed semi-peaks. This lack of standardization, however, is helpful to the department, since if the hours were standardized we would require a tremendous increase in our rolling equipment to handle the armies of men who would pour into the streets.

While the transportation given by the department is fundamentally electric car service, a co-ordinated coach service is being developed rapidly. The growth and expansion of the city has made it imperative that we go into the coach business to serve newly populated areas on the outer edges of the city where the density of population is sufficient to warrant organized transportation but does not warrant the heavy investment incident to the construction of rail lines.

Coach lines run generally as extensions to the car lines in territory not directly served by the street car. Others are laid out as belt lines through newly developed territory intersecting existing car lines, thus giving a similar service through the transfer to that maintained where the car lines exist. This co-ordinated service works out to the benefit of the city, since the patrons originating their ride on a coach line can transfer, without additional cost, to a car line, and then, upon payment of 1 cent, can obtain a transfer to other existing car lines in the city.

The great expansion of the city demands some form of rapid transit. This may be rendered in two ways: First, of course, by a system of subways or elevated lines, or by a co-ordinated express and local street car and coach service. We are studying at the present time plans for such a co-ordinated service. These plans, which are still very much in the laboratory stage, would provide an express service by running street cars with stops approximately 1 mile apart. This service would be supplemented with a local coach service, or the reverse might be carried out with the coach in the capacity of an express.

One of the advantages of having the local service given by coaches is the ability of the coach to load and unload at the curb, thus avoiding a delay in the general flow of traffic, at the same time protecting passengers from the necessity of crossing through the traffic line to the center of the street to board the cars. The matter of protecting passengers either leaving or intending to board the cars is a serious problem because of the many unusually wide thoroughfares in Detroit. We have several streets of 100-ft. width and our main east and west artery, Jefferson Avenue, is 120 ft. wide. It will be seen from this that the distance from the curb to the car tracks is equal to the width of the average street.

Since, from necessity, the street car stops should be at intersecting street car lines, which means that usually these stops would be where the main traffic on the highway would also stop, there would be an advantage in having the street cars make only such stops, and if a substantial saving in time is made by these express cars, it is not inconceivable that local passengers would transfer from local coaches to the express street cars at these stops in order to get to the center of the city more rapidly.

Such a co-ordinated local coach and express car service would naturally be given only in the more densely populated areas. In other words, the coach routes would terminate approximately 4 miles from the center of the city, at which point the street cars would take up the local schedule to the end of the line. Studies of this co-ordinated service which have been made by this department indicate that on the longer lines reaching into the outlying sections a saving of ten minutes can be made in the run from the center of the city to the terminus of the line.

Since the city is paying for the railway system and its operating costs from the fares received and from no other source, one of the questions which must be answered is whether a line of coaches as outlined above would serve as a feeder to the car lines or act as a competitor, thus cutting down income and defeating the plan of purchase and operation. The studies made so far, however, indicate that the business is sufficient to warrant both classes of service, particularly since the service would be so attractive that competing privately owned jitney and bus companies will be forced out of business. It appears that this may be the solution for the present problem of tract saturation.

Oklahoma Utilities Speakers Announced

PROMINENT men in the different branches of the public utilities field have been selected to speak before the eighth annual convention of the Oklahoma Utilities Association to be held in the Mayo Hotel, Tulsa, Okla., March 9-11. Among those listed on the program are R. B. Campbell, president Midwest Electric Railway Association; Thomas F. Kennedy, member of executive committee H. L. Doherty & Company, New York City; J. E. Davidson, president National Electric Light Association; F. B. MacKinnon, president United States Independent Telephone Association; E. P. Dillon, general manager Research Corporation, New York City; Gen. Charles Keller, Byllesby Engineering & Management Corporation, Chicago; J. W. Gleed, general attorney Southwestern Bell Telephone Company, St. Louis; A. W. Leonard, president Natural Gas Association of America, Tulsa, Okla., and R. H. Sniffin, manager power department, Westinghouse company.

In addition to the general sessions, there will be division meetings for the electric railway, public relations, electric, gas and telephone sections. Ample opportunity for discussion will be afforded on the program.

Central Traffic Meeting

ON MARCH 17 and 18 the Central Electric Traffic Association will hold its next regular meeting at the Portage Hotel, Akron, Ohio.

The morning session on March 17 will be in the nature of a round-table discussion. The afternoon session will be given over to the transaction of committee work. It is the desire of the association, however, that so far as possible all committee work may be completed before the meeting in order to give more time to the transaction of business at the meeting. The session of March 18 will be devoted to reports of committees and such other business as may properly be presented.

American Association News

Mr. Trigg Proposed for Director of Chamber of Commerce

IN A LETTER addressed to member railway companies of the American Electric Railway Association, Executive Secretary J. W. Welsh calls attention to the coming election for directors of the United States Chamber of Commerce, which will be held at the annual meeting in Washington on May 11 to 13. He states that the industry's support has been asked for the election of Ernest T. Trigg, president and general manager of John Lucas Company, Philadelphia, Pa., who is a candidate for re-election from the second district. It is suggested that members communicate with their local Chambers of Commerce and also with any other organization members of the United States Chamber of Commerce in an endeavor to enlist their support in the above election.

Mr. Trigg has been connected with his firm since 1908. He has been general manager since 1912 and was elected president in 1922. He has been on many important boards and commissions of a public character, and was twice president of the Philadelphia Chamber of Commerce. Mr. Trigg is a director of the Philadelphia Rapid Transit Company and the Philadelphia Belt Line Railroad.

Metropolitan Section of the A.E.R.A. Meets March 5

FURNISHING transportation will be the subject of the next meeting of the Metropolitan Section of the American Electric Railway Association. W. B. Wheeler, assistant superintendent of transportation Third Avenue Railway, will present a paper on this subject. It will be discussed by M. J. O'Connor, superintendent of transportation New York Railways, S. S. Hamilton, assistant superintendent of transportation Brooklyn City Railroad, and D. K. O'Rourke, trainmaster Interborough Rapid Transit Company. Entertainment will be supplied by a well-known saxophone quartet from Connecticut.

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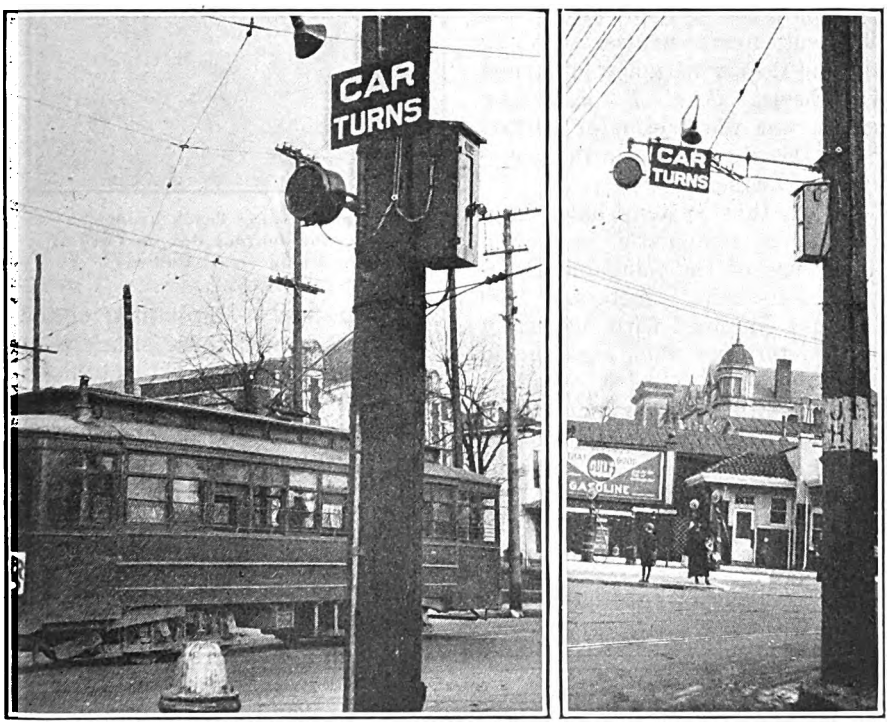
Maintenance of Equipment

Right-Turn Signals at Louisville

IN ORDER to avert collisions caused by automobilists while attempting to pass to the right of a car when that car is turning into a street to the right, the Louisville Railway, Louisville, Ky., has installed right-turn signals. Similar signals have been installed at other points where cars are likely to back on the main line and create a condition where vehicles should not approach too closely. The equipments were furnished by the Nachod and United States Signal Company and include a red projector, a floodlighted sign, a clearing contactor in the trolley wire and a relay in a box mounted on a pole.



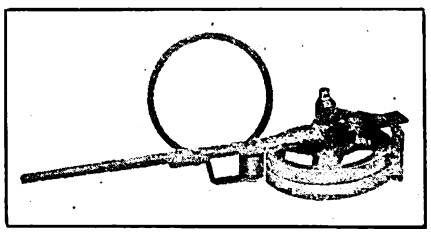
Signals in Connection with Floodlighted Signs Warn Motorists When Cars Are to Take a Turn. At Left, Pole Mounting for Sign. At Right, Pipe Bracket Mounting

When used in connection with a Cheatham switch, the same operation of the car under the Cheatham contactor that throws the switch-point for the diverging route shunts out a relay in a normally closed circuit. This causes its armature to drop to a back contact, closing a circuit to illuminate the red projector and to floodlight a sign reading "Car Turns." The projector is equipped with a 50-watt lamp in a 9-in. parabolic glass reflector with red cover glass and makes a brilliant effect even in daylight. The floodlight reflector has a 50-watt lamp also in series with the projector. This display of signals not only gives an arrestive warning, but explains the reason for it.

After the car has made the turn, it passes under a normally open contactor of the short type, which picks up the "stick" relay again, and thus removes the indication. The railway has installed six of these in various parts of the city. One is used to give warning that a car is about to back over a piece of double track while wye-ing; in this case the sign reads "Car Backs." It is controlled by two independent contactors. Another is placed where the car line swings across the street to make a terminal loop. One illustration shows the outfit mounted on 1½-in. pipe bracket, extending from the pole with sign and projector at the outer end of the bracket. The other shows a sign and projector mounted against the pole.

Fixture for Edgewise Bending of Rings

FINISHING rings for flush type headlights are made of ¾-in. flat stock ⅛ in. thick in the shops of the Eighth Avenue Railroad, New York, N. Y. The rings are formed by bending the stock edgewise in a special fixture, which is shown in the accompanying illustration. The fixture has a central portion, around which the bending takes place. A slot in this central ring keeps the stock in place and prevents it from turning up. A clamp to hold the end of the stock is pivoted from the central part of the ring, and the forming arm has rollers, with a groove to hold the edge of the flat strip. These roll the ring into position. This forming arm is also pivoted from the central part of the ring.



Fixture Used to Form Headlight Finishing Rings from Flat Stock. A Finished Ring Is Shown in the Background

To form a ring, the stock is heated so that it will bend readily, and the end is then placed in position and held firmly by the clamp of the fixture. By rotating the arm, the rollers force the flat stock into the groove of the central ring of the fixture and so bend it into circular shape. After the rings are formed, the ends are scarfed and welded by a blow from a hammer.

Changeable Sign for Front and Rear Entrance

DURING rush hours cars of the United Electric Railways, Providence, R. I., are operated with two men, but at other times many one-man cars are in operation. Passengers may board cars at the rear end with two-man operation, but must, of course, enter at the front of

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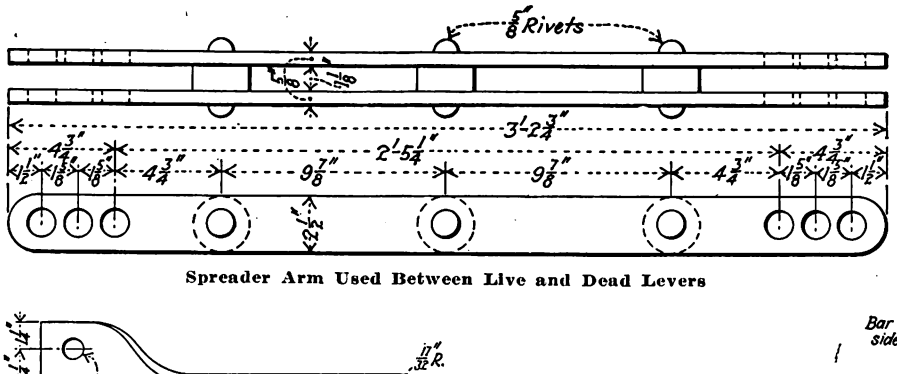
one-man cars. It was thought desirable, therefore, to install a sign to tell passengers at which end to board the car. Immediately below the destination sign in the front vestibule window a translucent sign has been installed. One end reads "Enter Front" and the other side reads "Enter Rear." A movable metal slide can be so placed that either end of the sign is concealed. Thus it can be made to read simply "Enter Front" for one-man operation or "Enter Front or Enter Rear" for pay-leave, two-man operation or "Enter Rear" for pay-enter, two-man operation. The sign itself consists of a piece of cloth spread on a metal frame attached to the window posts. The light of the car body is sufficient to make the sign readable from the street at night.

Maintenance Practices of Union Street Railway, New Bedford

Dead Lever Guide Aids Brake Adjustment

IN ORDER to insure proper braking at all times, the Union Street Railway, New Bedford, Mass., uses a somewhat novel brake-adjusting device. A piece of ½-in. steel 36 in. long and 3 in. wide is bent U-shaped and bolted to the truck bolster. Through this U-shaped piece of steel two or three rows of ⅝-in. holes are drilled. There are usually eight or ten holes in a row and they are so aligned that they provide a 7/16-in. distance between holes, thus permitting a 7/16-in. take-up of the brakes. The dead lever arm is passed through the center of this U-shaped dead lever guide and is held in position by means of a steel pin that is passed through a pair of these drilled holes. Adjustment for brake shoe and wheel wear can readily be made. The spreader arm which extends between the live and dead lever arms is provided with three bolt holes to take care of the adjustment made necessary when equipping the car with new or turned down wheels. G. H. Bonner, shop foreman, was the originator of this device. Details are shown in accompanying drawings.

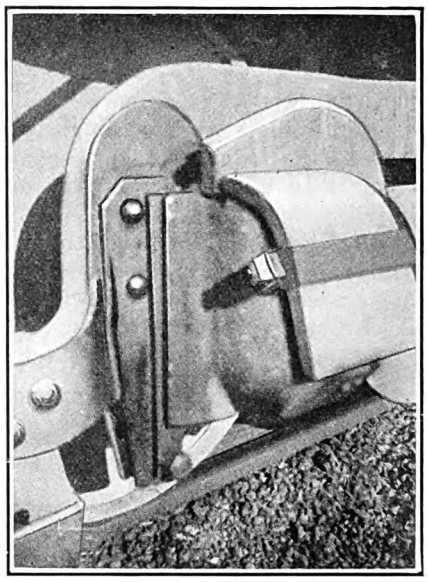
Cars of this system have been placed on a systematic inspection basis by use of the Sangamo Economy power-saving meters. The meters are equipped with inspection dials to determine when cars should be inspected or overhauled. When a car has operated approximately 750 miles it is given a brake inspection. This has been found frequent enough to keep a car which is provided with this brake-adjusting device in proper braking condition at all times.



Spreader Arm Used Between Live and Dead Levers

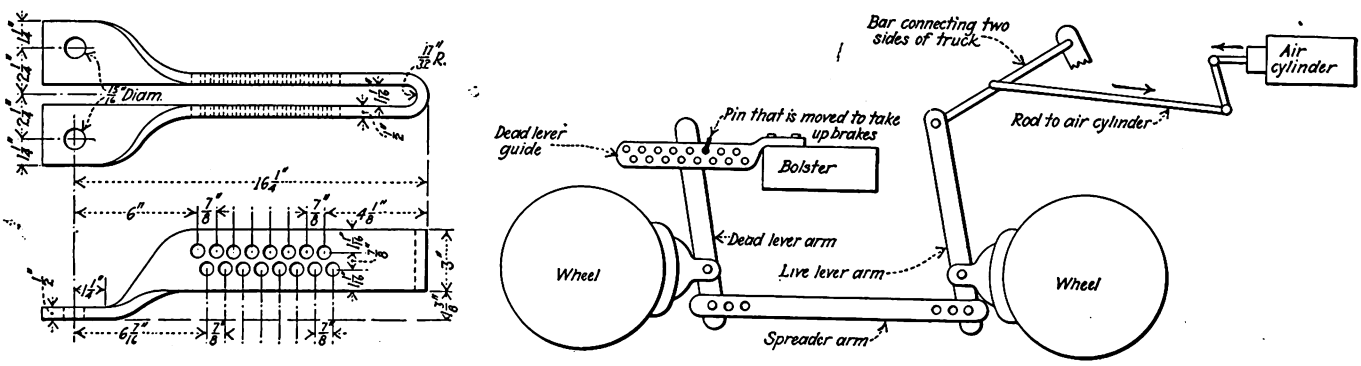
Journal Box Shims Save Wear

AS A means of holding the journal box housings in their proper place the Union Street Railway, New Bedford, Mass., makes a practice of placing steel shims between the journal box housing and the truck frame.



Shims Bolted to the Truck Frame Save Wear on the Journal Box on Cars of the Union Street Railway

A through bolt at the bottom of the truck frame holds these shims in a vertical position, while side motion is prevented by the presence of the journal box housing on one side and the bolt heads of the truck frame on the other side. As these shims are of softer metal than the journal box housings they absorb whatever wear there is and thus leave the truck frames and journal box housings in their original condition. Ordinarily shims ¼ in. thick are used, but in exceptional instances a ⅜-in. shim is installed. The surfaces of these shims are kept lubricated by applying old crank case automobile oil. Use of these shims has almost eliminated the breaking of truck and journal box parts and has resulted in holding the frame, journal, axle bear-



At Left—Detail of Dead Lever Guide. At Right—Brake-Adjusting Device Used on Cars of the Union Street Railway, New Bedford

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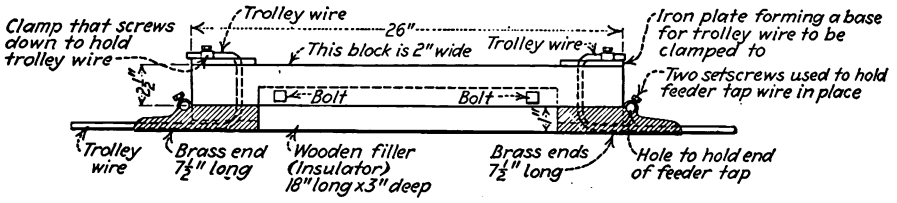
ing and wheel in proper alignment. This has necessarily aided in eliminating worn journal box bearings, worn axle heads and grooved truck and journal box housings.

Long Section Insulator Used by Union Street Railway

A 26-IN. wood section insulator designed by Peter Dupuis, line foreman, is used by the Union Street Railway, New Bedford, Mass. It has an oak filler 18 in. long, which makes a positive breaking of the current. This filler is driven into a slot in the breaker and is held firmly in position by two through bolts. The brass approaches are



Section Insulator Designed to Prevent Damage to Ends of Trolley Wire

7½ in. long and are ordinary except for the special device for holding the ends of the feeder wires. These are not soldered, but are held in a socket provided with two setscrews. This method insures proper contact and at the same time the feeder wires can be easily removed. The ends of the trolley wire are passed through a gradual curve on the ends of the breaker and firmly held on the top of the breaker by means of an iron plate equipped with an iron clamp provided with two bolts. This method avoids damaging the ends of the trolley wire. Another advantage of this type of breaker is that the ends of the trolley wire are of sufficient length so that they are held in such a position that a maximum of strength is obtained.

Special Work Made by Thermit Welding

SEVERAL simple pieces of special work have been made in the Rochester shops of the New York State Railways by using their new thermit welding outfit. In this work, measurements of the old frogs which are to be replaced are taken in the ground by the railway engineering department. A sketch is made up from these measurements, and the work is done in the blacksmith shop under the direction of Louis Kubiak. The accompanying illustration shows two frogs being constructed. These are made in one piece to avoid joints. The guard rail is cut to the proper length and is then bent to the radius desired. The rails are fitted together and a slight space is left between the rails of the central points where the welding is done. After the work is set up, measurements are checked against the drawings before the pieces are finally bolted down to timbers for the welding operation.

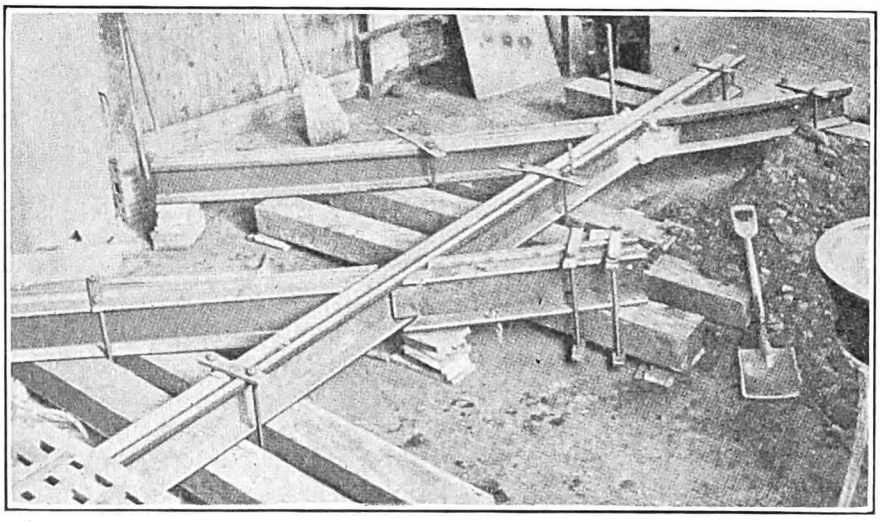
A mold constructed in standard manner is placed around the point where the thermit metal is to be deposited, and a crucible is set over the junction of the rails. The thermit welding is done in the usual manner. The illustration shows the metal as freshly deposited at one of the frog points of the double frog being made. The sand about the mold has been removed. After the metal is cooled properly, it is ground to a smooth surface at the top and the proper groove is ground to permit the passage of wheel flanges.

The cost of constructing special work as indicated is much less than what would be required to buy the pieces from manufacturers, but of course these frogs will not last as long, as they contain no solid manganese points to take the excessive wear at the centers.

Discarded Headlights for Indirect Park Lighting

SOME 18 miles north of Toronto, along the main highway and the route of the Toronto & York division of the Hydro-Electric Railways, lies a fine pleasure resort comprising a lake of more than 50 acres and another 165 acres of adjacent beach and woodland. When this park was in the hands of the original Toronto & York Radial Railway it was operated directly by the railway at a substantial loss. Under the Hydro-Electric Commission, however, the grounds have been turned over to a professional amusement concern, with the result that the railways are in a fair way to be relieved not only of the former operating expense, but of interest on the investment as well. This desirable end will be aided by a housing development scheme whereby cottage builders will be able to secure lots at a distance of only 300 ft. from the lake, their homes being made accessible by a 30-ft. roadway to be built at the rear of the cottages and going round the lake.

One of the features that has helped to popularize the park is a novel and economical scheme of indirect illumination. At the lake end nearest the highway is a power house and plenty of shrubbery. Concealed in this shrubbery is a battery of discarded arc headlights. These headlights produce illumination similar to that of a monster searchlight of an excursion steamer and of course attract the favorable attention of the thousands of travelers on the main highway near by. As the power used is entirely off-peak, the principal cost is for replenishing carbons.



Two Special Work Frogs Set Up for Welding in the Rochester Shops of the New York State Railways

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The News of the Industry

Wage Change in San Francisco

The Market Street Railway employees of San Francisco, Cal., have received a voluntary wage increase of 2 cents an hour, effective Feb. 28, while the San Francisco supervisors have just denied more pay to the employees of the Municipal Railway. Under the new scale Market Street Railway employees will receive 56 cents an hour. Commensurate increases were given in all other departments, including shops, substations and track repair men. Samuel Kahn, executive vice-president of the road, said that the raise was entirely voluntary on the part of the management and would cost the company about $200,000 annually. About 2,500 men are affected. This action followed shortly after similar action by the California Street Cable Company. It is in line with the policy of restoring wages to the pre-war maximum.

The decision of the supervisors denying Municipal Railway employees an increase in wages from the present scale of 67½ cents to 75 cents an hour was attended by a series of bitter attacks by representatives of the men. The combined finance and public utilities committees of the San Francisco Board of Supervisors said, in effect, that it wanted to give the raise but it could not find the money for the purpose. The spokesmen for the employees said the money should be found even if a 6-cent fare were necessary.

It was agreed by the committees that there was at hand a sum amounting to $343,000 which might be used to pay the wage increase demanded, but they also pointed out that this would last for only two years and that afterward there would be an annual deficit. Expert accountants retained by the employees declared that the figures quoted by the supervisors were obtained through erroneous bookkeeping methods and that there was money enough to meet the increase. They urged rectification of the accounting system. In the end it was agreed that there must be some changes in the financing before any pay increase could be recommended.

Committee to Study Atlanta's Needs

Mayor Sims of Atlanta, Ga., following a councilmanic resolution, has named a new committee to consider the "relief petition" of the Georgia Railway & Power Company. The petition of the company was filed early in December and suggested seven different remedies of relief. One of these, the elimination of jitney buses from the streets, has already been granted, and another, that of eliminating certain unnecessary street car stops, has been recommended by the Council and is now before the Public Service Commission for action. The other suggested remedies are: Elimination, to the extent necessary, of the gross receipts tax and street paving assessments; 10 cents for cash fares, with a special rate for riders who use tickets, and a 2-cent charge for transfers.

Railway and Bus Company Unite in Bid

New York City Companies Would Abandon 25 Miles of Track and Run 50 Miles of Bus Routes at Five-Cent and Ten-Cent Fares with Transfers on Latter

AN EXCLUSIVE franchise to operate an extensive bus system in Manhattan on which 5 cents would be charged on crosstown lines and 10 cents on longitudinal lines was sought in a joint petition presented on Feb. 24 to the Secretary of the Board of Estimate of New York City by the Fifth Avenue Bus Company and the New York Railways. The two companies announced an amalgamation for the purpose of bus operation and offered in return for the franchise to eliminate 25 miles of street car tracks, remove 200 cars and to give up perpetual franchises owned by the railways.

A summary of the main points of the new petition, follows:

(a) Marks first move toward the installation of a comprehensive motor coach service through co-operation of effort and co-ordination of facilities of existing surface car companies.

(b) Discontinuance of the use of 25 miles of street car tracks.

(c) Surrender of perpetual franchises to operate street cars on those tracks.

(d) Removal of over 200 street cars from the congested city streets.

(e) Operation of ten crosstown motor coach lines—23.96 miles of route—for a 5-cent fare.

(f) Operation of three longitudinal motor coach lines—24.58 miles of route—at a 10-cent fare.

(g) A universal transfer system, under which by means of transfer and retransfer for a single fare of 10 cents a person may ride from any point on the system to any other point thereon.

(h) A modern motor coach system covering about 50 miles of routes in Manhattan.

(i) Service to be started at once on certain lines and full service to be in operation in 90 days on the remainder of the system.

(j) Provision made for recapture by the city after five years for the purpose of municipal ownership and operation.

(k) Efficiency of service guaranteed by a staff of men experienced in omnibus operation and familiar with local transportation conditions in Manhattan.

Through John A. Ritchie of the Fifth Avenue Coach Company as spokesman, it was disclosed that controlling interests of that corporation and of the New York Railways had effected the amalgamation through the formation of a company just incorporated as the New York City Omnibus Corporation, of which Mr. Ritchie is president and J. M. McCarthy secretary.

The consolidated company withdrew the previous applications made by the Fifth Avenue Coach Company and the New York Railways and submitted its new joint plan, which calls for a virtual monopoly of bus operation in Manhatton with extensions into the Bronx.

The corporation also makes provision for recapture in the interest of municipal operation by the city after five years of private operation, if the city should so elect.

A statement by the sponsors for the new application concerning their proposal follows:

Under this plan presented by the New York City Omnibus Corporation, headed by John A. Ritchie, the new system can be put into immediate operation, first, because the new corporation has available the unique facilities of the Fifth Avenue Coach Company, including buses, equipment, personnel and organization, to put such a system into immediate operation, and, second, because all danger of litigation between the interests involved would be at once eliminated, and the city would, moreover, without expenditure, regain control of many of the streets, its use of which is now restricted by existing perpetual franchise grants.

Traffic all through the Borough of Manhattan would be vastly speeded up; congestion due to unnecessary duplication of routes would be eliminated, and the transit facilities of the borough would be placed in a more plastic state, whereby the city would mold them more nearly to meet the needs of the changing conditions.

The new company proposes that as soon as practical other street car lines of the New York Railways shall be motorized and the street-car tracks taken out. The ultimate object of the new company is to extend this plan to all street-car operation in Manhattan when and as soon as possible and practicable.

Sixth, Seventh and Columbus Avenue, three of the traffic arteries, would be immediately freed of street-car tracks under the plan, and Eighth Street and 116th Street for the most part would be immediately similarly cleared of inflexible street railway lines.

The crosstown routes, ten in number, would be operated at a 5-cent fare. The longitudinal lines would be operated at a 10-cent fare. Free transfers would be issued from the 10-cent lines to the 5-cent lines and to the other 10-cent lines, and a 5-cent transfer would be sold on the 5-cent lines for use on the 10-cent lines. The transfer privilege would allow a person by use of a transfer and retransfer to ride from any point on the system to any other point on the system for a single fare of

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10 cents. This is the most comprehensive transfer arrangement which has been submitted with the proposals for bus operation in the Borough of Manhattan.

The proposal provides for the recapture by the city for municipal operation after five years at a valuation to be agreed upon by arbitration.

The routes proposed not only include substantially all of those laid out by the City Board of Transportation, but also additional routes provided for by the surrender of part of the perpetual franchise routes of the New York Railways—that is, Sixth, Seventh and Columbus Avenues and other thoroughfares. Service on some of these routes can be started immediately and the entire system can be completed and placed in operation within ninety days.

Approximately 200 surface cars would be eliminated by the plan and the passenger-carrying capacity of the borough's surface lines would be increased vastly by the installation of 210 double-deck and 202 single-deck motor coaches on the superseded electric lines and the additional new lines contemplated, which buses would be of the finest and most modern type and practically noiseless.

Consideration was given in the plan of the system to the elimination of inconveniences of unnecessary transferring by making provisions for the through routing of vehicles between extreme points in the borough at a maximum cost of 10 cents to the passenger.

The most of the afternoon of Feb. 24 was devoted to conferences with representatives of three of the principal competing bidders for bus franchises in Manhattan and to a general study of the terms and conditions offered in their respective petitions. The three applicants were the Service Bus Corporation, the Fifth Avenue Coach Company and the People's Electrobus Corporation.

It is said that the Fifth Avenue Coach Company also plans to combine a new bid with that of the Third Avenue Railroad subsidiary in the Bronx and may file a joint supplemental petition for the Bronx. The Third Avenue bus subsidiary is known as the Surface Transportation Company. The Third Avenue Railway now enjoys the greater part of all the road surface transportation in the Bronx.

Mayor Walker said on Feb. 25 that no action on the application of the New York City Omnibus Corporation could be taken until after consideration of the other applications for bus franchises and after the statutory hearings on the petitions yet unheard. The Board of Estimate fixed March 11 to hear the omnibus corporation.

Jersey Paving Bill Laid Over

After a fight in the Legislature, Senator Frank D. Abell of Morristown was compelled on Feb. 23 to lay over his bill to relieve street railway companies from paving obligations. On three roll calls he was able to get only ten of the eleven votes necessary for the passage. Although several Senators joined in the debate against the measure, Simpson of Hudson County and Roberts of Burlington County were the only ones to vote in the negative, the others remaining silent as their names were called.

Senator Abell said that the obligations originally assumed by the traction companies had become obsolete, and he charged that it was unfair to continue to compel them to help keep up the roads used by competing jitneys and motor buses. He declared that the Morris County Traction Company was in bankruptcy and that unless relief were granted trolley service would be lost to the working people. He argued that eight states have relieved trolley companies of such obligations.

Senator Simpson led the attack on the bill. He said that the utility companies, in order to obtain their valuable franchises, had agreed to certain things that they were now finding expensive and that if they were allowed to escape the burden it would have to be borne by the municipalities. He said in the next six years it would cost Jersey City $2,500,000 and Hoboken would have to pay several hundred thousand dollars on paving that had been neglected by the Public Service Railway.

New Deal Suggested for Worcester

Special Committee Named by Mayor to Investigate City's Street Railway Needs Favors Transportation Monopoly as Best Policy, with One Company Operating Trolleys and Buses

THE entire passenger traffic of the city of Worcester, Mass., should be handled by the Worcester Consolidated Street Railway, whether by trolley cars or buses used in conjunction with the trolley cars. Changes should be made in the regulation of the routing of buses so used, so that every emergency of traffic might be met with the least inconvenience. These are the principal recommendations submitted to Mayor O'Hara by the special commission appointed to investigate.

Among the most vital needs are given the speeding up of the trolley service in the city, provide new and up-to-date cars equipped with proper safety devices, that will permit the company to meet the new conditions that have come with the fast-moving automobile competition. At present the average speed of trolleys is a trifle more than 8 m.p.h.

An interesting feature of the report is the finding, based upon an actual count of passengers carried at the busy hours in Worcester, that buses cannot take the place of trolleys, but only aid in the carrying of traffic because the streets could not accommodate sufficient buses to handle the problem.

The report was drafted by Prof. Albert S. Richey of Worcester Polytechnic Institute and was adopted by the full committee, which included Frank H. Willard, City Solicitor William C. Mellish, William J. Flickinger for the New Haven Railroad, Clark V. Wood, president of the Worcester Consolidated Street Railway.

The report came as a result of the study made by the special commission of Worcester trolley needs, prompted by the appeal of the officials of the New York, New Haven & Hartford Railroad for co-operation from the city of Worcester in the effort of the railroad company to have legislation enacted at the State House that would permit the railroad to take back control of the trolley lines of the state, and on which the railroad officials in return promised to expend large sums of money in rehabilitation. Worcester was slated to have $1,000,000 of the proposed amount to be so expended in improving the service, and more if needed.

Professor Richey says the competition of the privately owned automobile has very seriously reduced the patronage of the railway in Worcester, as it has in every other comparable city of the country. It is believed, however, that with the proper rehabilitation of the railway, including the substitution of a considerable number of comfortable, convenient, attractive, and thoroughly modern cars, and especially if some improvement can be made in operating speed, a great deal of this lost patronage can be regained.

Among other things the report as presented says:

One of the most vital factors entering into proper street railway transportation is speed, and there should be a proper co-operation by the city officials toward its attainment. There is no question but that the larger part of the traveling public is served by the street cars, or that the street car is by far the most economical user of street space. Both of these facts are demonstrated by counts made within the past two weeks and referred to later, herein. Any steps taken to expedite the movement of street cars are for the general good of the entire city.

The company owns about 168 closed cars, most of which are less than 20 years old, and which are suitable for present service, with the exception of 25 cars which have been remodeled from open cars, have high platform, two steps and narrow doors, and which for those reasons unduly slow up service and consequently should be retired. This leaves about 145 closed cars which I agree with Mr. Wood are suitable for present operation, and deducting this number from the requirement of 220, Mr. Wood arrives at his number of 77 new cars to be purchased. He speaks of the proposed new cars as "lightweight one-man two-man cars," which agrees with the Day & Zimmermann statement as to a suitable type of car for this property, and with which I also agree, except that in the light of recent experience elsewhere, I believe practically the entire operation can be with one man, especially if the cars are designed to facilitate the movement of passengers and the collection of fares, including such devices as the treadle-operated rear exit door.

Equipment Should Be Overhauled

The purchase of new cars should be accompanied by a complete overhauling and repainting of all of the existing equipment which is retained in the service, and the future policy should and of course will include that of good housekeeping to the extent that cars are kept well painted, clean, safe and comfortable in operation, and manned by operators who at all times consider themselves as enthusiastic salesmen of a proper transportation service as much as the servants of the public as though in its direct employ.

The additional bus service suggested by Mr. Wood in substitution for railway service on the Worcester & Webster and Webster & Dudley lines and the Blackstone Valley division, south of Millbury, are matters which are most important to the city of Worcester. Such lines as these can be served best by bus, and in my opinion such substitution should be made.

Within the city of Worcester, it is doubtful if there is any section which at present is not served properly either by street cars or buses, but the street railway should be ready to provide one service or the other as soon as the need for it is demonstrated, and it is shown that a reasonable patronage is ready for the service.

With traffic which requires as does Park Avenue operation the use of street cars as frequently as 22 in a period of 1½ hours, there can be no question but that such operation is much more economical than would be that of buses, even if there were street room for the latter.

Relative to the reconstruction of various tracks in the city comprising about 34,000 feet of track in twelve locations, there is no question but that a proper rehabilitation of the railway would include such reconstruction. The railway should co-operate with the city in connection with all track reconstruction, to the end that where such reconstruction is necessary and the street is to be rebuilt, the work be done simultaneously, and at such time as

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the city is ready to proceed with its work. In connection with track reconstruction and betterment, automatic electric switches should be installed at all points where track switches require movement in the operation of one-man cars.

In order to determine the relative use of the street by automobile and street car, I arranged for counts to be taken on South Main Street at Wellington Street, on Jan. 26, 1926. All outbound traffic was listed during the period between 4 and 6:30 p.m., and during that period the following outbound traffic was noted:

Six hundred and ninety-four private automobiles, with 1,144 passengers.

One hundred and thirty automobile trucks, with 196 passengers.

Twenty-two taxicabs, with 41 passengers.

Eight hundred and forty-six total automobiles, with 1,381 passengers.

Seventy-one street cars, with 3,127 passengers.

Professor Richey says it is probable that this count represents a fair cross-section of all cars and riding persons leaving the downtown section in all directions. He directs attention to the fact that although less than 8 per cent of the vehicles were street cars, they handled 70 per cent of the persons; also that the average number of passengers per automobile was 1.63, while the average number of passengers per street car was 44. He says that when it is considered that the street car occupies no more street space than two automobiles, the remarkable efficiency of street cars as a transportation agency as compared with the automobile is manifest, together with the fact that it is handling many more than double the number of passengers traveling by all other agencies. True, the above observations were taken wholly within the rush hour, but Prof. Richey says it must be remembered that this is the time during which the traffic problem is most serious.

School Regulations in Chicago Expedite Railway Travel

A step in curbing the exuberant youth in car loading at the high schools of Chicago, Ill., has been taken as a result of the ingenuity of the leaders of one school who devised and caused the adoption of regulations to get the students on their way home in orderly fashion. The regulations have been published as a model and are the product of Tilden Technical High School students. The school is one of a number at which several thousand students clamor for street car service, mostly at the same time. The regulations follow:

On each corner will be about four cadets with one senior cadet in charge. As soon as a car is available, one cadet will call the destination of the car, as, for instance, "Halsted and 79th." When the car is loaded a director will give signal for car to start. If there is a car superintendent present, he will give signal for the car to start.

Follow These Instructions

1. Line up in a single file parallel to the street car.
2. Do not get on the car while it is in motion.
3. Do not stand on the rear platform of the car unless it is impossible to enter the car.

Purpose of Regulations

Develop a well-regulated system of boarding street car and passing between periods which will:

1. Safeguard the lives of the students.
2. Save time.
3. Prevent congestion.
4. Give Tilden a good name.

Slogans

"Have fare ready"

"Line up" "Speed up"

"Move Along"

Goal

"To make the best better"

Willing to Surrender Massillon City Franchise

Heavy losses sustained in the operation of its city lines in Massillon have led the Northern Ohio Traction & Light Company to ask the Council of that city for permission to discontinue its city service. Such application has no bearing on the interurban service between Massillon and Uhrichsville on the south or Canton, Akron, Cleveland on the north.

The company does not desire to be placed in the attitude of attempting to evade its contract, and for that reason has hesitated to suggest an abandonment of the system to the City Council and citizens of Massillon. It develops, however, that a bus company has been organized with capital sufficient completely to motorize the city. In view of this, the company has expressed a desire to abandon its so-called city lines, leaving the interurban line through the city.

The company has felt for some time that the people of Massillon wanted a bus transportation system for the city, but it does not now desire to extend its bus operations to that extent, nor has it in the past desired to do so. The company which has proposed to put in a bus system is experienced in bus operation.

On its part, the Northern Ohio Traction & Light Company has offered to aid the city and applicant company to establish a permanent bus system. The company believes that in cities the size of Massillon a bus system can be operated which will be of greater benefit than the present rail system, and meet more adequately the needs of the public than does the railway. The company's present contract has only a few years to run. The lines have been operated year by year at considerable loss.

The proposal of the bus company, headed by Frank Booth, fixes a rate of fare at 8 cents cash, two tickets for 15 cents. It is intended to operate upon the principal streets of Massillon, and particularly to serve the steel mill district.

The application of the bus company and the one for abandonment will come before the Council on March 1.

$11,000,000 Milwaukee Budget

Approximately $11,000,000 will be spent by the Milwaukee Electric Railway & Light Company, Milwaukee. Wis., and its associated companies under the 1926 budget adopted at the annual meeting on Feb. 17. The program provides for these disbursements:

Milwaukee Electric Railway & Light Company, $6,100,000; Wisconsin Electric Power Company, which owns the Lakeside power plant, $2,300,000; Wisconsin Gas & Electric Company operating in Racine, Kenosha, Waukesha and other communities in southeastern Wisconsin, $1,600,000; Wisconsin Traction Light Heat & Power Company, operating in Appleton, $800,000; Badger Public Service Company, operating in Elkhart Lake and other Sheboygan County communities; Peninsular Power Company, operating in the northern peninsula of Michigan, and the Milwaukee Northern Railway, $200,000 among them.

The greatest single expenditure will be $2,300,000 for equipment to increase the output of the Lakeside pulverized fuel plant. Approximately $2,000,000 will be expended on the electric railways, exceeding by $600,000 the expenditure during 1925. About $1,000,000 will be required to complete the Waukesha interurban cut-off. Reconstruction of track in Milwaukee will require approximately $885,000.

New Problem in Jacksonville

In view of an adverse opinion from Austin Miller, city attorney, of Jacksonville, Fla., no referendum on the proposal that the city acquire by purchase and operate the Jacksonville Traction Company will be called by the City Commission, according to Frank H. Owen, chairman. The popular vote, which was requested by the City Council, was scheduled for April.

According to the opinion by Mr. Miller, it would be illegal for the city to spend public funds to determine "whether or not the city should do something it is not authorized to do by its charter." If any individual or group wants to press for a referendum, according to the opinion, it will be necessary to go to the Legislature for an act empowering the city to engage in street railway ownership.

So the Public of Baltimore May Know

The United Railways & Electric Company, Baltimore, Md., is conducting an advertising campaign through the Baltimore newspapers which gives the public intimate details of the street car system and how it is operated. Several of these advertisements have appeared.

The United takes the view that this advertising, if steadily and consistently presented, will greatly benefit the city, the patrons and the company.

The following benefits are listed:

A better understanding of the street car company's problems.

More street car riders and increased revenue for the company.

Better street car service.

A quickening of the city's progress, which is bound to be dependent upon the quality of its transportation facilities.

The company says:

Big improvements in street car service are expensive—more expensive now than ever. And yet rapid transit must grow and improve if the city is to grow and improve. In order to increase its capacity for improvement the company must increase its revenues. The sole source of a railway's revenue is its riders. Its income consists entirely of individual car fares. It cannot have more income until more Baltimore people ride the street cars. With increased riding and increased income there must come major improvements in service.

For years and years street car companies have been almost inarticulate. Other institutions, public and private, with problems to be solved and work to do have taken the public into their confidence and have asked their help and understanding. Street car men have worked in silence. Being in closer contact with the exacting and critical public than any other public utility they have leaned in the direction of taciturnity under fire. Work hard, take your medicine, keep quiet. That was the creed of the old time street car man.

It was a praiseworthy and creditable creed and it still is. But today "keep quiet" is a principle easily carried to extremes. The United intends to continue to live up to it. But it will amend the principle to this extent—it will not require the Baltimore public any longer to guess at the truth about its affairs or to accept misstatements in place of the truth.

These are the reasons for the United's advertising.

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Franchise Memorandum on File at Louisville

A tentative memorandum regarding abolition of the present franchise and fare ordinance, under which the Louisville Railway, Louisville, Ky., now operates, and replacement of it with a new one, with a higher cash fare and slightly lower than present ticket fare, has been placed in the hands of Mayor A. A. Will. It is expected the memorandum will be made the basis on which something tangible may be worked out.

Experience seems to have proved that the present modified service-at-cost ordinance under which the company operates could well be modified in its provisions to the benefit of the city and the company.

News Notes

Metal Tokens in Use.—The Beech Grove Traction Corporation, connecting Indianapolis, Ind., and Beech Grove, has discontinued the sale of its five two-zone tickets for 50 cents and is now using metal tokens and Johnson fare boxes. The majority of patrons, it is said, prefer the metal tokens.

Seeks Increase in Fares.—The Union Traction Company, Coffeyville, Kan., has petitioned the Public Service Commission for an increase in its fares in the cities of Parsons, Cherryville, Independence and Coffeyville. The company requests a boost in local fares to 8 cents or two tickets for 15 cents, with a book fare of 25 rides for $1.65. The present rate is 6 cents with a 5-cent book fare. The case was set for hearing at Topeka March 1.

Books Extended to Fourteen Days.—The Public Service Commission has approved an amended local passenger tariff of the Geneva, Seneca Falls & Auburn Railroad, Inc., Seneca Falls, N. Y., changing the limit on 20 trip commutation ticket books from ten to fourteen consecutive working days. This amendment was effective Feb. 15 under special permission of the commission.

Metal Tokens Again in Louisville.—The Louisville Railway, Louisville, Ky., which has been issuing paper tokens since Feb. 1, has gone back to the metal tokens, following complaints of patrons. The tokens are the same as those previously used by the company. There is no saving for the consumers in buying tokens. They are sold at the rate of seven for 35 cents.

Higher Fares Discussed at Hearing.—The railway division of the Illinois Power Company, Springfield, Ill., is making less than 3½ per cent of its investment and last year fell $96,719 short of earning the 7 per cent return allowed by the State Commerce Commission, according to reports of accountants and engineers presented at a recent hearing. The increased fare proposed would retain the 10-cent cash fare, with tokens increased from four for 25 cents to seven for 50 cents and family fare books from $2 to $2.50 for strips of 40 tickets.

Foreign News

Bermuda to Have Electric Railway

Permission has been granted for the construction of a tramcar line in Bermuda, and it is planned to start work on it in the next few months. The ban has not yet been lifted on automobiles and motorcycles, so the single motor truck to carry freight remains the only representative of the automotive family.

"Antiquity, even in transportation facilities, is part of the stock in trade of Bermuda," says a bulletin from the Washington, D. C., headquarters of the National Geographic Society. "To the visitor this is one of the chief sources of its charm. There are no industries other than agriculture and catering to the tourist trade. The steamboat whistle and the clatter of horses' hoofs on the smooth hard roads are the only foreign noises that disturb the Sabbatical quiet of the island."

Plans Approved for Lisbon Subway

Concessions for the construction of a metropolitan subway in Lisbon, Portugal, has been granted by the Municipal Council of that city to a Spanish group. This concession comprises eight lines radiating from the Rocio Square over a total area of about 16½ miles. The hilly nature of the city will necessitate deep construction, but stations will be near to the surface and elevators need not be installed.

Vignole rails, 59½ ft. long with fish plates and weighing 90 lb. per yard, will be used, with a gage of 4.72 ft.

It is planned to build this subway in eight sections, each costing approximately $2,250,000. The Spanish engineers are now seeking an initial loan of foreign capital in the amount of $200,000 to defray the expenses of the first section built. It is proposed to finance the successive sections by capital flotations and local loans in Spain and Portugal.

National Electric Scheme for Great Britain

The general electricity supply plan which the British government is contemplating has some interest in the realm of electric traction, because if it is carried out many small power stations will be closed and energy taken from great economical stations.

The three main features of the new government scheme are large generating stations, a national board and distributing stations. The generating stations are to number about 60. The electricity produced by them is to be purchased by the board and sold to the distributing stations. Interconnecting power lines will be established by the board between the generating and distributing stations. Many small power stations will disappear. To allow interconnection between generating stations, it is proposed that a standard frequency of 50 cycles per second should be set up for the whole country. Cheap and abundant supply for all purposes is the goal, but it is recognized that a good many years must elapse before much benefit can accrue.

Many municipalities which have power stations and the steam railway companies which contemplate electrification will probably oppose the plan. If the plan is successful, many of the smaller tramway undertakings in the country should benefit from having a power supply from the national mains at a cheaper rate than they can produce for themselves.

Underground Railways for Manchester.—Proposals for the construction of underground electric tube railways in Manchester, England, are again being revived. The plan is for a circle railway with a central station, from which radiating lines would be constructed to the outside areas. The estimated cost is from £250,000 to £300,000 per mile.

Liverpool to Purchase Tramway System.—Purchase of the Waterloo & Great Crosby tramway undertaking has been decided upon by the Liverpool, England, City Council. This railway has been operated by the Liverpool Overhead Railway, but its lease on the lines will soon expire.

Electrification Planned in Czechoslovakia.—Contracts were placed recently for the first electrifying project of the Czechoslovakian State Railways. This comprises the electrification of the Prague railway stations and the connecting lines. A considerable part of this contract work has been placed with the Skoda Works, whose special department for electric railways has developed into the largest and most modern undertaking of its kind in Czechoslovakia.

Electric Train Test in Sweden.—Successful trial runs with electric goods trains took place recently on the Moholm-Falkoping section of the line between Stockholm and Gothenburg, Sweden, the electrification of which will soon be completed. Four trains were dispatched simultaneously in each direction, the longest consisting of 50 trucks. A fully loaded train maintained a speed of 37½ m.p.h., even on the steep grades on the line.

Trackless Trolley in Darlington.—Inauguration of the trackless trolley system in place of the tramways in Darlington, England, is now taking place. This is a complete substitution. The financial position of the municipal tramways would not permit the extensive renewals required. This tramway system was opened in 1904 and has never been financially successful. The type of trolley bus adopted is a single-deck, 31-passenger vehicle with a central door. The interior is divided into two compartments, one being used as a smoker.

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Recent Bus Developments

Plan at Buffalo Collapses—Railway Renews Offer

Plans of Ernest M. Howe, Detroit, and the American National Omnibus Corporation, New York, to establish 5-cent bus service in Buffalo over thirteen routes covering 71.5 miles of streets have collapsed following the failure of the company to complete its financing arrangements as ordered by the Public Service Commission. The company lacked $300,000 of the necessary $1,500,000 paid-in capital on the last day allowed by the state utilities board to complete its financing and appear before the commission for a hearing on its application for a permit.

With the announcement that the Howe plan had collapsed, Bernard J. Yungbluth, president of the International Railway, Buffalo, and its subsidiary company, the International Bus Corporation, said the traction interests plan to carry out the first steps of the co-ordinated bus-trolley plans filed with the Buffalo City Council last summer. These plans were held up by the municipal authorities when Mr. Howe entered the field with his 5-cent bus proposal, for which he later secured a franchise from the city.

The application of the International Railway and the International Bus Corporation on file with the city covers five of a dozen steps in a general plan for co-ordinated bus-trolley service. These are:

Establishment of a Best-North Street bus line and abandonment of the Best Street car line; establishment of a Richmond Avenue bus line and abandonment of the Hoyt Street car line; extension of the Bailey Avenue bus line from Kensington Avenue city line to East Seneca Street and over McKinley Parkway after the parkway is completed and abandonment of the Bailey Avenue car line; extension of the Delaware Avenue bus line from the Terrace to Shelton Square at Main Street; rerouting Delavan Avenue bus line, a cross-town service, over Potomac Avenue from Chapin Parkway, which will allow abandonment of part of the Forest Avenue car line from Delavan Avenue to Niagara Street.

There will be little opposition to the establishment of new bus routes and the extension of existing bus lines, but it is understood the City Council is opposed to the abandonment of car lines which have been long established, on the basis of the plan outlined in the Yungbluth proposals.

Allentown Bus Service Planned

In furtherance of a statement made some time ago by the Lehigh Valley Transit Company, Allentown, Pa., of its intention to adapt the bus to the transportation problem, comes the announcement from H. F. Dicke that a bus line operating on Turner Street, between Nineteenth and Seventh Streets, would be established as soon as the Public Service Commission granted the permit. The plans as they now stand call for a fifteen-minute service for two periods of three hours each in the morning and evening and a 30-minute headway during the rest of the day. Two buses will be used to maintain the former schedule and one during the so-called off-peak hours. A 10-cent fare will be charged. This will include transfer privileges to any of the company's lines. In opening the new line the company had in mind the accommodation of customers living far from present car lines.

In December of last year the company applied for a certificate to operate buses for "group and party service."

Railway Pays State Biggest Bus Bill

A check for $50,009, the largest bus license ever paid in the State of Minnesota and one of the largest ever paid in the United States, was delivered on Jan. 27 by the Twin City Motor Bus Company, Minneapolis and St. Paul, to Mike Holm, Secretary of State of Minnesota. This company is a subsidiary of the Twin City Rapid Transit.

The check is in payment of the 1926 license for 94 buses and four service cars operated by the bus company on its intercity lines as well as several suburban lines. This is a tax of 10 per cent on the list price, with a depreciation allowance of 10 per cent a year with a minimum tax of $350 for each bus operated.

The average fee is approximately $500 a bus. In addition to this state tax the company pays federal taxes of $20 a bus for the year May 1, 1925, to April 30, 1926. This is an additional tax of more than $8,000, or an aggregate tax of approximately $58,000.

Abandonment and Bus Petitions Before Utah Commission

The Utah Light & Traction Company, Salt Lake City, Utah recently applied to the Public Utilities Commission for permission to abandon its Davis County line, serving the towns of Centerville and Bountiful and intermediate territory. The application was in the form of a petition in intervention before the commission at the hearing of the application of the Bamberger Electric Railroad, which is seeking a permit to operate an automobile passenger and express line between Salt Lake and Ogden. It is requested that if the order of abandonment is permitted to the railway the bus line application of the interurban should be allowed provided the bus service will not pick up passengers in Salt Lake for discharge within the corporate limits of the city. If, however, the commission should refuse the petition in intervention, it is asked that the petition of the Bamberger company be denied.

Holyoke Railway Wins Point

The Holyoke Street Railway and the Interstate Bus Corporation, both of which have aired their differences in the county criminal and civil courts, have had their case settled by a triple bench of the federal court. Massachusetts bus control statutes were found to be constitutional, and the Interstate Bus Corporation is to be restrained from operating buses through Massachusetts cities without a license to do so. An injunction has been issued.

The Interstate Bus Corporation operates lines in all of the New England states except Maine. Its principal field of operation is in Boston and Providence. It recently brought proceedings into the federal court against the Holyoke Street Railway alleging collusion in interfering with the bus business in Holyoke, Mass. The suit was a counter one against the railway, which sought an injunction to prevent the bus company from operating.

The litigations began with a suit by the Holyoke company to prevent the operation of buses between Greenfield and Springfield, Mass. The suit was removed to Boston and warrants for the arrest of the bus company's chauffeur's followed. The bus company filed a complaint in an equity suit and obtained an order to show cause why an injunction to restrain the criminal prosecutions should not be granted. This order was given only after a long-drawn-out hearing.

Judges George W. Anderson, John A. Peters and Elisha H. Brewster ruled:

> These two cases have, by agreement, been heard together on agreed facts. They are, in effect, cross suits, and involve a single issue—the constitutionality of the Massachusetts statutes regulating the operation of buses in Masssachusetts highways. These statutes are stated, construed and sustained by the full court of Massachusetts in Barrows vs. Farnum's stage line, and need not here be restated.

Interstate Bus Service Curtailed in New Jersey

Acting on the complaint of the Public Service Railway, Newark, N. J., the Board of Public Utility Commissioners has ordered the Pierce Coach Corporation to discontinue the transportation of passengers between points within the state in connection with the operation of a bus line between Morristown and Orange and New York. In the absence of municipal permits authorizing local service, the carrying of passengers whose journeys begin and end in New Jersey was held to be illegal.

Gasoline Tax Increased in Kentucky

The Kentucky Legislature on Feb. 20 passed a bill in which the gasoline tax is increased from 3 to 5 cents a gallon. It was approved with a wide majority in both the House and the Senate. The measure was recommended by the Governor. The law is to become effective at once and continue until July 1, 1928, provided no succeeding Legislature may change the time limitation. Other bills are before the state to increase license taxes on buses and taxicabs, on the basis of a seat charge, greater than that now in effect.

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Cross-town Line in Fond du Lac.—The City Council of Fond du Lac, Wis., has accepted the proposition of the Wisconsin Power & Light Company to operate a cross-town bus line in that city. This bus system would work in harmony with the company's railway with interchangeable transfers. The application of the company was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 13, page 299.

New Line to Run.—The Lordship Railway, Bridgeport, Conn., has been authorized by the Public Utilities Commission to operate a new bus line between Avon Park, Stratford, and Bridgeport, connecting with its present bus route from Lordship to Bridgeport. Two buses are now operated on a one-hour headway.

Line to Be Replaced with Bus.—The Southern Public Utilities Company, Anderson, S. C., plans to replace its line to North Anderson with bus service. The line to North Anderson has been in service since the development of the northern suburb began several years ago. It was not stated whether the line had been operated at a loss or not, but it was said that the bus would prove more beneficial to the residents of that suburb.

More Buses at Asheville.—Any day now seven new passenger buses costing $11,000 each and seating 29 people will be put in operation in Asheville by the Asheville Light & Power Company. Some of the equipment will be put on the run between Asheville and West Asheville. The purchase brings the total number of buses owned and operated by the company up to nine. Decision to utilize buses rather than cars was reached after a conference with city officials in regard to the traffic situation.

Bus License Sought Again in Westfield.—The Springfield Street Railway is still seeking a bus license to operate in Westfield, Mass. The City Council has not yielded despite numerous meetings and long arguments. At least two members of that body are holding out for assurance that the railway will maintain one crosstown trolley line. The railway says such a line does not pay and will not promise to continue operating any line at a loss. To further the interest of the city of Westfield the Springfield company has signified its intention to replace all highways to the satisfaction of the highway department, if licenses are granted to operate buses.

Fare Increased from Eight to Ten Cents.—The Public Utilities Commission of the District of Columbia has authorized the Washington Railway & Electric Company to increase the fare on its Burleith bus line from 8 cents cash, six tokens for 40 cents and 2 cents for transfers between intersecting car and bus lines to 10 cents cash with tickets sold at the rate of six tickets for 50 cents provided that a free transfer, good on any intersecting car or bus line of the company, be issued in payment of 10 cents cash fare or on payment of one ticket fare and 2 cents. Transfers to the Burleith bus line will be issued by connecting car and bus lines for 2 cents only upon the payment of an 8-cent cash fare.

Financial and Corporate

$1,043,401 Net Income for Chicago Rapid Transit

Company Operating Elevated Lines Reports Progress During 1925—Expenses $199,600 Less than 1924

Gross revenues of the Chicago Rapid Transit Company, Chicago, Ill., for the year ended Dec. 31, 1925, representing combined operating and non-operating revenue, were $19,281,887, an increase of $505,954 over the previous year. Total expenses, including taxes and $241,906 for retirement reserve, were $14,967,509, or $199,600 less than the year before.

Net earnings were $4,314,378, an increase of $705,554. Interest, rentals and amortization of discount totaled $3,270,977, leaving net income of $1,043,401, an increase of $242,025 over the year 1924.

Dividends on the company's outstanding 7.8 per cent prior preferred stock were declared and paid to the extent of $308,529, leaving $734,871 as unappropriated surplus earnings for the year, no interest having been declared or paid on the company's adjustment debenture bonds. To this surplus should be added other net credits to profit and loss of $38,169 and the surplus of $958,672 from the previous year, making a total surplus at the end of the year 1925 of $1,731,713.

INCOME STATEMENT OF CHICAGO RAPID TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Passenger revenue		$17,786,474
Other transportation revenue		1,245,338
Gross operating revenue		$19,031,812
Operating Expenses:		
Maintenance of way and structures	$1,778,749	
Maintenance of car equipment	1,444,216	
Power	1,979,684	
Conducting transportation	7,006,823	
General and miscellaneous	1,135,721	
Total operating expenses		*$13,345,194
Net operating revenue		$5,686,618
Taxes, city compensation, etc		1,622,314
Operating income		$4,064,303
Non-operating income		250,074
Gross income		$4,314,378
Deductions:		
Rentals	$881,282	
Interest on mortgage debt and equipment obligations	2,277,380	
Other interest	†55,498	
Amortization of discount	56,816	
Total		$3,270,977
Net income for the year 1925		$1,043,401

SURPLUS ACCOUNT

Balance, surplus Dec. 31, 1924		$958,672
Net income for the year ended Dec. 31, 1925 (as above)	$1,043,401	
Less dividends paid on prior preferred stock	308,529	
Surplus earnings for the year unappropriated		$734,871
		$1,693,544
Miscellaneous debits and credits (net)		38,169
Surplus, Dec. 31, 1925		$1,731,713
*Total operating expenses include credited to retirement reserve.		$241,906.92

†No interest declared or paid on adjustment debenture bonds.

The rapid transit lines carried 216,045,575 revenue passengers in 1925, an increase of 3,144,551 compared with 1924.

One hundred new steel motor cars, ordered Dec. 19, 1924, were placed in service, the last of these being delivered on Nov. 23, 1925. These cars provide the maximum of comfort and safety and cost $2,268,840. The company now has 1,906 cars in service, including 1,862 passenger cars, of which 456 are all-steel construction. For the last ten years the company has been purchasing steel equipment in anticipation of a subway being built.

In September, 1924, the company requested the city for permits to extend all station platforms so as to allow eight-car train operation, which would substantially improve the service. Permits were obtained from time to time, but it was not until the city passed an enabling ordinance on July 22, 1925, that authority to extend all platforms was secured. The work was started the day following the passage of this ordinance and has been carried on continuously ever since. The work of extending the platforms on the Loop, Ravenswood-Kenwood, Howard-Jackson Park, Lake Street and Garfield Park lines has been practically completed. On the Douglas Park, Logan Square and Humboldt Park lines extensions will be completed soon.

While the number of passengers carried on the elevated lines in 1925 showed an increase, the ill effects of the handicap of inadequate loop terminal facilities became increasingly apparent. The company put into effect the only remedy available to it in the extending of loop platforms to accommodate eight-car trains. This has proved of considerable benefit in the rush-hour periods, but far from meets the situation.

On Sept. 27, 1924, the company publicly announced its policy of extending and enlarging its service by formally requesting the City Council of Chicago for consent to construct about 40 miles of specified elevated extensions, estimated to cost approximately $31,500,000. If such consent is obtained it is the company's intention to commence the work of constructing the extensions without delay and to complete the same as soon as practicable.

In addition the company, in order to obtain much-needed additional capacity for handling passengers in the central business district, has proposed to the City Council that if the city would build and grant the company the use of a rapid transit subway running from 22d Street north through the Loop district to North Avenue and connecting at both ends with the elevated lines, the company stood ready to enter into an agreement to pay to the city for the use of such subway a fair compensation

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either by way of fixed rental or a division of earnings. It is estimated the use of such a subway would enable the company, during the rush periods, to carry about twice the number of passengers it is now capable of carrying in such periods in and through the Loop.

On Nov. 16, 1925, work had progressed to the point where a considerable number of eight-car trains could be added to the service. The cost of this improvement, inclusive of platform extensions, changes in structure and car equipment and new equipment as previously stated, is $3,322,063.

On March 28, 1925, rapid transit service was extended to Dempster Street, Niles Center, the Chicago Rapid Transit Company having leased trackage rights over the new Skokie Valley line of the Chicago, North Shore & Milwaukee Railroad. This new line extends westward from the Howard Street station of the Evanston division and north to Dempster Street, Niles Center, a distance of 5 miles. It is believed that the territory tributary to this line will be rapidly built up and that it will soon become a valuable addition to the company's system.

A trackage lease was negotiated with the Chicago, Aurora & Elgin Railroad under which rapid transit service will soon be extended over that railroad to additional western suburbs of the city, including Maywood, Bellwood and the new community of Westchester.

For the purpose of defraying the cost of the new cars and platform extensions above mentioned and other corporate purposes the company during the year sold $2,212,000, par value, of first and refunding mortgage 6½ per cent gold bonds (series due 1944).

During the year the company paid off or acquired its underlying bonds and equipment obligations aggregating $1,117,000. This includes $231,000 first mortgage bonds of the Northwestern Elevated Railroad acquired for the sinking fund.

Attitude of Government on Non-Voting Stock

The government doubts if there is any way in which it can legaly meet the situation visualized by Professor Ripley in his campaign against non-voting stocks. Sec. 240 of the revenue bill, having to do with the consolidated returns of affiliated corporations, was before the Senate. The test of affiliation was a certain percentage of the voting stock. The Senate, by amendment, struck out the word "voting." High legal opinion is that this amendment resulted from the Ripley agitation and that "it will increase the tax difficulties of public utilities." Another view is that it sets up as a precedent the theory that the total stock is the test of affiliation, wherefore, in anti-trust suits, a similar test should lie, in which case unity of control through ownership of management, or "B" stocks would not be subject to attack if the "A" stocks were widely held. The argument seems a little far fetched, but it is worth noting.

Increase in Illinois Power & Light Preferred Stock

A special meeting of stockholders of the Illinois Power & Light Corporation was held on Feb. 23 for the purpose of submitting to the vote of the stockholders the question of increasing the authorized capital stock of the corporation by increasing the authorized par amount of the 7 per cent cumulative preferred stock from $30,000,000 to $40,000,000.

The sale of 7 per cent cumulative preferred stock of the corporation has been successfully continued during the past year to customers residing in the various communities in which the company's properties are located and through other channels, with the result that the present authorized amount of 300,000 shares of the par value of $100 each has now been nearly all sold and issued. The increased amount can only be issued upon approval by the Illinois Commerce Commission and upon condition that net earnings are not less than twice the annual dividend requirement on shares now outstanding and to be issued, and that the assets of the company after deducting liabilities shall not be less than $125 for each share, including the consideration to be paid for the new stock.

On Feb. 23 Blyth, Witter & Company, New York, offered $2,000,000 of the 7 per cent preferred issue of the company for subscription at $100 a share and accrued dividend. The balance for bond discount, depreciation and dividends in 1925 was $5,403,301 compared with $4,621,000 in 1924.

East Avenue Bus Operation at Rochester Unprofitable

The report of James F. Hamilton, president, for the year 1925 on the operations of the East Avenue Bus Company, a subsidiary of the New York State Railways, Rochester (N. Y.) lines, shows a deficit of $4,495.

The net operating expenses exceeded the revenues by $12,361, which, with taxes imposed, brought the net operating deficit to $13,226. Offsetting this loss in part was the sum of $10,290, which represents the non-operating income or the difference between the results of the operation of the Browncroft line, a part of the company's system, and the return of the 8 per cent guaranteed under the company's five-year contract with the Browncroft Realty Corporation.

The East Avenue Bus Company operates the East Avenue line, purchased in 1924 from an independent company. This route connects the heart of Rochester's business section with the suburban village of Pittsford, 10 miles to the east. It traverses East Avenue throughout, a street which for a mile is the center of the fashionable shopping district and thereafter the most exclusive residential street in Rochester.

The Browncroft line was established about a year ago, linking the business section with the exclusive subdivision of Browncroft, a 6-mile route. This line is patronized chiefly by well-to-do business men and their families and by late theater crowds, for whom special service is provided. At first a 25-cent

SUMMARY OF OPERATIONS OF THE EAST AVENUE BUS COMPANY, ROCHESTER

Operating revenues	$44,666
Operating expenses	57,028
Net operating deficit	*$12,361*
Taxes assignable to bus operation	864
Operating deficit	*$13,226*
Non-operating income	*10,290
Gross income	*$2,936*
Deductions from gross income	1,558
Net deficit	*$4,495*

*This item represents the difference between the results of operation of the Browncroft Bus Line and the return of 8 per cent guaranteed under the five-year contract with the Browncroft Realty Corporation.

Figures in italics denote deficit.

Conspectus of Indexes for February 1926

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Feb. 1926 **7.35**	Jan. 1926 **7.32**	Feb. 1925 **7.24**	Feb. 1926 **7.35**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	Feb. 1926 **155.3**	Jan. 1926 **154.3**	Feb. 1925 **153.1**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	Feb. 1926 **223.8**	Jan. 1926 **223.8**	Feb. 1925 **221.0**	Sept. 1920 **232.0**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	Feb. 1926 **201.9**	Jan. 1926 **202.2**	Feb. 1925 **203.9**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	Feb. 1926 **206.6**	Jan. 1926 **207.2**	Feb. 1925 **209.7**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Jan. 1926 **156 0**	Dec. 1925 **156.2**	Jan. 1925 **160.0**	May 1920 **246.7**	Jan. 1922 **138.3**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Bradstreet Wholesale Commodities 1913 = 9.21	Feb. 1 1926 **13.72**	Jan. 1 1926 **14.01**	Feb. 1 1925 **13.89**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Jan. 1926 **164.3**	Dec. 1925 **165.5**	Jan. 1925 **154.3**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Jan. 1926 **170 4**	Dec. 1925 **171.4**	Jan. 1925 **167.1**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Jan. 31 1926 **4.883**	Dec. 31 1925 **5.033**	Jan. 31 1925 **5.037**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	Jan. 1926 **19.63**	Dec. 1925 **20.20**	Jan. 1925 **18.59**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number	Jan. 1926 **2073**	Dec. 1925 **1628**	Jan. 1925 **2340**	Jan. 1924 **2231**	Aug. 1925 **1353**
Liabilities (Millions)	**48.23**	**43.11**	**64.44**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 144 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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fare was charged with no stops. After a few months the company cut the fare to 15 cents and stopped buses on signal.

The equipment is carried in the assets at $73,091.

Deficits in Portsmouth Must Be Wiped Out

The Portsmouth Public Service Company, Portsmouth, Ohio, suffered a deficit of $62,346 in 1925. This, added to the other deficits of the past three years, makes a total of $137,374 reported to City Auditor Ralmadge Edwards. James F. Loftus, general manager, in a letter accompanying the financial statement, declared that unless there was some "material change" in the number of car riders the outlook for the railway, as a money-making investment, was "far from encouraging." With a view to reducing the loss, the company is considering a number of changes, among them one-man car operation. This new system will likely go into effect on March 1. The company operates 37 miles of line and charges 7 cents for fare. No change in this rate is contemplated during the present year.

Receiver Liquidates First Mortgage Issue.—The entire issue of $50,000 Flushing & College Point Electric Railway first mortgage 5 per cent bonds due June, 1925, have been liquidated by the receiver of the New York & Queens County Railway, New York, N. Y. An order of the New York State Supreme Court authorized the receiver to pay not more than $850 for each $1,000 bond with all unpaid coupons attached. Fisk & Roberts, New York, negotiated the settlement with the bondholders, some of whom were represented by a protective committee.

$159,176 Decrease in Net at Detroit

Extraordinary Expenditures for Repairs and Advance in Wages Cut Down Municipal Railway Earnings

During the year ended Dec. 31, 1925, the balance of net income of the Department of Street Railways at Detroit, Mich., was $566,793, while for the year ended Dec. 31, 1924, it was $725,969, a decrease of $159,176. The balance of net income for the first six months of 1925 was $306,623, while for the last six months it was $260,169, but in the latter period $257,787 more was expended for repairs to tracks and cars than was expended in the first six months of 1925. Of this amount $102,207, is classed as extraordinary; another important matter was the increase in wage granted to the platform men, which amounts to about $150,000 increase over what was paid in the first six months for like service performed. Had no more been expended on repairs in the last six months than in the first six months, the balance of net income would have been $517,956.

The facts are taken from the financial statement of the Department of Street Railways of the city of Detroit, covering December, 1925, and the year ended Dec. 31, 1925, issued by W. M. Hauser, auditor. The system that has now been finally adopted by Mr. Hauser is to give the general balance sheet at the close of business on the last day of the month, and an income and statistical statement for the month compared with the corresponding month of the preceding year.

The balance of net income for December, 1925, is $78,876, after the payment of sinking fund charges. The balance of net income for the month of December, 1924, was $74,823, so that the past month shows an increase over that for December, 1924, of $4,052, or 5.4 per cent.

During the year ended Dec. 31, 1925, 481,236,694 passengers were carried by the rail lines and 10,951,951 by the coach lines, a total of 492,188,645 passengers, compared with a total of 458,540,992 for the year ended Dec. 31, 1924, divided 457,562,210 rail lines and 978,782 coach lines, so that the Department of Street Railways carried 33,647,653, or 6.8 per cent, more passengers in the year 1925 than in the year 1924.

Mr. Hauser points out that accrued depreciation has been provided in the accounts in the amount of $3,179,111, equal to about 3 per cent a year on the value of the depreciable property. This amount represents a transfer from surplus to a separate account and is invested in property.

In considering the subject of depreciation it should be remembered that this account admits of several definitions and usages, depending upon the purpose of its use and the attitude of mind of the user. In point of fact depreciation implies a decline in value; that is, diminution of productive or net earning capacity, it is cited. Obsolescence or inadequacy are not results of age or upkeen, for the reason that a street car or any other physical unit of the property, regardless of its age or maintenance condition, may become obsolete or inadequate, or both, at any time when in the best of judgment of the owners it is unsuitable for the service required.

With reference to the operating reserves for injuries and damages, the amount has been adjusted to $774,267; $700,000 has been credited back to surplus. Price, Waterhouse & Company, in their report rendered on Nov. 9, 1925, on the accounts of the Department of Street Railways stated that "from the information so obtained the reserve as at June 30, 1925, is more than 100 per

INCOME AND STATISTICAL STATEMENT OF THE DEPARTMENT OF STREET RAILWAYS AT DETROIT

Income	Year Ended Dec. 31, 1925	Year Ended Dec. 31, 1924
Operating Revenue		
Railway operating revenue	$22,413,689	$21,678,906
Coach operating revenue	818,328	51,282
Total operating revenue	$23,232,017	$21,730,188
Non-operating income	184,273	141,766
Total revenue from all sources	$23,416,291	$21,871,955
Operating Expenses		
Railway operating expenses	$16,572,497	$15,383,494
Coach operating expenses	786,557	41,701
Total operating expenses	$17,359,055	$15,425,195
Net revenue from all sources	$6,057,235	$6,446,760
Deduct		
Taxes assignable to operation	$705,615	$716,616
Other deductions	935	105,548
Interest on funded debt:		
On purchase bonds	$155,380	$161,033
On construction bonds	785,875	785,875
On addition and betterment bonds and notes	137,305	152,613
On purchase contract (D. U. R.)	854,662	916,810
Total interest	$1,933,224	$2,016,332
Total deductions	$2,639,774	$2,838,496
Net income	$3,417,461	$3,608,263
Disposition of Net Income		
Sinking funds:		
For purchase bonds	$133,000	$133,000
For construction bonds	571,351	565,654
For addition and betterment bonds and notes	358,798	396,121
For purchase contract (D. U. R.)	1,787,518	1,787,518
Total sinking funds	$2,850,667	$2,882,293
Balance for the period	$566,793	$725,969

Statistics	Year Ended Dec. 31, 1925	Year Ended Dec. 31, 1924
Railway revenue car-miles	52,863,111	48,248,330
Coach revenue coach-miles	3,529,795	157,540
Railway revenue car-hours	5,692,190	5,267,176
Coach revenue coach-hours	.....	.....
Railway revenue passengers	357,926,168	346,116,298
Railway transfer passengers	123,310,526	111,445,912
Railway total passengers	481,236,694	457,562,210
Coach revenue passengers	10,564,723	978,782
Coach transfer passengers	387,228	.....
Coach total passengers	10,951,951	978,782
Total revenue and transfer passengers	492,188,645	458,540,992
Railway operating revenue per car-mile, cents	42.40	44.93
Coach operating revenue per coach-mile, cents	23.18	32.55
Railway operating expenses per car-mile, cents	31.35	31.88
Coach operating expenses per coach-mile, cents	22.28	26.47
Railway operating revenue per car-hour	$3.94	$4.12
Coach operating revenue per coach-hour	.....	.....
Railway operating expenses per car-hour	2.91	2.92
Coach operating expenses per coach-hour	.....	.....
Ratio of transfer passengers to revenue passengers—railway, per cent	34.45	32.20
Ratio of transfer passengers to revenue passengers—coach, per cent	3.66	.....
Railway revenue passengers per car-mile operated	6.77	7.17
Railway transfer passengers per car-mile operated	2.33	2.31
Total railway passengers per car-mile operated	9.10	9.48
Coach revenue passengers per coach-mile operated	2.99	6.21
Coach transfer passengers per coach-mile operated	.11	.....
Total coach passengers per coach-mile operated	3.10	6.21
Ratio of railway operating expenses to railway operating revenue, per cent	73.94	70.96
Ratio of coach operating expenses to coach operating revenue, per cent	96.12	81.32

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cent in excess of the indicated requirement at that date."

In view of this it has been found proper, the auditor states, to effect an adjustment in this account. Claims paid and charged to the reserve account during the period from Sept. 1, 1921, to June 30, 1925, amounted to $582,001, while claims paid since July 1, 1925, to Dec. 31, 1925, amounted to $194,411, of which $134,881 was for accidents prior to June 30, 1925, and $59,529 for accidents subsequent to July 1, 1925.

While up to June 30, 1925, it was not the practice of the Department of Street Railways to set aside funds for the specific purpose of liquidating claims for injuries and damages, the basis of accounting has now been changed in this respect and appropriations of cash are now being made for the purpose of liquidating liabilities of this nature. At Dec. 31, 1925, $106,758 had been set aside in cash, so that of the $774,267 shown as reserved $106,758 is actually set up in cash.

The balance of net income at Detroit for January, 1926, is $56,698 after the payment of sinking fund charges. The balance of net income for January, 1925, was $52,551, so that the past month shows an increase of $4,147, or 7.9 per cent over January, 1925.

During January, 1926, 43,162,941 passengers were carried by the rail lines and 1,692,191 by the coach lines, a total of 44,855,132, compared with 40,145,926 in January, 1925, divided 39,889,805 rail lines and 256,121 coach lines. In other words, 4,709,206, or 11.7 per cent, more passengers were carried in January, 1926, than in January, 1925.

The five years of operation at Detroit since Feb. 1, 1921, is summed up by Mr. Hauser, auditor of the department, as follows:

In five years $45,327,701 was provided for capital cost. Of this amount $41,080,000 was provided by vote of the electorate now represented by $37,131,000 debt, $3,949,000 having been paid off from earnings. The sum of $4,007,971 was provided out of earnings, of which $3,691,113 represents accrued depreciation, the accrual being invested in property. The amount of $316,868 shown as profit and loss balance and $239,729 received from the sale of property go to help make up the total amount of $45,827,701, which is represented in the capital costs as follows:

Of the amount of $45,560,410, $44,293,545 represents road and equipment, $114,600 working funds and $1,152,264 material and supplies. In other words, the system fully equipped to do business has cost $45,560,410. This amount is in excess of the provisions made for it by $232,708. It represents the amount that the current and working liabilities are in excess of the current and working assets.

All sinking fund and operating reserves and interest requirements are funded 100 per cent, and specific cash and securities are now carried in funds to protect the sinking fund and operating reserves and interest requirements up to and including Jan. 31, 1926. In the case of the reserve for injuries and damages, the diversion of these funds by the former management for construction purposes has been replaced and made good.

The close of five years finds the department with the following:

Sinking fund, consisting of cash and securities for debt purposes	$5,392,290
Special deposits, consisting of cash for interest purposes	409,720
Insurance and other funds, consisting of cash for:	
(a) Injuries and damage purposes	798,845
(b) Repairs and renewal purposes	30,000
Total	$6,630,855

Outlook for Iowa Interurban Improved

The protective committee representing the holders of the first mortgage bonds of the Waterloo, Cedar Falls & Northern Railway, Cedar Falls, Iowa, has submitted to the bondholders a three years condensed comparative statement of operations of the company, as follows:

	1925	1924	1923
Gross earnings	$827,353	$860,308	$896,104
Operating expenses	750,899	792,602	828,385
Taxes	48,166	38,612	38,659
Net income applicable to first mortgage bonds	$28,288	$29,093	$29,060

The amount necessary to pay the annual interest on the outstanding $5,773,000 first mortgage 5 per cent bonds is $288,650.

The committee says that while on the surface the net income in 1925 was less than that of 1924, it is significant that the last quarter of 1925 showed a gross increase of $23,835 over the similar period of 1924, which encourages the hope that business conditions in Iowa—long depressed—have at last turned the corner. Earnings in January, 1926, exceeded those of December, the best month of 1925.

Long continued unfavorable business conditions in the territory served by the company, combined with aggressive bus competition, the general use of the automobile, and a falling off in coal and grain freights, are advanced as reasons for the decrease in gross earnings, while the high cost of operation and necessary outlays for maintenance, together with the necessity for meeting accumulated taxes and equipment obligations, have reduced the net income to about one-tenth of the amount required to pay the first mortgage bond interest. These considerations explain why the committee has thus far been unable to submit to the bondholders a plan of reorganization.

Up to date there have been deposited with the protective committee $5,188,000 out of a total of $5,773,000 outstanding first mortgage bonds and $2,170,000 out of a total of $2,333,000 outstanding common stock.

Receiver Appointed at Rockford

Adam Gschwindt, general manager of the Rockford Electric Company, was appointed receiver for the Rockford City Traction and Rockford & Interurban Railway, Rockford, Ill., under action instituted recently by trustee for bondholders of the two systems. Mr. Gschwindt has announced that his general policy will be to abandon profitless interurban lines and gradually to separate them from city lines, but there will be no immediate change in operating policy of the city lines. It was generally understood that the receiver had reference to the Rockford, Beloit & Janesville and Rockford & Freeport interurbans as lines to be abandoned. The receivership followed default of the interest payment on $1,650,000 of bonds, but bondholders are reported to have assured Mr. Gschwindt that they stand ready to back such improvements as he may determine. The Rockford Electric Company is one of the largest creditors of the traction systems. There was no opposition to the court's selection of the receiver.

New Directors in Alliance.—New directors of the Stark Electric Railroad, Alliance, Ohio, were chosen recently as follows : N. F. Glidden, Howard Morris of New York, James Bertran, W. S. Chittenden, L. W. Popp, E. W. Sweezy, O. K. Ayers and Charles Sebring.

Electric Plant Acquired.—Announcement has been made of the purchase of the Marengo Public Service Company, an electric company of Marengo, Ill., by the Illinois Northern Utilities Company, Freeport, Ill. R. T. Fry, Marengo, has been in charge of the local plant. The purchaser will take possession on March 1.

Companies Consolidated. — Seven companies which have been operated as subsidiaries of the Wisconsin Public Service Corporation have been consolidated with the main system and will conduct all business as the Wisconsin Public Service Corporation. Included in the group are the Green Bay Park Railway, serving Bay Beach Park and the River View Motor Bus Company, supplying interurban service between De Pere & Green Bay and city service in Manitowoc.

Receiver Sought.—Suit asking that the Indianapolis, New Castle & Eastern Traction Company, Anderson, Ind., be placed under control of a receiver and that Arthur W. Brady, present receiver of the Union Traction Company of Indiana, be named receiver, has been filed in the Circuit Court at Muncie, Ind., by the Fidelity Trust Company, trustee, holder of bonds aggregating $1,500,000 issued in June, 1912. The action was ordered transferred to Anderson, Ind. The Indianapolis, New Castle & Eastern Traction Company is operated under lease by the Union Traction Company.

Authorized Issues Under 1924 Amount. — During the twelve months ended Dec. 31, 1925, the California Railroad Commission authorized the issue of $132,036,749 of stocks, bonds, notes and other evidences of indebtedness. The total issue was below the amount for the last few years, $237,875,848 having been authorized in 1924 and $196,802,936 in 1923. Electric railway issues totaled $3,610,461 in 1925 compared with $13,067,496 in 1924.

City's Share Lower.—Ralph E. Carley, manager of the western division of the Illinois Power & Light Corporation, supplying Quincy, Ill., with traction service, recently submitted a report of the finances of the company's operation in that city, under terms of the ordinance which requires payment of 2 per cent of the gross earnings annually. The 1925 payment to the city was $5,226 from $261,343, the company's gross, which included $252,350 from street car lines and $8,993 from buses. Comparisons show a gradual and continued decline in earnings since 1920, when the city's share was $6,443; 1921, $5,682; 1922, $5,456; 1923, $5,470, and 1924, $5,238.

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Personal Items

J. R. Ong at Cincinnati

Former Railway Consultant Placed in Charge of New Department of Street Railway

Creation of a new department, to be known as transportation engineering, in charge of Joe R. Ong, has been announced by Walter A. Draper, president of the Cincinnati Street Railway, Cincinnati, Ohio. For several years Mr. Ong has resided at Piqua, Ohio, where he has engaged as a consulting electric railway transportation engineer. In his new capacity he will have charge of all traffic surveys, the making of schedules and will devote considerable time to studies in economies of operation. He also will have charge of general statistical data of an operating nature.

J. R. Ong

Mr. Ong has made a number of exhaustive traffic surveys in different parts of the country which have brought him into prominence as a consulting engineer. Notable among these was his work in Los Angeles, Cal.; Winnipeg, Canada, and Atlanta, Ga. He goes to the Cincinnati Street Railway with a record of accomplishments in all undertakings in which he has been identified. He has already assumed his new duties and is co-operating with J. B. Stewart, Jr., general manager, in working out a plan to secure the contemplated results of the new department.

From 1911 to 1912 Mr. Ong was superintendent of substations and assistant electrical engineer for the Fort Dodge, Des Moines & Southern Railroad, with headquarters at Boone, Iowa. The following year he assumed the duties of electric railway engineer, serving jointly the Railroad Commission of Wisconsin and the Tax Commission of that state on appraisals of public utility properties and in traffic and service studies on street railway properties in Milwaukee and other cities of the state.

In 1918 he became electric railway transportation engineer for the Board of Control of the Kansas City Railways and from 1919 to 1920 held a similar position with the Winnipeg Electric Railway, Canada. The following year he became electric railway transportation engineer for the Georgia Railway & Power Company, Atlanta, Ga., and held that post until 1923, when he became a consulting engineer with, headquarters at Piqua. In that capacity he made an exhaustive survey for the management of the Los Angeles Railway and studies in economies of operation for a number of other electric railways throughout the country.

Before going to college Mr. Ong served with the Indianapolis & Cincinnati Traction Company and the Chicago, Lake Shore & South Bend Railway. His first work after leaving college was done for the Westinghouse Electric & Manufacturing Company at its main plant in East Pittsburgh. Later he was transferred to the company's Philadelphia sales office.

Mr. Ong was born at Columbus, Ind. He was graduated from Purdue University in 1909 as an electrical engineer.

E. M. Hervey in Consulting Work

E. M. Hervey, connected with the Wisconsin Power & Light Company as manager of its Sheboygan electric and railway properties for the last three years, has resigned to enter business for himself as a consulting engineer in the power transmission field. In that work he has specialized for the past twenty years. Prior to his promotion as manager Mr. Hervey was the company's electrical engineer at Sheboygan.

Personnel Changes in Dayton

The annual meeting of the stockholders of the City Railway, Dayton, Ohio, was held on Feb. 11. As the company personnel is now constituted the officers are: J. M. Markham, president, whose election was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 20; H. S. Mead, vice-president; W. S. W. Edgar, secretary, and T. A. Ferneding, treasurer. The directors are: W. S. W. Edgar, T. A. Ferneding, J. M. Huffman, W. H. Kuhlman, J. M. Markham, H. S. Mead and V. Winters.

Thomas E. Howell remains as general manager and Edward H. Hartman continues as superintendent of transportation.

L. P. Fessenden Manager at Sheboygan

L. P. Fessenden, chief engineer and superintendent of the Sheboygan central station since 1912, has been selected to succeed E. M. Hervey as manager of the Sheboygan electric and railway properties of the Wisconsin Power & Light Company. Mr. Fessenden's responsibilities at the same time will be widened to include the district managership of all the company's properties in Sheboygan and Plymouth.

F. A. Richards Vice-President and Sales Manager American Car

Ford A. Richards, sales manager of the American Car Company since 1918, has been honored by the directors by also being elected to the vice-presidency. As sales manager Mr. Richards has enjoyed a wide acquaintanceship, particularly throughout the territory west of the Mississippi River, covered by his company for the Brill organization.

His affiliation with the electric railway industry dates back to 1898, when he entered the employ of the Peckham Manufacturing Company, then builder of electric railway trucks. During the intervening 28 years he has been engaged in various capacities, including that of assistant to the vice-president and foreign sales manager of the Peckham company and later as a member of a partnership under the name of the J. A. Hanna Company, formed to promote the sale of both cars and trucks.

Mr. Richards joined the Brill organization in 1909 as Pacific Coast sales manager with headquarters in San Francisco. He continued in this capacity until 1918, when he was transferred to St. Louis as sales manager of the American Car Company, which had become a Brill subsidiary in 1904.

F. A. Richards

As vice-president and sales manager Mr. Richards will continue, just as he has in the past, to devote his attention to the problems of the industry in that part of the country where he is so well known.

A native of Ohio, Mr. Richards was educated at the Uniontown High School, from which he was graduated in 1893, and at Mount Union College, Alliance. It may well be said that he has devoted his entire business life to the electric railway and affiliated manufacturing industries. His success is attested by his recent promotion.

Ernest Hatton has resigned as general manager and engineer of Newcastle-on-Tyne Corporation Tramways, owing to ill health. The municipality received the news with great regret. Mr. Hatton has held the post since 1905. During that period he has been responsible for carrying out important developments of the system. Before he went to Newcastle he occupied a similar position at Salford and was in

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charge of the work of electrifying the horse tramways there. Under his charge the Newcastle tramways have shown highly satisfactory financial results.

C. R. Harte A.E.R.E.A. Head

Impressive Career of Connecticut Company Engineer Dates Back to 1893 —Active in Association Work

Charles Rufus Harte, who has succeeded Roy C. Cram as president of the American Electric Railway Engineering Association, has been connected with the New York, New Haven & Hartford Railroad and the Connecticut Company continuously since 1893 except for a short period during 1901-04. All his life Mr. Harte has been active on the firing line. He has gone from one big construction job to another until one marvels at the capacity of the man to carry on uninterruptedly for so many years. He was really drafted into electric railway work as a result of the New York, New Haven & Hartford taking over the trolley lines in Massachusetts and Connecticut, and he had foisted upon him engineering and other problems which he himself readily admits he could not have solved had it not been for the co-operation of the officers of the company, notably Messrs. Storrs and Punderford, and his immediate associates.

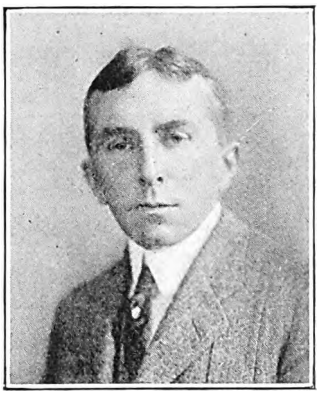
It would, indeed, be interesting to recount each of the man's achievements, but it is impossible to do more than to indicate them by giving the facts with respect to the various positions he has held. As the bare biographical data are disclosed the background will unfold itself not only to the engineer but to the non-technician. The degree of appreciation of the work of the man will vary between the two sets of readers, but each of them will finish with a keener realization of the abilities of the new president than he had before.

Mr. Harte was graduated from Columbia University School of Mines with the degree of civil engineer in 1893. He at once entered the construction department of the New York, New Haven & Hartford Railroad, being employed from 1893 to 1901 in positions of steadily increasing responsibility on the four-tracking and elimination of grade crossings between New Haven and the Housatonic River; on the elevation of the Providence Division and the new four-track connection, including the Back Bay station from Dartmouth Street to the South Station, Boston, and on the double-tracking of the Naugatuck Division from Derby to Naugatuck.

In 1901 he accepted a position with Stone & Webster. For them he put under construction the 33-mile urban and interurban electric railway at Sydney, N. S., extending into the adjacent mining settlements and to Glace Bay. This work included the construction of a power house and carhouse. For the same firm he supervised work on the heavy interurban extension from Terre Haute to Clinton, Ind.

He returned to the New Haven in 1904 and was placed in charge of the extensive improvements at New Haven. He developed the plans and started this work, but in 1906 he was placed in charge of the immense trolley construction program of the New Haven. In the four years that followed he supervised work on more than 100 miles of interurban type of trolley, the electrification of 50 miles of steam railroad track and the construction of more than 150 miles of transmission lines, together with power houses and substations, carhouses and miscellaneous structures. One of the carhouses included in this program of expansion was that at James Street, New Haven, with a capacity of 400 45-ft. cars. So far as is known, this was the largest single carhouse built up to that time.

In 1910, with the establishment of the



C. R. Harte

Connecticut Company as the trolley holding and operating subsidiary of the New Haven Railroad, Mr. Harte was transferred to it with the title of construction engineer, a position he has since held. Not long thereafter opposition began to develop to the New Haven's policy of developing the electric railway system to feed the steam road. When this opposition culminated in the separation decree of 1914, the construction program was correspondingly cut down, and the work of his department has been largely directed toward valuation, real estate and tax matters. Under the department, however, there was designed and built, among other things, the New Haven bus garage, one of the most up-to-date and best equipped electric railway garages.

Meanwhile the lack of any specification for overhead construction led to an immediate study by Mr. Harte along this line and the development of specifications which are the basis of the present A.E.R.E.A. standards, a result due very largely to the fact that manufacturers of material and contractors for its erection were invited to assist in the preparation of the code and did so.

Reverting to Mr. Harte's association affiliations he has been an active member of the A.E.R.E.A. since 1910, in which year he was a member of the committee on power distribution. Later he served two years as its chairman. He has been president and sponsor of the A.E.R.E.A. committee on heavy electric traction, joint sponsor of the engineering-accounting committee of that association and chairman of the standards committee of that association. He is senior electric railway representative on the American Engineering standards committee, American inductive co-ordination committee and the committee on revision of the national electrical safety code. He is vice-chairman of the A.E.S.C. and chairman of the rules committee of the A.E.S.C. He is electric railway vice-chairman of the American induction co-ordination committee. In addition he is a member of the A.E.R.E.A., American Society of Civil Engineers and an associate member of the A.I.E.E. Particularly in his work for the American Electric Railway Association Mr. Harte has striven to bring about the acceptance of standard practices. One of the things that he proposes to do in his new office is actively to promote the wider general application of the standards that have been evolved.

Journal Staff Expanded

Both the business and editorial staffs of ELECTRIC RAILWAY JOURNAL are strengthened by changes in the organization of the transportation unit, which comprises the JOURNAL and *Bus Transportation*.

L. F. Stoll, who has been sales manager of the engineering group of McGraw-Hill papers, comprising *Engineering News-Record, Coal Age, Chemical and Metallurgical Engineering* and *Engineering and Mining Journal-Press*, has been transferred to take executive charge of the transportation unit with the title of assistant vice-president.

Charles Gordon has been relieved of other duties in order to take direct charge of the editorial staff of ELECTRIC RAILWAY JOURNAL, with the title of editor. Morris Buck will continue as managing editor.

David Cameron, formerly sales manager of the two transportation papers, has been made a member of the advertising counselors' staff of the company.

T. F. Mueller is transferred from field work in the Detroit territory to the position of assistant sales manager in New York.

R. A. Feldon has joined the business staff as advertising representative in the Detroit territory.

These changes are part of a broad program for expanding the JOURNAL'S service to its industry.

C. D. Foltz Westinghouse Representative in Chicago

C. D. Foltz, representative of the Westinghouse Air Brake Company in charge of the Denver and Salt Lake City offices, has been appointed assistant western manager of the company, with headquarters at Chicago.

When only fifteen years old Mr. Foltz entered railroad work as a telegraph operator on the Wabash. In 1910 he became an inspector for the Westinghouse company in Salt Lake City and was afterward promoted to mechanical expert and representative at that office. In this position his field of activity was widened by the inclusion of the Denver office. His headquarters were moved from Salt Lake City to Denver during the year 1923.

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Tom Elliott Talks on the Electric Railway Outlook

Vice-President and General Manager of the Cincinnati Car Company Places Responsibility for the Future on Both Manufacturers and Operators—Holds Unlimited Power Available to Be Chief Cause of Heavy Equipment

AN INTERVIEW

By Charles Gordon

THOMAS ELLIOTT, vice-president and general manager of the Cincinnati Car Company, stands today with a background of experience that rivals fiction in its romance and typifies the rugged road over which many of the outstanding figures in the industry have traveled. Though entitled to rank as a veteran, he has retained a freshness of viewpoint and an enthusiasm that belie the marks which pioneering years have left.

His accomplishments as a car builder are too well known to require repetition. He has been a courageous advocate of light-weight construction and has consistently sought improved designs to give strength without excessive weight. Some of the outstanding installations of light-weight equipment that have made enviable records in reduced operating and maintenance costs have been the products of his enterprise.

I had frequently discussed the subject of car development with Elliott, but not for publication. Now that he had consented to an interview, I sought to sound the keynote of his thinking on structural design. My first question was fortunate in the sense of the response it provoked.

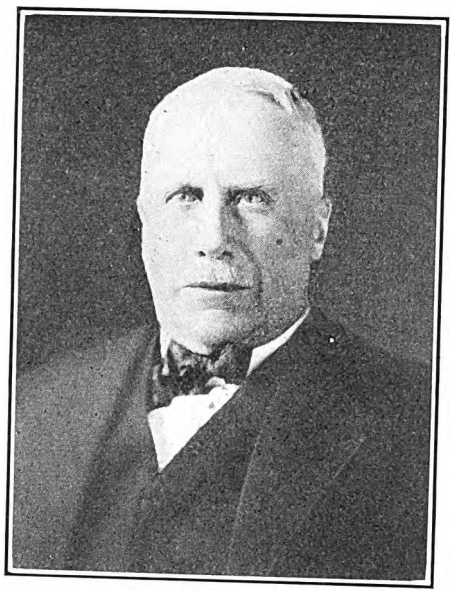
"What has constituted the greatest limitation to car construction development?" I asked.

"Lack of necessity and incentive," was the prompt reply. "There has been available with electric power an almost unlimited source of energy. Cars have consequently been merely assembled rather than scientifically designed. Excessive weight and high operating cost have been the result.

"As a mechanical and economic proposition," he continued, "transportation of people by rail is cheaper than on the highway, except when traffic is so extremely light that the investment in track is not justified. In view of the development of automotive vehicles and the rapid improvement of the bus, the time is getting short for railways to bring their properties up to date and for manufacturers to save their businesses by further improvement of their products. The opportunity will not continue indefinitely. Electric railways must be brought up to the modern idea of good transportation service."

This was, indeed, a frank statement on conditions in the industry. But Tom did not stop there. I had broached a subject in which he was keenly interested, and before I could put my next question he took me back a jump.

"Take the bicycle," he said. "In its day it was the finest designed and built transportation machine of which we have an example. It was largely instrumental in introducing the development of anti-friction bearings. Early bicycles weighed 175 lb. In their final form they were developed to the point where a 17-lb. vehicle carried a 200-lb. man with ease. This development took place when high grade material was scarce, but dependence on human motive power forced progress, because the bicycle which was easiest to propel was easiest to sell."



Thomas Elliott

Thus we traveled back in mind to a period beyond the advent of the automotive vehicle to the beginning of modern individual transportation machines. It is a habit Tom Elliott has of drawing illustrations for the analysis of modern problems from a sometimes forgotten experience of the past.

But despite this practice of drawing on past experience, he would not tell me his age. Nor would he allow me to guess it except on condition that I first matched my skill against his on fairway and green. But I knew his hobby and something about his score. Consequently I decided to omit his age. I can, however, record that he was born on a farm in the north of England. He landed his first job in the United States with the Hazzard Manufacturing Company at Wilkes-Barre, Pa. This company manufactured wire rope and cable. In those days wire rope for the propulsion of cable cars was coiled in continuous lengths on several flat cars for shipment. It was in one of these gangs that Elliott, with much ambition and little experience, entered what in an indirect way was a part of the transportation business.

For several years following he was employed in the shops of the Lehigh Valley Railroad. About 1888 he went to Tennessee to run a mine locomotive. He was delighted with the job, but it lasted only a week. His natural curiosity to know all about any piece of machinery with which he comes in contact led him to examine the inside of the boiler, and the next day he decided to look for work with a more attractive future.

Following this his experience was varied. He worked in a roundhouse at night. Then he took a job with the Knoxville Car Wheel Company. Later, a brief experience in dredge boat construction was brought to a sudden end by a flood which occurred on the Tennessee River.

As I proceeded to marshal my questions to draw out expressions of opinion, my mind reverted frequently to those early days of the Tom Elliott who now sat before me, still mentally objecting to the procedure of an interview for publication. But my interest lay largely with the future. I wanted his views on current tendencies and trends. So I asked about the status of the interurban roads of the country, which some people have claimed are headed for the scrap pile.

"There is no question but that they fill a fundamental need," he said. "Except in those instances where the lines were unjustified in the first place and should never have been built, they can be put on a profitable basis."

"Does properly designed light-weight equipment afford ample safety and comfort for average interurban condi-

THIS is the second of a series of interviews with the heads of car building plants and other prominent manufacturers. Rapidly growing interest in the improvement of electric railway equipment throughout the industry makes the views of these manufacturers particularly significant at this time. An interview with Samuel M. Curwen, president of the Brill Corporation, was published last week.

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tions," I persisted, wishing to draw him out further on this topic.

Apparently my question was well directed and touched on a subject to which he had given much careful thought. Tom leaned across the corner of his desk, and though he spoke deliberately, as is his custom, he raised his voice slightly and answered without mincing words.

"One of the reasons for the heavy cars operated on some interurban lines is the fear and dread of assuming the responsibility of our own convictions that is inherent in all of us. This has resulted many times in blind adherence to weight, not because it has been proved that heavy cars are safer in a collision or derailment, but rather because this has generally been considered as justification for relief from responsibility."

I was impressed by this answer. Here was the basis on which Tom Elliott has built many light cars for interurban service—some for operation at speeds up to 60 m.p.h. I began to probe deeper for some of the earlier experiences and associations that lay behind this courageous statement.

Won to Electric Traction

It was while working as master mechanic and chief engineer of a cotton mill in Knoxville that Elliott began to hear about strange experiments on electric cars in Scranton. He listened at that time with a mixture of skepticism and interest. It may have been his early association with local transportation in the cable coiling days, or merely that strange fascination which the romance of transportation weaves, but in any event Tom continued to follow the news of these experiments.

W. G. McAdoo, later Secretary of the Treasury in Woodrow Wilson's Cabinet, bought the horse car lines in Knoxville and began to electrify them. Elliott watched with particular interest the construction of the power house. When the first car was finally operated under the new power in the streets of Knoxville he was convinced that he wanted to be a part of this new industry. M. R. McAdoo, brother of the owner, was the manager of the railway. Tom hunted him up and landed a job running the power plant.

That did not keep him busy long. With characteristic thoroughness he soon had leaky steam pipes tight and commutators bright. The job of welding an oil can looked like only a side line to one with as many ideas as Elliott. He bought a lathe and set it up in the engine room. Later he fixed up a brass furnace in one corner and started casting and finishing trolley wheels. Soon he began to rewind motor armatures in the power house. Ultimately, all of the car repair work was turned over to him.

In 1891 Elliott went to Atlanta with McAdoo. Here, two years later, he used what were then, so far as he knew, the first solid gears applied to car axles without keys. Some time later he began to build cars in the Atlanta shop. On the first of these the width of the customary side sill plate was increased from 6 in. to 18 in. In 1896 this plate construction was extended to the belt rail to form the continuous side girder type of construction that is even now so generally used. The idea came from watching a repair man who used a wide plate to cover a gash in the side of a car.

During this early car building experience Elliott began to favor the use of steel as a material for increasing strength and reducing weight in cars. On the interurban line operated at that time by the Atlanta company the single-truck cars had proved unsatisfactory from the standpoint of riding qualities and ability to stay on the track at satisfactory speed. Tom built some double-truck cars. As cars go today, they were heavy. They had four 50-hp. motors each, but their excessive weight made it impossible to run them to the end of the line due to the limited distribution copper available. "Here," Tom says, "was born a high regard for the importance of weight reduction in cars."

Having again thus built up the background, I swung once more to present-day conditions.

"Is there any difficulty in financing purchases of new cars where a railway is otherwise limited in its ability to sell its securities?"

"There is no difficulty. Proper financing arrangements for cars can be readily consummated."

Still I was not satisfied.

"Do you have any difficulty in disposing of electric railway equipment trust paper?"

"None whatever."

There were no qualifications in these answers; thus encouraged, I put my next question.

"In your opinion, does demand for individuality or inertia on the part of railway managements stand in the way of car development?"

Railways After Improvements

"My experience has been that railway managements are eager for new developments and that they will take any good scheme—and half of the bad ones—suggested by a car builder. They are looking for improvement and are willing to assume a large part of the trouble and expense of experimenting with new developments. The railways are hungry for new ideas."

Thus Tom Elliott proceeded to explode any assumption that operators are not interested in new developments advanced by the manufacturers. He had told me before this of his experience back in the days when the mechanical men in operating companies frequently worked with the crudest of facilities. Consequently, to me, his optimistic outlook on the demand for development was refreshing.

There are interesting anecdotes of Tom's early experiences as a master mechanic in Atlanta. When he first went to work there he found that the master mechanic was provided with a stable, several horses and a negro driver. Elliott had little use for these trappings of Southern luxury. He decided that the stable would make a good foundry. Acting on this idea, he succeeded in buying an old cupola for $35, incidentally including in the bargain a three-chime steamboat whistle, worth at that time about $200. He used trainmen apprentices who were sent to the shop for instruction to move his cupola and set it up. When the general manager discovered the character of training his new platform men were receiving Tom lost a fine source of cheap labor. He finally rigged up the cupola with an old railway motor and a good housing for a blower and began to make chilled iron wheels that had a life varying from three weeks to five years. Sand for molds was dug in a lot near the foundry.

Elliott left Atlanta in 1901 with M. R. McAdoo and went to the West Penn Railway, first as superintendent of motive power and later as manager. In 1903 he accepted a position with the Cincinnati Traction Company, some two years after W. Kesley Schoepf had taken charge of the property as president. Tom was chief engineer in charge of car maintenance, overhead line and power stations.

A short time before the Cincinnati company had started building cars in its new shops, a plant much larger than was needed for maintenance work alone. Tom became engaged in many outside jobs for his superiors, in addition to his regular duties. He was frequently brought into contact with the car building plant. Finally he was delegated to find a man to take charge of car building. After ten days, without success, he was called into the office and given the job himself. As a result he began devoting his entire attention to the car plant.

Co-operation Needed by Buyer and Builder

I asked Elliott whether, in his opinion, operating railways are justified in building their own cars under present conditions. There are several interesting thoughts in his reply.

"This depends entirely upon whether they can build a better car than they can buy. It is apparent that an operating management never makes its reputation by car building. Its primary job is to give good transportation service. When it engages in the work of building cars it diverts the attention of much of its personnel from operation and maintenance to manufacturing. Proper co-operation between operating companies and the car builders will result in better equipment than either can produce alone. Car builders are more familiar with the engineering features of design. Operators have the necessary experience to suggest improvements that make equipment popular with passengers and low in operating and maintenance cost.

"One primary disadvantage in a railway company building its own equipment," he continuel, "is that it does not get the benefit of the constructive criticism of other operators that is freely made to car builders."

Here seemed to be good thinking, unbiased by commercial expediency. It suggested another question.

"What, in your opinion, is the life of electric railway cars?"

"With proper maintenance, their life is indefinite. Retirement will take place due to factors outside the cars themselves. These include more suitable dimensions and operating and maintenance economies made possible by improvements in design, to say nothing

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of increased attractiveness of new equipment resulting from development of the art. These factors, rather than the actual wearing out of the cars themselves, will dictate replacements."

Tom had shown throughout our discussion a definite tendency to place on the shoulders of the manufacturers themselves a large part of the responsibility for the future progress of the industry. As we came to the final question on the outlook for car building business in 1926, he maintained this position by summarizing his viewpoint in these words:

"There is now an active demand for new and improved types of cars. The extent of the business that will be placed during the year 1926 is largely dependent upon the efforts exerted by car builders to develop and sell their products."

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Bids Asked for 300 Cars and 150 Buses at Detroit

Awards impend at Detroit for more than $4,000,000 of car and bus equipment. H. U. Wallace, general manager of the Department of Street Railways at Detroit, Mich., has emphasized to the Board of Street Railway Commissioners the urgent need of the department for additional equipment. In a letter to the board on Feb. 22 Mr. Wallace said that every unit owned by the Department is now in constant service and in addition the department is renting 50 additional motor cars and trailers from the Detroit United Railway in an effort to meet the heavily increased demand for service. In spite of these efforts, however, the service falls short of adequately filling the demands. According to Mr. Wallace, at the present time the city system needs at least 100 additional cars.

He says that approximately 150 of the cars now operating are so worn out and obsolete that their operation represents a current liability in the form of excessive maintenance and upkeep costs. These cars should be scrapped immediately and replaced. Furthermore, the department will need an additional 150 street cars or large buses to meet the future demands of next fall and take care of the rapid population and territorial growth of the year.

Mr. Wallace says that in considering the motor coach problems it is apparent that the city system will need 75 additional large buses to handle present business satisfactorily and on a conservative estimate will require 50 more buses to establish additional routes in certain sections of the city which are urgently in need of transportation facilities.

In consequence he has recommended that the city advertise for prices and terms on the following equipment: 300 new street cars, with six months option on 150 additional cars; 150 new large double-deck buses, with six months option on additional buses.

Mr. Wallace says:

> As soon as we get these bids we will be able to determine what kind of terms we can get on the purchase of this equipment, and after obtaining the terms we can then definitely decide on the amount of equipment to purchase at this time.
>
> From various conferences that we have had with bus manufacturers and car manufacturers we have been led to believe that we will be able to procure equipment on terms that will permit of our paying for all of this equipment either out of the earnings from the equipment or out of the saving that we can make in the cost of operating new, light, modern cars in place of our present heavy and obsolete units.

The board has approved the request made by Mr. Wallace and the Department of Street Railways advertised on Feb. 24 for bids for the equipment mentioned by the railway manager in his letter. The awarding of the contracts is of course subject to approval by the City Council.

Brill Report Misquoted

In the digest of the report of the J. G. Brill Company published in the ELECTRIC RAILWAY JOURNAL for Feb. 13, page 307, the item of cost of operation was misstated due to the transposition of the figure of $560,938. The paragraph in which this figure appeared as contained in the report and as it should have been presented in the JOURNAL read:

> After deducting from earnings all cost of operations, including maintenance and repairs and depreciation for the year amounting to $560,938 and after setting aside out of earnings reserve for federal income taxes, not yet due, of $82,791, the result of the operations of all the plants of your company shows a net profit for the year of $571,269.

Ohmer Company Is Active

With its factories working day and night in an effort to keep the total of unfilled orders to a minimum, the Ohmer Fare Register Company, Dayton, Ohio, reports the volume of sales for the month of January to be considerably greater than any previous month in its history. More employees are engaged at the present time than has been the case since the close of the war. As compared with this time last year, there is an increase of 30 per cent in the number of men employed.

January was also the biggest month for export business in the history of the company, it was reported. Many large orders were received from Australia, New Zealand, South and Central America, England and Canada. The new types of ticket-printing fare registers for electric and steam railroad companies and motor bus lines, which were recently announced, are attracting attention from transportation officials throughout the world, and are being manufactured in increasingly largely numbers. It is anticipated that 1926 will prove a record year for the Ohmer Company.

Prize for Industrial Advertising Urged by Harvard Award

Recommendation for the establishment of an award for the best advertising campaign of industrial products was made on Feb. 22 by the jury of awards of the Harvard Advertising Awards, founded by Edward W. Bok. At the same time the names of the winners of awards already established in 1925 were announced by Wallace B. Donham, dean of the Harvard Business School. The annual award consists of cash prizes totaling $11,000 and a gold medal. The latter was awarded to Ernest E. Calkins, president of Calkins & Holden, Inc., New York advertising agency, for distinguished personal service to advertising.

Cash awards cover various phases of the advertising field, such as the national campaign most excellent in planning and execution; the most excellent local campaign of a manufacturer; research and development of an index of effective buying power for consumers by counties in the United States; distinguished individual advertisements, etc. It is significant that the jury of awards felt it advisable to recommend an additional award to stimulate excellence in industrial advertising.

The adoption of this recommendation would naturally mean a reapportionment of awards in existence at the present time.

Pennsylvania Orders Electric Passenger Locomotives

Contracts on all the motive machinery, controls and other electrical equipment for six large electric passenger locomotives and two double-cab switching locomotives have been awarded by the Pennsylvania Railroad to the Westinghouse Electric & Manufacturing Company. This equipment will be shipped to the Juniata shops of the Pennsylvania Railroad at Altoona, where the entire group of eight locomotives is to be built.

The six passenger locomotives, which have a continuous rating of 3,730 hp. each, and compare as regards both tractive effort and speed with the greatest steam locomotives in existence, will be put into operation in the New York division hauling heavy passenger trains between the Pennsylvania Terminal, in New York City, and Manhattan Transfer. These locomotives are in addition to two others of a similar type placed in service at Manhattan Transfer in 1924.

Design of the new equipment was handled by the engineering staff of the motive power department, Pennsylvania Railroad, under the personal direction of its chief, J. T. Wallis. The passenger units have a 2—8—2 wheel arrangement with a so-called "steeple" type cab construction. Motors are arranged two per jack shaft, and are mounted outside, and at either end, of

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the driving wheelbase. Each jack shaft serves two pairs of drivers, the latter of which are 80 in. in diameter, or approximately 1 ft. higher than the average man. The connection between the motors and the jack shaft is by means of pinions and flexible gears. The gear ratio of the locomotives will permit a sustained speed of 70 m.p.h. When delivered and ready for service each locomotive will weigh approximately 400,000 lb., with a total length of 68 ft.

The two electric switching locomotives are of the so-called double-cab type for general yard work, of which quite a number already have been designed and ordered.

Purchase of Enormous Copper Smelter Announced

Hyman-Michaels Company, Chicago, Ill., announces the purchase through the United Commercial Company, San Francisco, of one of the largest copper smelters in the world. The purchase covers the Mammoth, Keystone and Kennett properties of the United States Smelting, Refining & Mining Company, located at Kennett, Cal. In addition to the plants, the purchase covers all personal properties, including a considerable amount of trackage and railroad equipment.

Pressed Steel Car Company Merges with Subsidiary

Stockholders of the Pressed Steel Car Company have approved the plan recently submitted by directors whereby a merger with Western Steel Car & Foundry, a subsidiary, will be effected and the company recapitalized. The name Pressed Steel Car will be continued. When the plan is consummated Pressed Steel Car Company will have an authorized capital of $16,200,000, par value, cumulative 7 per cent preferred and $46,300,000, par value, common stock, with outstanding issues of $15,000,000 preferred and $12,500,000 common.

Rolling Stock

Memphis Street Railway, Memphis, Tenn., has placed an order with the St. Louis Car Company, St. Louis, Mo., for 32 single-end cars, 46 ft. long.

Roanoke Railway & Electric Company, Roanoke, Va., an American Electric Power Company property, has ordered from the J. G. Brill Company six 28-ft. closed motor cars equipped with Brill 77-E trucks.

Tampa Electric Company, Tampa, Fla., has included in its 1926 budget the purchase of 25 double-truck cars. This item of the expansion program alone represents an expenditure in excess of $300,000.

Worcester Consolidated Street Railway, Worcester, Mass., needs 77 new cars, according to a recent survey made there, to bring the rolling stock equipment up to present-day requirements. The proposal now made is for the use of light-weight one-man, two-man cars. Reference is made elsewhere in this issue to the survey under which this fact and others with respect to service and equipment in Worcester were brought out.

Chileña de Electricidad, Santiago, Chile, has ordered from the Brill Company 30 28-ft. 3-in. closed car bodies to be equipped with Brill 177-E trucks.

Georgia Railway & Power Company, Atlanta, Ga., ordered in January of this year ten new one-man cars for its interurban line. The specifications of these cars follow:

Builder of car body	Cincinnati Car Company
Type of car	Single-end, double-truck interurban safety car for two-car train service
Seating capacity	51
Weights:	
Car body	18,000 lb.
Trucks	9,880 lb.
Equipment	8,365 lb.
Total	36,245 lb.
Bolster centers, length	26 ft. 3 in.
Length over all	45 ft. 6 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	11 ft. 8 in.
Body	All steel
Interior trim	Light mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Safety Car Devices
Armature bearings	Sleeve General Electric
Axles	Brill Company Cambria hammered steel
Bumpers	Pressed steel
Car signal system	Faraday
Car trimmings	Bronze oxidized, Dayton
Center and side bearings	Brill, center bearings; Stucki, side bearings
Compressors	Western Traction Brake Company DH-16
Control	General Electric PC 5-K2
Couplers	Tomlinson, Form 10, car, air and electric
Curtain fixtures	Curtain Supply No. 90, pinch fixture, Rex rollers
Curtain material	Pantasote, grain Morocco, color No. 86
Destination signs	Keystone JRR and ILR
Door-operating mechanism	National Pneumatic
Energy-saving device	Economy meter
Fenders	H-B wheelguards
Gears and pinions	General Electric A-1
Hand brakes	Peacock staffless
Heater equipment	Unsettled
Headlights	Ohio Brass SDH roof type
Journal boxes	Brill
Lightning arresters	General Electric Aluminum A-11
Motors	Four GE-265-A, inside hung
Registers	Ohmer
Sanders	Ohio Brass, Form 2
Sash fixtures	Dayton wedge type
Seats	Hale & Kilburn 900A bucket type
Seating material	Genuine gray leather
Slack adjuster	American automatic
Springs	Brill Company
Step treads	Aluminum, Cincinnati Car
Trolley retrievers	Knutson 5-B
Trolley base	Ohio Brass, Form 4
Trolley wheels	Nuttall 6 in. diameter
Trucks	Brill 177-E-1
Ventilators	Nichols-Lintern Company type C
Wheels	26 in. steel E-26-S
Special devices	Signal lights; push-button control of doors, variable load brake, compensating fixture dome lights

Metal, Coal and Material Prices

Metals—New York	Feb. 23, 1926
Copper, electrolytic, cents per lb	14.25
Copper, wire base, cents per lb	16.00
Lead, cents per lb	9.10
Zinc, cents per lb	8.07
Tin, Straits, cents per lb	64.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.875
Somerset mine run, Boston, net tons	2.10
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.125
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	17.75
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.60
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$0.98

Trade Notes

Kelly, Cooke & Company, Philadelphia, Pa., have announced a change in location for their headquarters. Formerly located at 424 Chestnut Street, they have now taken offices in the Insurance Company of North America Building, the Parkway at Sixteenth Street.

Leon L. Wolf, president of the Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio, has announced the appointment of Edwin Besuden to be sales promotion manager. Mr. Besuden formerly was connected with the Jewett Motor Car Company. He is well known among electric railway men. He will spend most of his time in the field, further stimulating the widening market for Wolf Kemi-suede, the new waterproof material for upholstery purposes in the automotive and electric railway fields.

Farley Osgood, for many years prominently identified with the electric light and power industry, has established consulting engineering offices in the National Bank of Commerce Building, New York. He will engage more particularly in the design, construction, operation and interconnection of public utilities. Mr. Osgood has been especially active in the affairs of the American Institute of Electrical Engineers and was signally honored with the presidency in 1924-1925. He is widely known as a remarkably able engineer.

Reo Motor Car Company, Lansing, Mich., states that, exclusive of administrative expenses, a fleet of six Reo 21-passenger six-cylinder model W buses has been operated in South Bend, Ind., at a cost of only 8¾ cents per bus-mile by the Chicago, South Bend & Northern Indiana Railway. Information as to operating costs was obtained from a statement recently made by George R. Green, general superintendent of the railroad. The fleet has been in operation since February, 1925.

New Advertising Literature

Electric Controller & Manufacturing Company, Cleveland, Ohio, has issued a leaflet which illustrates various applications for E, C & M separator magnets. Installation methods are also treated. Copies will gladly be supplied on request.

Metallo Gasket Company, New Brunswick, N. J., has issued catalog No. 26, entitled "Metallo Gaskets." In this are described various types of gaskets for use in pipe joints, air pumps, boilers, hand hose, and wherever else this equipment may be required. Gaskets for high and low pressure work and for ordinary and extreme conditions are available.

Korfund Company, Inc., New York, N. Y., has issued a bulletin entitled "How to Isolate Machine Vibrations." This points out the disadvantages of attempting to operate machinery without adequate protection from size and vibration, and states that Korfund plates of coarse natural cork are admirably adapted to meet these problems.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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So Those in the Industry May Know

EVIDENCE continues to accumulate of the misinterpretation by the daily newspapers throughout the country of the facts with respect to the recent bus applications made in New York City. It is true that in some of the elements which it contains the joint offer made on behalf of the New York Railways and the Fifth Avenue Coach Company does differ from similar offers made in the past, but it does not presage the passing of the street car, as many of the newspapers have concluded in their editorial comments.

It cannot be expected that editors distant from New York will be informed about transit matters in that city. The whole situation is extremely complicated. A recapitulation of the bus offers, made some time ago, disclosed that there were more than 50 on file. Others have come in since then. Commentators on the latest offer should bear in mind that the 25 miles of track, whose use it is proposed to discontinue, represents only about one-fourth the total mileage of the system. Most important, however, the plan does not represent an idea that is new. There have been similar replacements elsewhere in the past, proportionately as great, but the railway has remained the backbone of the system. Moreover, sight must not be lost of the fact that under the latest bus proposal the fares will be both 5 and 10 cents, whereas the present carfare is 5 cents.

These comments are not intended to be critical of this particular application or any of the others. It is easy to see what a colossal task it would be to analyze and compare all the offers made. As a matter of fact, this is a work upon which the city has been engaged for months. The problem of deciding what is best for the city is the concern of the Board of Estimate. When that decision has been made the New York Transit Commission will then have its say. No matter what the city of New York may do, the commission will undoubtedly exercise authority that will fit the proposal accepted by the city into the general plan designed to better transportation facilities in the city.

One thing and only one thing is here intended. That is to call the attention of street railway men everywhere to the importance of learning the facts about the New York proposal and making every effort to disseminate them in their own communities. There has been an alarming tendency on the part of the daily press to jump at conclusions. Such phrases as "the beginning of the passing of the street car from the leading cities"; "it costs less to operate the buses"; "adoption of the bus in populous American communities is daily becoming more expedient"; "there's a lesson in this—the trolley is obsolescent," are all too frequent in the daily press comments on the New York proposal.

To turn the tables on these critics by using almost the very words of one of them, there is a lesson in this, but it is not the unusual lesson which most of them make it out to be. It is the lesson not of wholesale replacement, but the lesson of the proper articulation of the two methods of transportation and of the use of each under conditions which dictate a choice between the two. It is up to the individual railway operator to correct any comment in the daily papers in his territory based on conclusions which start with a wrong premise. No silly statements similar to those quoted should be permitted by them to go unchallenged.

Full Knowledge of the New York Bus Plan Desirable

INTERESTS of the New York Railways and the Fifth Avenue Coach Company have joined to form the newly organized New York City Omnibus Corporation for the purpose of operating a co-ordinated rail and bus service in Manhattan. There is included in the Omnibus Corporation's plan a proposal to eliminate some 25 miles of street car lines in favor of buses. This is out of a total of some 88 miles. In the proposal is also the suggestion that additional surface rail lines may be removed in favor of buses whenever this becomes practicable.

There exists now in New York a keen competition for bus franchises, and various contenders are making strenuous efforts to devise terms that will win the coveted grants and at the same time permit operation to be carried on at a profit. Unless operation is at a profit service will quickly become crippled by the inability properly to maintain equipment.

It is apparent that the proposal of the Omnibus Corporation includes considerations that may work to induce the city administration to grant this company a franchise over other contenders. In this effort, steps may be proposed which in themselves would not be considered were not the matter of protecting existing investment by control of bus operation on Manhattan Island at stake.

Again, there is another important factor in the proposal to abandon some rail lines. The particular lines in question are not profitable. In fact, they haven't had a chance for many years. True, there are perpetual franchises, but they provide for a 5-cent fare and many other operating handicaps. At the present time the north and south traveler in Manhattan has only the choice of a crowded rapid transit system, a slow surface car or an expensive automobile. There has been no provision for any intermediate form of transportation which would be more comfortable or attractive than the congested rapid transit lines and

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at the same time much less expensive than an automobile or taxicab. The north and south surface lines might well have supplied such service, but the arbitrary fixed 5-cent fare has stood like a stone wall in the way of improvement.

There has been one exception to this condition, namely, the operation of the Fifth Avenue Coach Company at a 10-cent fare. This service has been popular not because of its speed, but because a passenger may make his trip without the indignities of crowding. The provision of such a preferred transportation service is a proper function of the bus. The bus offers a solution of the situation under the proposal to substitute 10-cent bus lines that are expected to permit a character of service that will supplement rather than duplicate that of the rapid transit lines. The proposal seems a logical one under the circumstances, but similar conditions encountered are not found in any other city in the country.

Certain proposed crosstown lines are designed strictly as feeders to north and south bus lines or other transit agencies. Here the hauls are very short and no attempt to provide a preferred service is contemplated. A 5-cent fare will be charged on these buses with an additional 5 cents for a transfer to the north and south lines. The plan is a good one from the standpoint of providing more and better distribution of crosstown transportation. This is an important requirement in New York. The peculiar combination of street spacing makes a bad transit problem at best, and the crosstown bus lines will help materially.

Much more could be added regarding the restrictions which have been placed on street car operation that tend to favor the use of buses. The expensive conduit construction is in itself a handicap to car operation. Street traffic conditions are more severe in New York than in the majority of American cities. Unregulated parking exists on many streets, cutting down the effective roadway. Speeds are necessarily very slow, particularly on the crosstown streets.

But these subjects are technical and in a sense they are details. The important fact is that the proposed bus plan for New York is designed to meet unusual and peculiar conditions that are common alone to that city, and reflect in no sense a comparison of the relative merits of bus and trolley in municipal transportation. Here the bus is being fitted into a particular situation in which it seems to offer certain advantages. There is nothing new or significant in this as regards the bus-trolley situation. A similar process is going on in various parts of the country, where unprofitable sections of rail line have been abandoned and bus service substituted where it is suitable. This is in accordance with what has been generally recognized as good practice in the application of the bus.

The primary danger now is from curbstone transportation experts who do not understand the situation. There is danger that hasty generalizations may be made on the basis of the action proposed for decidedly specialized conditions. Electric railway executives owe it as a duty to their communities and properties to make every effort to acquaint their communities with the facts. They will at the same time be doing a service in the interests of the development of the bus by preventing the popular mind from being misled regarding its proper functions as a transportation agency.

There Still Is Room for Modernization and Merchandising

FUNDAMENTAL soundness underlies the electric railway business. This was conceded by speakers at the first sectional conference of the Advisory Council of the American Electric Railway Association, held at Chicago last week. It was the feeling, however, that the public has not been sufficiently impressed with the need for public transportation. At any rate, work remains to be done in pointing out that it is futile to expect a system to be operated and improved to meet the needs of a growing community without assuring safety of capital and an adequate return.

That the railways can do much to improve their own situation was indicated by the remarks on popularizing service. The cars on a property represent only some 15 to 20 per cent of the total investment. Yet frequently they are allowed to become a very unattractive feature. Since they are the salesroom of the company they should be kept in first-class condition. And this can be done at an actual saving in cost, it was pointed out.

But with all this, confidence in one's own property is essential. Unless railway men are sold on their own business they cannot hope to win the required support and confidence from the public that is so essential to success. These are the words of one of the most successful men in the utility field. Having gained this confidence and the support of the public, the rest is easy. Capital in sufficient quantity should flow in to care for all needed rejuvenation of the properties.

A New Viewpoint on Depreciation

DEPRECIATION is an operating expense, but its amount depends on the rate of destruction of property value. Hence its determination involves the consideration of many diverse elements. Usually the treatment of this subject has been from a rather narrow viewpoint, based on some theory which some writer is propounding. Such a method usually neglects fundamental factors, and occasionally leads to erroneous conclusions.

Since in the long run depreciation must be assessed against the car rider if service is to continue, it is essential that the burden be spread equitably. The many factors involved make it very difficult to charge the exact amount against each passenger, and in rate cases this has been a point for frequent argument. The amount of the charge is in general fairly large, being in many cases at least half as great as the return on the investment.

A wealth of information and an advanced viewpoint are contained in the series of articles by the late W. H. Maltbie now running in this paper. Probably the greatest authority on the subject, he treated it in a lucid manner that makes it easy of understanding and easy of presentation before public authorities. Seldom has a subject been treated with greater breadth and thoroughness.

These articles, which were completed shortly before Mr. Maltbie's death, serve as a fitting monument to a man who had won an outstanding position in the industry as a counsellor and a friend. His passing leaves a distinct vacancy which will be hard to fill.

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Dallas Permits Its Railway to Grow

DALLAS, TEX., is to have a 7-cent cash fare with a 6-cent ticket rate. The new rate is based on the recommendation of the supervisor of utilities to the Mayor and the City Commissioner after an exhaustive study of the situation. Except for some untoward circumstance the Dallas Railway could probably have gone on indefinitely on the old basis, but under the straight 6-cent fare it could not do the things it wanted to do and that it knew should be done to keep abreast of the growth of the city. Its margin of profit was too small to permit this.

It is an interesting story of public relations, this outcome at Dallas. The company laid its cards on the table last summer. The matter was discussed, but the disposition of the Mayor and the City Commissioners was to hold the company to strict accountability under the terms of its franchise contract, a modified service-at-cost grant. So far as the company is concerned this would have been the easiest way out for it, but its sense of public responsibility would not permit it meekly to accept such restrictions. So it renewed its request.

In return for a rate of fare which gives promise of doing more than merely permitting the company to exist, its officers have obligated themselves in no unmistakable terms. The railway and the city's supervisor of public utilities did all that was in their power to reach a basis workable from the standpoint of the railway and not unduly burdensome on the people of the city. If the railway had not been permitted to grow so as to meet its responsibilities the stigma would have rested upon the Mayor and the City Commissioners. Upward of $1,450,000 will now go back into the property. Surely 1 cent additional for each cash passenger is not much of a price to pay under the circumstances. As the Dallas *News* so aptly said, the grant of an increased fare, or rather the fractional increase in fare, "will enable the company to finance its needs, which are the needs of Dallas."

Planning Ahead of Present Needs

BURIED in the news items recently was a prediction made by Frank H. Alfred, president of the Père Marquette Railway, that the day was coming when trains would run over concrete roadbeds reinforced with steel trusses, and that cars would run on roller bearings, with a speed approaching that of airplanes. Considerable ingenuity would of course be required to overcome the mechanical difficulties presented in a proposal of this kind, but after all, the matter would probably resolve itself into the economic problem of whether such a project could be made to pay, and whether the time interval will become so important a factor in our lives. While at present it might appear that there is not likely to be a need for anything of this nature, who would have thought, only fifteen years ago, that the day was almost upon us when we would have, and really need, thousands of miles of pavement on our country thoroughfares? Even today these thoroughfares are becoming inadequate and the ingenuity of highway builders is taxed to find means of obtaining the maximum use of the right-of-way. To meet this demand super-highways are being developed in Detroit, and Chicago is now contemplating a similar plan.

Steam railroad development in late years, has not been in the matter of speed. Progress in that regard was pretty rapid during the latter half of the nineteenth century. It need only be recalled that engine number 999 made its record of 112.5 m.p.h. on the New York Central Railroad as early as 1893. Steam roads during the last quarter of a century have paid less attention to the matter of speed than to the better application of that speed. The improvements have been along the line of comfort, safety and increase of all-around efficiency. No one would like the idea of being whizzed along at 112 m.p.h. in 1893 type wooden cars.

If speed is needed, and needed for mass transportation, a development such as Mr. Alfred has suggested might conceivably be superior to airplanes because of its present advantage in the matter of having terminals located in the centers of cities, as it frequently requires a journey of an hour or more to reach an airplane field from the center of the city. No doubt there would be difficulties in the execution; but ideas like Mr. Alfred's are always in order. It is well to plan just a little ahead of the present needs.

P.R.T. Scores Once More with "Market Basket" Plan

PRICES may rise and prices may fall, but hereafter the Philadelphia Rapid Transit employee will go on his way, untroubled by such mundane considerations. This enviable state comes as a result of the "market basket" plan of wage adjustment which the men and company have just agreed upon. Two years of intensive research on the part of various committees of men and of employers' representatives have finally borne fruit in this agreement. Now the men will have the comforting assurance of a satisfactory standard of living, no matter what untoward economic crisis descends upon the country.

The plan also provides a stimulus toward increased operating efficiency among the employees, since they will share with the management in any surplus which may accrue over and above the dividend return on preferred stock. Points such as this would seem to indicate that Mitten Management has scored, as well as the men, in promoting a further spirit of mutual accord. A number of leading economists have given the terms of the agreement the stamp of their approval. From the theoretical standpoint it is par excellence—the last word in labor agreements.

Now it simply remains to determine how the mechanism of the plan will function in actual practice. The agreement provides that wage adjustments will be made once a year on the basis of an index figure determined by the cost of twelve typical market baskets, unless the fluctuation of the dollar's purchasing power exceeds 10 per cent for a period of three months or longer. As living costs take an upward trend the men will find more dollars in their pay envelopes. Conversely, as the cost of living decreases a corresponding reduction in pay will follow.

It is here that unusual care may well be exercised by the company, to make sure that the men do not feel they are being penalized. Two dollars less in pay a week is a very tangible thing. A reduction of two dollars in living costs is not so tangible. However, Mitten Management has been seeing eye to eye with its men for so long now in labor and wage-agreement matters that all such minor wrinkles will doubtless be ironed out without difficulty. A certain amount of educational work still remains to be done before the "market basket" plan has passed the test of time.

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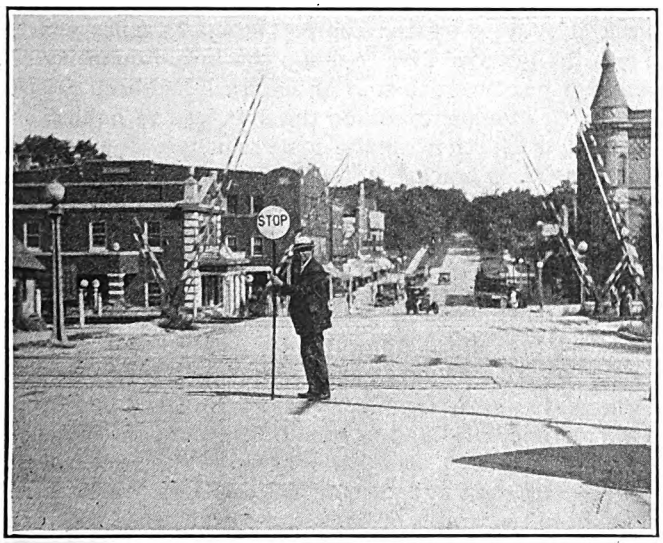
From Bankruptcy to Prosperity in Three Years

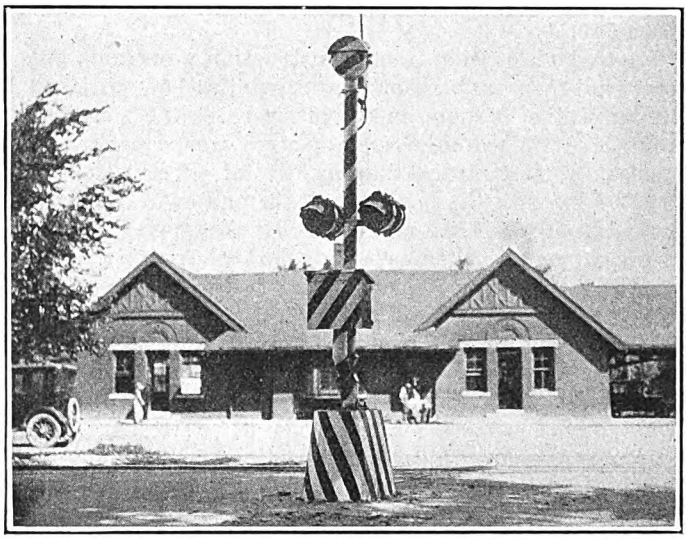
SECOND ARTICLE

Extensive Track Rehabilitation Program Carried Out by the Chicago, Aurora & Elgin Railroad—Substitution of Limestone for Gravel Ballast Has Reduced Maintenance Cost—Additional Crossing Protection Installed — Block Signals Protect Train Operation — Track Extensions Planned

IMMEDIATELY upon assuming control of the reorganized Chicago, Aurora & Elgin Railroad the new management inaugurated a comprehensive program for the rehabilitation of track. At that time the entire trackage of the system was ballasted with gravel, or gravel and cinders mixed. At the high speeds required to maintain schedules an excessive amount of track labor was needed, particularly in the fall, winter and spring months, to keep this track true to line and grade. Prior to the receivership the physical condition of the track had sunk to a low ebb. While considerable expenditures had been made by the receiver for the replacing of ties and the lining and surfacing of track, the result was far from satisfactory to the new management.



Method Formerly in General Use to Protect Grade Crossings on the Aurora-Elgin Line



Automatic Signals with Double Flashing Lights and Warning Bells Are Now Used at Many Locations

The first step was the ditching of the entire property with a steam ditcher, the material taken out being dumped upon the edges of fills, thereby increasing the factor of safety at these points. This served to drain the ballast and sub-grade, thus insuring a dry track. Through the cuts the ditches provide a place for snow removed from the track by plows.

For the ditching work a ⅝-cu.yd. Erie railroad ditcher was mounted on a flat car and coupled to a locomotive tender which supplied water and coal for the steam-driven ditching machine. Two 20-yd. air-operated dump cars were used to remove the material from one portion of the right-of-way and redistribute it at points where it was needed to increase the width of the shoulder. Over the 15 miles of right-of-way 25,000 cu.yd. of material was removed.

After careful examination it was found that the 80-lb. A. S. C. E. rail, some of which had been laid only ten years before, was in good condition and suitable for use for several years to come. This rail was in 60-ft. lengths with four-hole angle-bar joints. At the time of rehabilitation many of these joints were bent and some rail was badly worn under the head. Therefore, all joints in the sections of track which were rock-ballasted were replaced with four-hole continuous joints made by the Rail Joint Company. It was unnecessary to replace any of the rail on tangent tracks, except on the section between Laramie Avenue, Chicago, and Forest Park, over which the Chicago Rapid Transit Company has operated its elevated service for many years. This rail was entirely renewed with 101-lb. A. R. E. A. section, as was also most of the rail on curves.

Old ties were replaced with treated oak and white cedar ties, rail anchors being placed, eight to the rail length, opposite joints at centers and quarters of rails. These have eliminated the skewing of the ties at the joints and reduced the creeping of the rail with its subsequent bad effect upon track alignment.

Extensive trackwork was carried on between the hours of 8:30 a.m. and 4:30 p.m. due to the comparatively lighter schedule during this period of the day. To expedite the work three additional crossovers were laid, so that the average distance between crossovers would be 1½ miles. At the ends of each crossover a dispatcher's shanty was erected and the two booths connected by means of telephone. With these facilities

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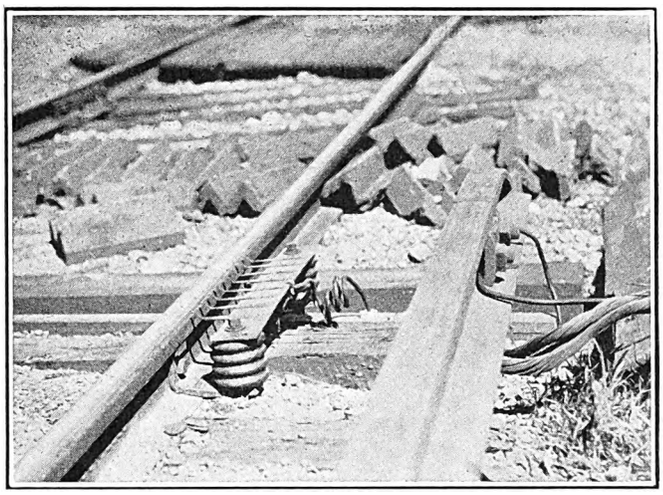
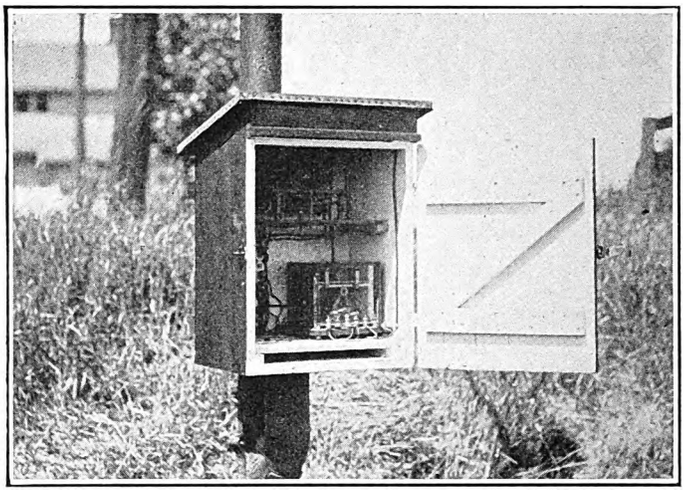


Contact on Running Rail for Operating Crossing Signals Is of the Progressive Finger Type



Cabinet on Pole Opposite Finger Contact Contains Relays and Mercury Tube Mechanism for Operating Flashing Signals

it was possible to handle all train movements in both directions over a single track without any delay. The total number of men used for this work varied from 75 to 110.

As a part of the track construction program, but somewhat separate from the rehabilitation work on the main line, sidings and yards were built at various points. At Wheaton a freight yard was constructed, consisting of six tracks having a total effective length of 3,366 ft. with the necessary leads and switches from the main line. This additional trackage was needed as a clearing yard for east-west carload freight, which constitutes a large portion of the freight business between Aurora, Elgin and Chicago.

In addition to the freight yards sidings were constructed both for passenger and freight service. At Elmhurst 640 ft. of additional track was built for two sidings having a total capacity of twelve cars. At Laramie Avenue, Chicago, five sidings having a total length of 1,830 ft. were constructed. This trackage was necessary in order to store passenger cars used in the short route service between Elmhurst and Wells Street Terminal, Chicago. Prior to the installation of these sidings, it was the practice to "deadhead" between Wheaton and Wells Street Terminal cars which were to be used in the evening rush hour. The sidings at Laramie eliminate all of this dead mileage and the increased car storage at Elmhurst allows for the installation of short-route service terminating at that town during the morning and evening rush hours.

Reballasting of the double track starting at the Des Plaines River and extending to Wheaton, a distance of 19 miles, was completed in the summer and fall of 1922. In 1925 the line from Wheaton to Elgin, a distance of 16 miles, was reballasted. First the track was skeletonized to the bottom of the tie and the material thus removed was used for widening the shoulders. With portions of the track in this condition, it was possible to scrutinize the ties and replace those which would not last for two years. This resulted in the renewal of an average of 900 ties per single-track mile.

Reballasting was done with limestone ballast in sizes 1 in. to 3 in., placed under and around the ties to the extent of 0.4 cu.yd. per foot of single track. After a length of track had been skeletonized, the first dump of new stone was made on one track, this dump being sufficient to raise the grade of the track 6 in. and do the tamping. On this first dump, 0.25 cu.yd. per single-track foot was deposited. During reconstruction and ballasting, single-track operation was put into effect between crossovers located approximately 1½ miles apart. It was the practice first to dump the initial quantity of ballast on one track, then after the track had been raised and the ties tamped to dump the first load of ballast on the other track following the same sequence of operation as on the first track. After the two tracks had been raised sufficiently to insure at least 6 in. of stone ballast under the ties, in addition to the old foundation of gravel ballast which remained undisturbed, the finished dump of rock ballast was made which brought the ballasting up to the top surface of the tie and completed the shoulder at the tie and the fill in the devil strip.

Rodgers center dump ballast cars were used for this work, while the tie tamping was accomplished by means of three Ingersoll-Rand pneumatic tie tampers of four-tool capacity each. The distribution of the rock ballast was accomplished by means of sixteen cars, which were operated in two trains of eight cars each. The limestone was secured from a quarry along the railroad right-of-way. It was the practice to take three trains of ballast per day from the quarry to the point on the right-of-way where the ballasting was being done. One motor car was used for this work, one train being filled at the quarry while the other was being delivered to the point of application.

Signals and Crossing Protection Installed

Extensive development of crossing protection and signal devices took place during the rehabilitation period, with the result that crossing accidents have been reduced to a minimum. A definite method of deciding when, where and how crossing protection should be installed was inaugurated and a standard form of crossing sign and signal have been adopted. A committee made up of five men determines the type and location of crossing signals and signs. From the committee's recommendation, the question of automatic protection or a watchman is decided. The type of protection depends upon the traffic at the crossing.

Where the majority of the traffic is pedestrian an automatic signal is installed, while at crossings where teams and automobiles are in the majority flashing red lights—in a few locations watchmen—are employed. The center installation consists of a single standard on

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Depreciation as an Operating Expense

SECOND ARTICLE

Determination of the Reserve—Replacement vs. Retirement as the Basis of Calculating Charges—Comparison of Separate Funds for Various Elements with a General Fund — What Is Average Life?

By W. H. Maltbie
Late General Counsel United Railways & Electric Company of Baltimore

SOME months ago, as the result of a conversation with one of the editors of this paper, the author undertook to prepare a series of articles on the subject of depreciation. This series was looked forward to with great interest, as Mr. Maltbie was an outstanding authority on the subjects of valuation and depreciation. After his death, the manuscript was located and forwarded to this paper through the kindness of J. H. Hanna, chairman of the A.E.R.A. committee on national relations sub-committee on depreciation, of which Mr. Maltbie was a member.

These articles were written from the viewpoint of the present investigation by the Interstate Commerce Commission of the whole subject of depreciation of electric railway property. This investigation was undertaken with a view to establishing definite rules and regulations covering the allowance of charges for depreciation as an operating expense on all roads subject to its jurisdiction. Since there is a possibility that any regulations of this sort established by the I. C. C. may be accepted as a precedent by various state commissions it is important that all street railway executives should be familiar with the present situation.

These three articles, dealing respectively with causes of depreciation, methods of setting up funds to provide for depreciation and practical methods of building up a retirement reserve, constitute a valuable contribution to the literature on the subject. They were probably the last creative work of the author.—EDITOR.

THE second point to be considered in the problem of depreciation is the question as to how large the reserve shall be, and the answer to the question depends upon the purpose for which the reserve is accumulated.

Students of the subject are divided into two schools. The first school holds that the reserve is intended merely to refund to the investor the amount of his investment when the property is outworn. If the replacing property costs more, the investor is supposed to furnish more capital; if it costs less, he has free capital which he may withdraw from the investment. The other school holds that the sum to be accumulated should be sufficient to purchase a duplicate unit of equipment. The first school maintains the investment, the second school maintains the plant. The first school builds a retirement reserve, the second a replacement reserve. The first school, knowing the cost of the unit of property, must estimate the amount of salvage which can be secured at the time of its retirement. The second school must estimate not only the amount of probable salvage but also the probable cost of replacement. It is evident, therefore, that while neither school can be positive as to the definite figure which must be accumulated in the reserve, the estimate for a replacement reserve is of necessity less definite than that for a retirement reserve.

The estimated value of salvage is usually but a small proportion of the total cost of the unit of property and therefore an error in this is not of vital importance. It is true that during the World War value recovered for salvage was frequently much greater than had been anticipated and in some cases greater than the total original cost of the property retired. But this variation yielded an excess sum, and therefore did not create any financial embarrassment.

For the replacement reserve, however, it is necessary to estimate in advance the cost of the new replacing unit of property. For short life property in a period when economic conditions have brought about a well-defined unit cost trend such a prophecy may be reasonably accurate, but for long life property, or for all properties in periods of rapid economic change, such prophecies are practically worthless, and the amount of the depreciation reserve must be changed frequently, or even from year to year as the replacement cost changes. Consider, for example, a single unit of property whose replacement cost has followed the index number for metals and metal products of the United States Bureau of Labor statistics. Assume an investment made Jan. 1, 1913, in entirely depreciable property, of $100,000, with a 20-year life. Then in the accumulation of a retirement reserve there will be a charge against operation of $5,000 per year. If it is desired, however, to accumulate a replacement reserve, the amount which should be in the reserve fluctuates in accordance with the following table:

Year	Index	Proper Reserve	Necessary Contribution
1913	100	$5,000	$5,000
1914	85	8,500	3,500
1915	99	14,850	6,350
1916	162	32,400	17,500
1917	231	57,750	25,350

It is obvious that it is not possible to plan practically for a reserve which must meet such sharp variations.

If, however, we are dealing not with a single unit of property, but with a large aggregate of units of different classes and types, it is possible to meet this objection against the replacement reserve.

The amount of the reserve is affected somewhat by the anticipated reason for the retirement of the prop-

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erty, since this reason may have a direct effect upon the salvage value to be recovered. Thus a company engaged entirely in interurban service may anticipate the retirement of cars on account of their inadequate carrying capacity, and consequently give them a short life with a relatively high salvage value as the amount to be realized on resale, while a company doing a more diversified business would plan to shift these cars from an interurban branch to urban service if they became inadequate for interurban service, and would consequently make no allowance for salvage other than scrap or junk value.

Length of Future Life

It is not sufficient, however, to know merely the total reserve which should be accumulated by the time the equipment is to be retired. It is necessary to know the annual appropriation to the reserve. This demands knowledge at the beginning as to the number of years during which the unit of property will be in service.

It is obvious, first of all, that there is no possible way of determining with any certainty the future life of an individual unit of property, and that any estimate made must be in many cases nothing more than a guess.

For the owner of a single piece of equipment, such, for example, as a single car, this problem of determining the future life of the car is of vital importance. He must estimate its life before it wears out, which, assuming proper maintenance, will be a long term of years. He must also estimate the length of time until it becomes obsolete, which will probably be a shorter term, and he must also estimate the length of time until it becomes inadequate, which may be a still shorter term. Then, if he wishes to play safe, he must adopt as his life period the shortest one of the three. Moreover, since he is dealing with a single unit, he is not helped particularly by any knowledge of average life. If, for example, he knew that in the past history of the property with which he was connected the average life until inadequacy had been ten years, and he therefore estimates ten years as the life of the one unit with which he is now dealing, he is simply taking even chances on losing money, since there will be as many instances of inadequacy below the average as above. His only safe method is to use the minimum life term and not the average. In other words, if an executive is dealing with a single unit and desires to play safe he should accumulate its retirement cost in the minimum life which can be reasonably anticipated, and even then he is taking his chances against retirement through non-insurable accidents within a still shorter period.

Unit, Class or General Reserve?

When, however, we cease to deal with a single unit and deal with an aggregate of units, either all of the same class, or of different classes, a number of new problems arise.

The first and most important question to settle is whether we will set up a reserve for each individual unit of property, a reserve for all units of a given class or a general reserve to be used for retirements of any property belonging to the company.

If we decide to set up a reserve for each unit of property then the appropriation to that reserve must stop whenever the unit is retired from service, or, if it should overlive its estimated life, at the expiration of the estimated life. The result of this system is a deficit on short-lived property which must be charged to operation or to surplus. If it were possible to charge it to operation, the result would be that the users of that particular year would pay not only their share of the original cost of the article, but also the deficit in the payments of the users of the preceding years, and therefore one of the primary objects of the accumulation of a depreciation reserve, the equalization of cost to users of successive years, is destroyed. Moreover, it is practically impossible to charge this deficit against operation because rates of fare cannot be raised and lowered on account of unexpected retirements. The consequence is that the actual cost is charged against the owner of the property, either by being charged against his accumulated surplus or by increasing operating expense and decreasing his return for the year in question. In consequence the owner loses the protection which the accumulation of the reserve was designed to give him, namely, the protection of his right to collect from the users of his service not only the cost of operating but the cost of the equipment worn out in service.

Nor has the owner any chance to recoup this loss, for while the number of years of life beyond the average may equal the number of years of life less than the average, the reserve for the individual unit cannot justly receive any appropriation after it contains the full retirement cost. Therefore there can be no appropriation to any unit reserve in excess of the original cost of the unit, and therefore nothing wherewith to balance the owner's loss on the short-lived unit. To make the matter more specific, assume that two cars are purchased and given an estimated life of 20 years, and that one of them lasts for eighteen and the other for 22 years. Assume, moreover, that the depreciable value of the cars is $10,000 each, so that the annual appropriation for depreciation is $500. When the first car goes out of service at the end of eighteen years there will only be $9,000 in its reserve. No more can be charged in its reserve, because it is no longer in existence. The $1,000 must therefore be charged either in its last year, which is impossible, since rates cannot be changed, or must be charged against the owner and taken as a loss. At the end of the twentieth year the second car will have the full $10,000 in its reserve and no more can be charged against it. If rates are adjusted so as to pay only the depreciation appropriation and a fair return, the users of this car in the 21st and 22d years are having a part of their service paid for by the users who contributed the deficit in the eighteenth year. If, on the other hand, the rates are left unchanged both in the eighteenth and 21st and 22d years, the owner has a chance in the 21st and 22d years to recoup the thousand-dollar loss incurred in the eighteenth year, but it will come to him not as a recognized recoupment, but as an apparent excess over a fair return, and, if of sufficient magnitude, may lead to a public demand for reduction of charges.

So long as an individual reserve is set up for each unit of equipment or other property it is evident that the owner must protect himself by using, as in the case of the owner who owns a single unit, a minimum rather than any average life. If, however, the reserve is set up for groups of units, conditions change. Consider, for example, the case of a road having just purchased a lot of 100 cars of the same model. If instead of setting up 100 separate reserves, one for each car, a

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single reserve is set up for the 100 cars, it is possible, so far as the influence of wear and non-insurable accident is concerned, to use an average figure, realizing that the longer-lived units of equipment will make good any deficits created by the passing out of the short-lived units. But, so far as obsolescence and inadequacy is concerned, these cars, if they go out at all, will go out together, and therefore the minimum life period must be adopted in order to protect the owner against these dangers. If, however, as is frequently the case, this company owns not only these cars but many others of other designs and models, and carries a single reserve for its rolling stock, there is less danger of it all going out at one time through either obsolescence or inadequacy, and average figures may be used with the expectation that those patterns or models which exceed the average life will make good the deficits created by those which do not reach the average.

If we go a step farther and set up a single reserve for the entire property, it becomes possible to minimize still further the influence of obsolescence and inadequacy on our life periods. If our cars become obsolete earlier than we anticipate there is a chance that our power plant, our boilers, our substation equipment will exceed our estimated life.

The whole situation seems to boil down to this: There will always be cases in which individual units go out earlier than is anticipated. If a reserve is created for the individual unit, this means a loss, but if a reserve is created for a group, the broader and more diversified the members of that group, the better chance there is of recouping through excess life the deficits created by short life.

Average Lives

But this possibility of extending the life term rests upon our ability to determine an average life, and doing business on a basis of averages is extremely dangerous unless certain fundamental scientific principles are strictly observed.

The first of these is that the averages used must be deduced from a sufficiently large number of definitely reported instances to eliminate the influence of individual cases or even the influence of sub-groups. If you were trying, for example, to determine for the first time the average human life, there would be no better way than to record the age at death of all reported deaths. The average at the end of the first ten entries may be anything from two or three years up to eighty or more. The tenth entry may make a marked change in your average, the hundredth entry a much smaller one, the thousandth entry, by itself, would not make any appreciable change in the average, but you may at this point run into the deaths of a different group or a different community, or the results of some accident or epidemic, and find an appreciable change. You finally reach, however, a point where your average is practically unchanged, whether you add a single entry, or a thousand, or a million. Whenever this point of sound average is reached, it is safe to use it as the basis of financial transactions, provided the second fundamental principle is observed.

The second fundamental principle is that financial transactions may not be based upon the sound average deduced as above unless it is applied to a group large enough to yield of itself a sound average. Thus if the study of a million cases leads to an average life expectancy of 30 years, it is not safe, therefore, to insure a single individual, or ten individuals, or a hundred individuals upon that basis; but an examination of the data will show that it is possible to determine a smaller group, which selected at random from the larger group will yield approximately the same average. An insurance company will then plan its business with a view of spreading its risk over the number of lives, as a minimum, in this smaller group and over sufficient territory to bring into play all of the occupations and conditions which entered into the original estimate (unless, of course, it attempts to eliminate some of those which tend to shorten life).

Now, unfortunately, neither of these conditions can be met in studying the life of electric railway property. Retirements and ages at retirement have not been recorded, so that there exists no sound average life on which to base financial transactions, and therefore the first cannot now be met.

Determination of Useful Average Life Hopeless

The hope of some time determining definite life tables upon which general depreciation ratios may be set up, although still held by theoretical students of the question, receives but little encouragement from practical men in the street railway industry. The American Electric Railway Engineering Association attempted the problem in 1911, but after careful study pronounced it hopeless, and abandoned it, and a joint committee of the Engineering and Accounting Associations reached the same conclusion and requested to be excused from further consideration of the subject in 1925.

The reasons for this conclusion are comparatively simple and are perhaps best understood by considering special illustrations. Consider track. The life of the tie is a question of decay and not at all a question of amount of use. Decay itself is a question of the quality of the original tie and of the character of the base in which it is imbedded. The latter varies from property to property and from point to point on the same property. The former varies from property to property and from tie to tie on the same property. The life of the rail is almost entirely a question of wear, complicated in some cases by corrosion of the rail base. The amount of wear is a question not of years, but of car movements and, in the case of rail in paved streets, of other vehicular movement as well. Car movements vary from point to point upon the same property and change from year to year at the same point with the readjustment of traffic in a way that cannot be definitely predicted. Other vehicular movement cannot be predicted at all, and the gradual disappearance of the iron-tired vehicle from city streets and to a certain extent the modern bonding of track probably vitiate the entire previous experience.

The life of a car is a question of maintenance, not only of the car itself, but of the track over which it runs, of the weather conditions under which it operates and of the extent to which its motors are subjected to overload, while obsolescence, which no man can predict with any certainty, and inadequacy, which is a purely local phenomenon, equally uncertain, are probably much more important than mere wear.

But even if the data were available and the sound average had been computed, it could not be applied to the property of any particular company, since the number of units operated by that company will be relatively small and all of them subject to the same set of local conditions which modify service life and which

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have been eliminated or minimized in the sound average. If, for example, the data were available, were collected and digested, and showed a sound average life for rolling stock of 25 years, that information would not form a satisfactory basis for a depreciation reserve for company A, which recently wrote me that in its judgment every car became obsolete after fifteen years of service and should be retired, or for company B, which wrote me that it was rebuilding cars already in operation for over 20 years and anticipated drawing from 20 to 25 years additional service out of them before they were again put through the rebuilding process.

The life of any particular unit of equipment is, as noted above, in greater or less degree a function of climatic condition, of the amount of use, of the standard of maintenance, of changes in the art and of the amount and character of community development. All of these differ from location to location and company to company. A sound average can only be found by the equalization of these differences, but a figure can be applicable to a single company only provided it does not equalize these differences. On the other hand, each of these elements, excepting possibly climatic conditions, changes from decade to decade for an individual company, and therefore the experience of the individual company, in addition to covering too small a number of illustrations, is, by the possibility of a change in the very elements which determine the length of life, made an unsafe basis for financial transactions.

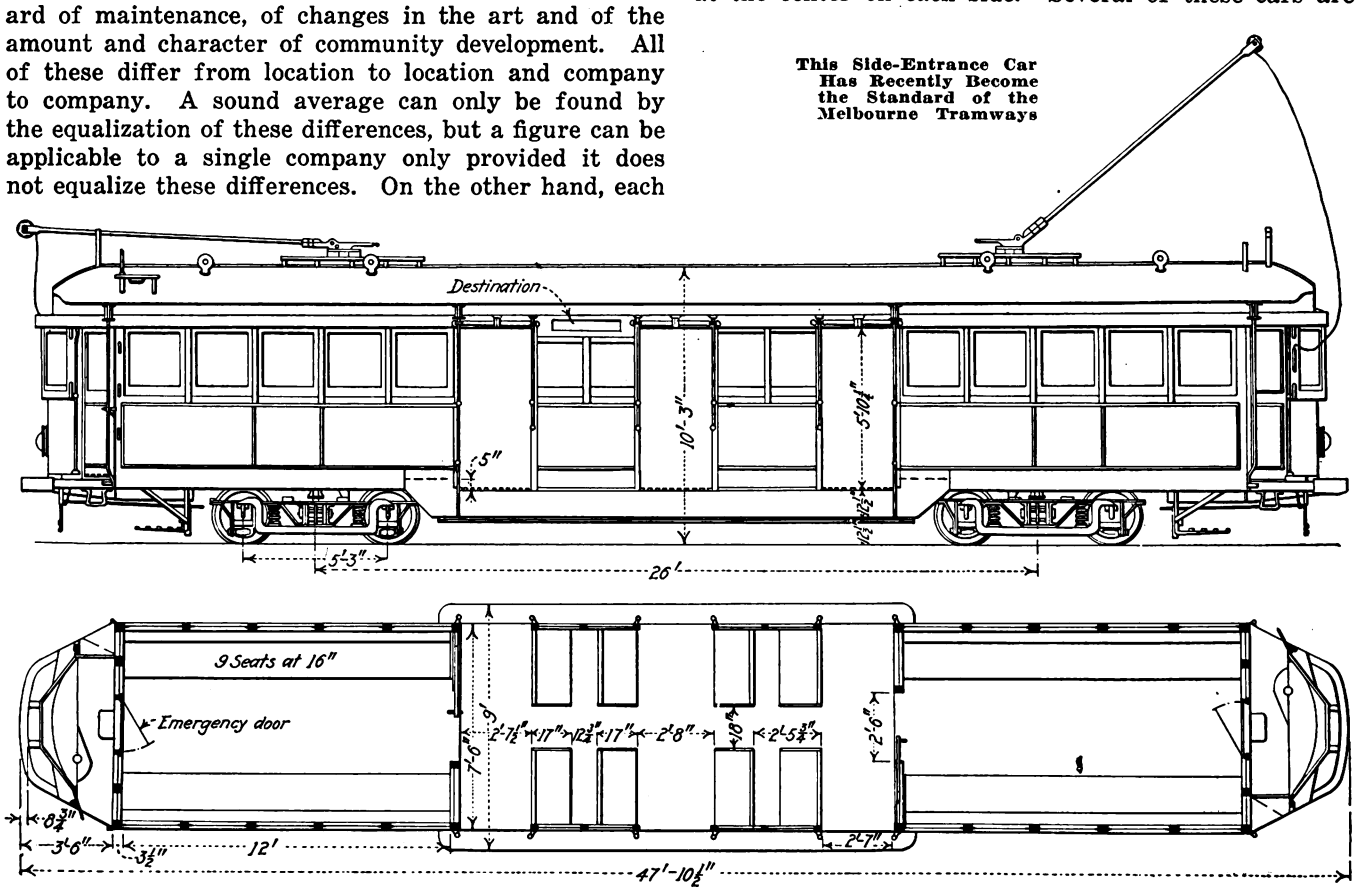
New Promotion System in Vogue in Los Angeles

EXAMINATION of the 114 men who were tentatively appointed as line instructors under the new promotion system of the Los Angeles Railway, Los Angeles, Cal., was conducted recently by Dan Healy, chief instructor. The examination covered the general rules for motormen and conductors which were compiled and given to the instructors in printed form on Nov. 1. They were given 30 days to study the points that must be drilled into the minds of new men. About 40 men were called into the instruction department at a time. The examination was conducted orally by Mr. Healy, and time was allowed for discussion of points on which there was a difference of opinion. Mr. Healy said he was highly pleased with the way the line instructors have learned the essential points of their work and predicted that very few would fall down on the examination.

Melbourne Adopts Three-Door Car as Standard

MULTI-SIDE DOOR cross-bench cars are no longer standard on the Melbourne Tramways. It has adopted a center entrance and exit car with three doors at the center on each side. Several of these cars are now in service and have proved satisfactory. A feature of the car is that the side entrances are not equipped with doors. The mild climate of Melbourne in winter makes it unnecessary for protection against the weather, and the experience with these cars indicates that doors were not necessary to prevent accidents in boarding and alighting.

This Side-Entrance Car Has Recently Become the Standard of the Melbourne Tramways



There are, however, bulkhead doors at the entrance to the end compartment, which seat eight on each side or sixteen to the compartment. The total seating capacity of the car is 52. The car is equipped with 26-in. wheels and four motors, one on each axle. The weight of the car empty is 17.11 tons.

A number of the main dimensions of the car are shown in the accompanying drawing, which is from the *Electrical Engineer of Australia and New Zealand.*

The electric railway system in Melbourne consists of about 160 single-track miles, covering about 90 route-miles. About 27 single-track miles will be added during the next twelve months.

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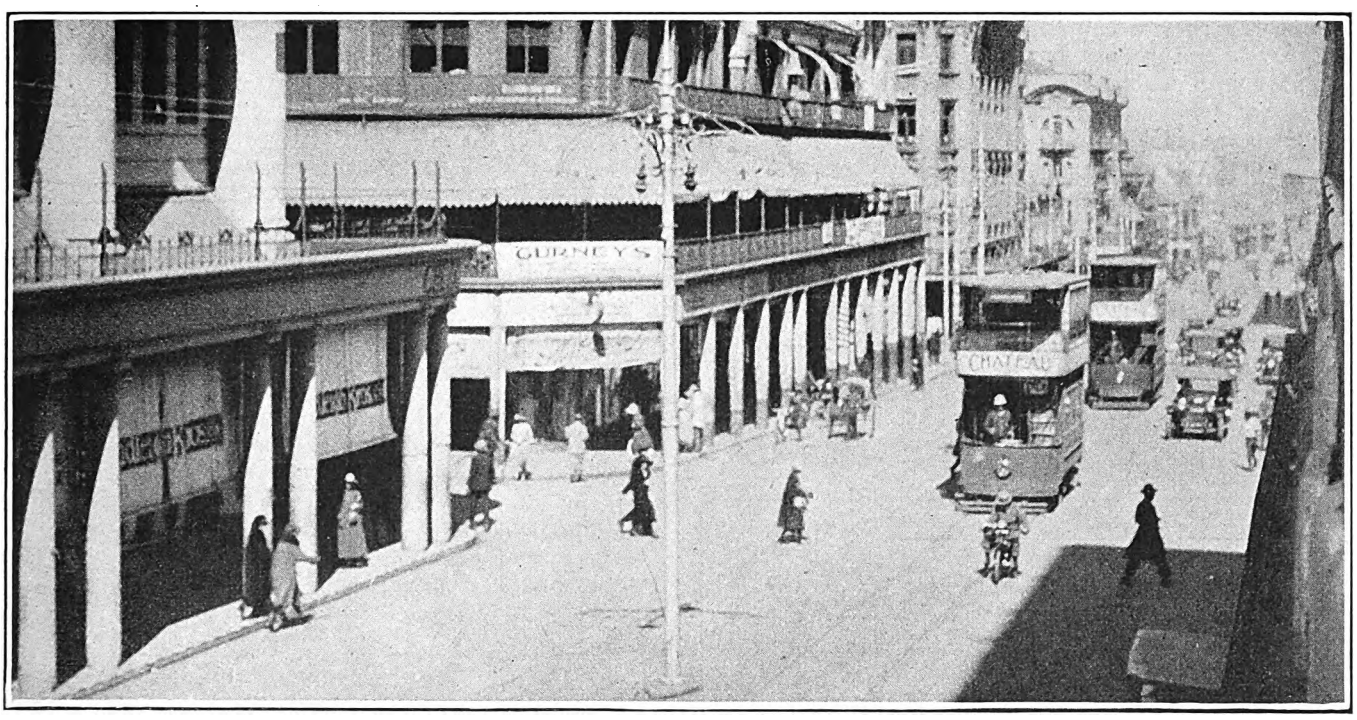

Double-Deck Tramcars in the Shopping District of Johannesburg. The Center Poles Shown Have Now Been Removed

Tramway Operation Progressive in the Witwatersrand

Johannesburg Has Double-Deck Car Bodies on American Underframes—Schedule Speed Is High—Competition of Privately Owned Buses Has Been Serious, but Is Now Being Met by Operation of Tramway-Owned Buses

By M. Edward

JOHANNESBURG, the central city of the Witwatersrand, has what is claimed to be the largest electric railway system operating double-deck cars in the Southern Hemisphere. The whole of the Witwatersrand, that famous 60-mile strip of gold-bearing reef in the Transvaal, has proved itself the most progressive part of the Union of South Africa, particularly in the mechanical field. Johannesburg has a black and white population of about 300,000 in a municipal area with a 6-mile radius. As the cars are only run for the benefit of the white population, the system caters to approximately 160,000 people in a comparatively large area.

Substitution of electricity for horse power was begun in 1906, the municipality buying out the company then operating the horse cars. Politics has not played much part in the management of the system, which is vested in a committee that operates it on entirely business lines. Most of the street cars in South African cities are operated by the municipalities, the exceptions being in Cape Town, Port Elizabeth and Kimberley. These company-operated tramways are not as large as the Johannesburg municipal system. There is a trend in South Africa toward state and municipal ownership of large public enterprises. For instance, the railways are owned and operated by the government, as are the telephones and telegraphs, and in practically every city and town the power stations are municipal property.

Power-generating facilities in Johannesburg are also municipally owned. In the operation of the street cars only the actual cost of electricity supplied is charged against them, no overhead being included.

From the beginning double-deck cars have been used in Johannesburg, the system being modeled on the English plan. Originally the city of Glasgow, which is famous throughout the British Empire for its tramways, was looked to for guidance. Now, however, a system peculiar to the needs of Johannesburg has evolved. More than 90 per cent of the 135 English-built cars brought out in the first few years are still in operation. The first bodies were built in Great Britain and only assembled in South Africa. Today it is the practice to build the bodies locally and large shops have been constructed for this purpose. During the past few years more than 60 American double-truck underframes have been bought from the J. G. Brill Company and extraordinarily good-looking 75-80-passenger double-deck bodies have been built on them in Johannesburg. Most of these cars are equipped with four 50-hp. motors, while some have four 35-hp. motors. Of the English-built cars only twenty are of the double-truck or "bogie" type, but even the original small four-wheel double-decker can seat more than 60 passengers and has given excellent service in spite of consistent overloading.

Single-deck cars are by no means rare in South

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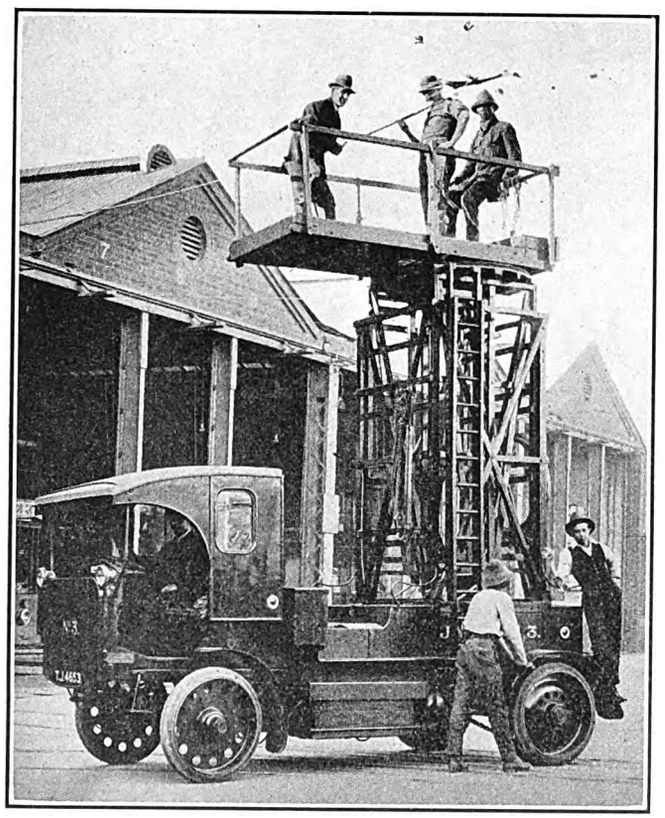
Africa, as they are used in Kimberley and Pretoria exclusively and in Cape Town and Port Elizabeth in conjunction with double-deckers. It was only in 1925, however, that Johannesburg citizens first saw a single-deck car on their tracks. The double-deck cars have proved satisfactory for city and suburban traffic in Johannesburg, but the tramway committee has now decided to try out a number of small four-wheel single-deckers, the bodies being built locally on some of the original underframes first brought out for use as double-deckers. These small cars seat only about 30 passengers and they are used mostly during the slack periods of the day. It is said that they are proving successful and are saving power when small loads are to be handled.

When the traffic is heavy the double-deckers are used, supplemented by single-deck cars run alternately with



Electric Tower Truck of the Johannesburg Municipal Tramways. Gasoline Trucks Also Are Used

them. This is practically a "car-and-a-half" system and its use is said to be due to the competition of privately owned motor buses, which have assailed the Municipal Tramways in practically every section. More than 50 miles of route are operated by the tramways and the total trackage is 80 miles. This is being extended, but it is thought that the 100-mile mark will hardly be reached in view of the change of policy necessitated by the motor bus competition.

FIGHTING PRIVATELY OWNED LINES

A bitter war has been in progress during the past three years and it now appears to be reaching its final stages. The municipality had it in its power, of course, seriously to hamper privately operated motor buses, but public opinion was too strong and consequently the war was waged with perhaps more restraint than had the cars been owned by a company. As far back as 1912 petrol-electric buses were used as feeders by the Municipal Tramways, but they were discontinued when further sections of track had been laid. The manager of the tramways has long advocated buses as being necessary to co-operate with the street cars, and at last it looks as if this is to be done. The bus companies won an important lawsuit in their protest against municipal regulations that sought to tie them down to certain streets, and it now seems almost certain that municipal buses will be put into operation to assist the street cars in the fight. It is asserted that the use of these municipal buses will be continued instead of the laying of further track.

An interesting fact in connection with the buses is that they are all single-deckers and it does not seem likely that double-deck vehicles will be put on the streets as they are claimed to be unsuitable for the type of traffic to be handled. Yet the operation of double-deck street cars has been entirely successful; a paradoxical state of affairs which can hardly be explained. The double-deck street cars are liked by the public and it has been almost as difficult a task to introduce the new single-deckers as to introduce double-deck rail vehicles in New York. It seems to be a case of what the public is used to.

In America there seems to be an impression that double-deck street cars are necessarily slow. This idea has probably become fixed for two reasons. In England the street car systems are undoubtedly less speedy than in America, and as the cars are mostly double-deckers the reason for slowness has been placed there. The other reason is that the passenger upstairs is inclined to imagine that the car is traveling more slowly because of the distance from the ground. In view of the prevalence of the idea that double-deckers are almost always slow and cumbersome, it is interesting to note that the Johannesburg system is as speedy as the average city and suburban system in America.

On the whole system an average speed of more than 10 m.p.h. is maintained. This is fast when the number of stops and the density of city traffic is taken into consideration. Although traffic is naturally not as dense as in large American cities, it is of a mixed character that makes it peculiarly difficult. Everything from ox wagons and rickshas to automobiles and motor trucks is met with and tie-ups are frequent in spite of good police supervision.

Routing has been planned to serve to the best advantage both the city and suburban travel. In most cases the ordinary city-type track has been laid in the center of the town, changing to sleeper track about 2 to 3 miles out. In one or two instances, however, it has been found possible to change to sleeper track laid at the side of the road within ¾ mile of the central terminus. This central terminus is right in the heart of the city next to the city hall, and ample space is provided for a number of tracks and for turning cars not scheduled on straight-through runs. While most cars now stop and turn at the terminus, some go through to other suburbs, and this practice is to be continued and extended.

About 60 suburbs are served, some of them 6 miles and more from the center of the city. On the eastward and westward routes, along the gold-bearing reef, the cars run in competition with the government railways and good speed has to be made. The question of stopping places in the city has always been a difficult one owing to vested interests, and until quite recently many attempts to reduce the number were frustrated. Now, however, most city stops are a distance of two or three blocks apart, the blocks being small and the total distance from signal to signal around 120 yd. Imme-

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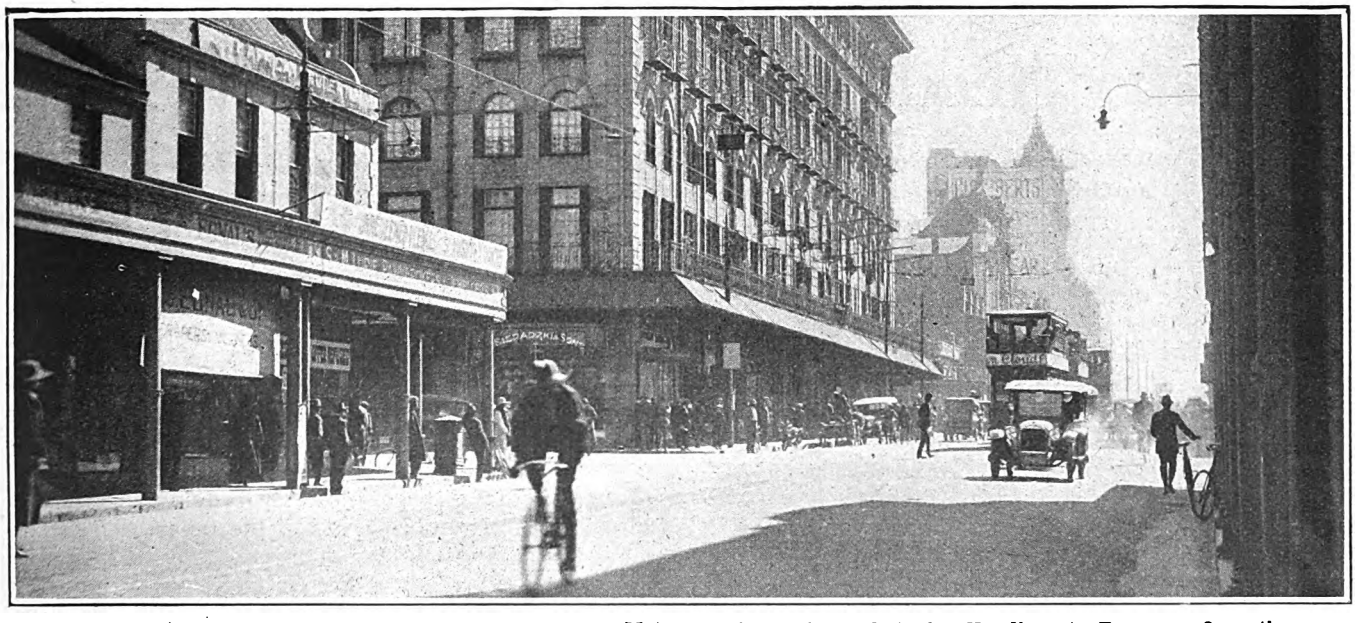
diately the cars get outside the city limits the stops get less frequent, distances of 240 yd. being quite usual.

Even the oldest cars have been kept in excellent condition and can accelerate rapidly. They are equipped only with hand brakes, however, with magnetic rail clamps for emergency. All the new vehicles have air brakes and attempts will be made to equip the entire 200 passenger cars with Westinghouse brakes in the near future. On no cars are the motormen protected by glass screens. This is done at the request of the men that they go unshielded. In 1920 a glass-screened car was put into service, but the motormen said they found it too warm. Really cold weather and long rains are infrequent in Johannesburg, and the question of protection for motormen has been finally dropped. All the cars have tops over the top decks, however, and the new types provide glass side protection for passengers up as well as down stairs.

Speed of the slowest cars is between 18 and 20 m.p.h. on the level, while the latest can do up to 25, developing more on long runs. Speed is well maintained by good distribution of power and there is no perceptible slowing down over distant sections. The power is boosted on some of the many long hills. New cars travel up the mile-long 8½ per cent grade of the Zoo hill at 16 m.p.h. The track is so well laid here that speeds of 30 m.p.h. are made on the down grade, with compulsory stops for brake-testing purposes. Operation on this hill is typical of that on many other long and steep grades in the suburbs. In the twenty years of electric car operation in Johannesburg the system has earned a name for safety as well as speed, for fatal accidents have been few. Only two cars have turned over in all this time, and only one of these accidents was attended with a fatal result to a passenger. While motormen are allowed to speed their cars on long, straight stretches where the track is on the side of the road and does not interfere with other traffic, great care is taken at crossings, points and curves, and derailments have thus been brought to a minimum.

Few cities are as dependent on their street car systems as Johannesburg. The railroad serves only a few suburbs on the east and west and the buses serve only one or two districts not touched by the cars. The citizens have got the "home-to-lunch" habit strongly developed and it is only residents of the far-away suburbs who stay in the city between 1 p.m. and 2 p.m. To meet this desire the tramway department operates an excellent express car system from about 12.45 p.m. on all lines to distances of 4 miles. The cars used for expresses are the latest ones with American chassis and some runs worth mentioning are made. From the Town Hall to Parkview is four miles and the busy luncher can rely on getting there at best in twelve minutes or at worst in fifteen. The ordinary time is 22½ minutes. From the Town Hall to Melville is 3½ miles and express car time is thirteen minutes. The luncher can be sure of getting to his home and back to his work at an average speed of between 15 and 20 m.p.h. So good are the expresses that many a citizen uses a street car instead of his automobile for his lunchtime excursion. It is by service such as this that the trams have become popular in Johannesburg, and although a large section of the public went to buses as something new, thinking that it would get service that was even faster, the wave is now on the turn and the street cars are more than holding their own. The buses, while faster at first because they had fewer stops to make until they became popular, are now very little speedier than the street cars and have to take chances in the way of speed in traffic to maintain any superiority. Moreover, they are not so reliable as the cars.



Mixed Traffic, Including Everything from Oxcarts to Motor Trucks, Is Somewhat of a Handicap to Tramway Operation

The most infrequent schedule on which cars are operated to the less populous suburbs is 22½ minutes, with specials in between during rush hours. On some lines, however, the public has what amounts to a two-minute service and suburbs at a moderate distance have cars every 7½ or fifteen minutes. The privately owned buses have not been able to maintain this frequent headway. The losses due to bus competition have not been in any way more severe than has been the case where wars have been waged in American cities, and the street cars in Johannesburg, after about eighteen months of loss, have started to show substantial profits. The service has always been considered a profitable one and the operating figures indicate that it is economically managed. Revenue averages between $200,000 and $250,000 per month, a small amount of this being obtained through advertising spaces sold inside and outside the cars. An average of about 90 cars is

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operated during slack hours and 140 and more during rush hours. Passengers carried monthly average between 3,800,000 and 4,000,000, so that it will be realized the cars work a great part of the day. Earnings average about 5 cents per passenger, although there is no flat rate, the zone system being used.

The zones are 2d. (4 cents) cash, a zone being an average length of a mile for the near suburbs and 1½ miles for long-distance runs. For instance, it is possible to travel from the central terminus to Rosebank, a distance of more than 6 miles, for 16 cents cash, with a reduction of 33⅓ per cent for coupon holders. Coupons are printed in books of eighteen for 48 cents, and consequently the coupon-holding number of passengers is large. Cash fares are in the minority. It has been found better in practice to charge comparatively high cash fares and the lowest possible rates for regular travelers. It is thus possible to travel about 6 miles for a fraction over 10 cents. Receipts average around 42 cents per car-mile and costs about 40 cents.

Various tickets have been used from time to time, in practice the colored system having proved out well. The conductors punch the tickets with the usual small registering collectors and they have to keep logs as well. The bottom portion of the coupons is detached by the conductor and the coupon is punched with ordinary clippers. The zone system presents a few more difficulties in organization and fare collection than the flat rate and there is talk of trying out the latter in the near future. The zone fares have worked so well, however, that it would hardly seem advisable to rule them out.

The Johannesburg Tramway system cannot be called interurban, but the cars connect up with the systems of buses and trackless trams of adoining municipalities. The last direct contact with trackless cars went a few years ago when Germiston gave up this system for buses. It is possible to travel from Johannesburg to Springs on the East Rand, a distance of 30 miles, by street car, bus and trackless car, although the train is always used for through journeys.

Industry Needs Merchandising Viewpoint

First Sectional Conference of the Advisory Council, Held in Chicago, Develops an Optimistic View of the Electric Railway Situation—Leaders Demand Confidence and Courage—Need for Improved Cars Emphasized

"THERE is a growing feeling that the clouds on the electric railway horizon are being rapidly dispelled by renewed confidence and initiative on the part of its leaders."

B. C. Cobb, chairman of the Advisory Council of the American Electric Railway Association, sounded this note of optimism in opening the first "owner-manager" sectional conference, held in Chicago on Feb. 24 and 25. Approximately 100 railway executives representing properties throughout the Central territory met at the invitation of Managing Director Storrs for a frank discussion of some of the basic factors in the electric railway situation. There was no formal program. The plan for the meeting as arranged by Mr. Storrs was simply to give an opportunity for those who are endeavoring to foresee the destiny of the industry to analyze current tendencies and to exchange ideas.

Taking the needs of the industry as his theme, Samuel Insull called for renewed courage on the part of its leaders. "The crying need of the electric railways is capital," he said. "Unless a utility has the confidence of the public, its securities are not a good investment. Confidence is the backbone of good public relations." But he added that the first step in the rejuvenation of the electric railway industry is to build confidence in their own industry on the part of railway executives and employees. "Unless railway men are 'sold' on their own business," he maintained, "they cannot hope to win the required support and confidence from the public that are so essential to success."

Mr. Insull did not mince his words. He expressed doubt as to whether railway men in general have learned how to sell transportation. He deplored the tendency to follow old-time precedents and habits. "A modern merchandising viewpoint to meet the new competitive conditions in the transportation business is needed," he said. He called attention to the all-important matter of rates of fare and pointed out that the fixed fare, although simple to collect, does not always make a balance sheet that will attract necessary new capital. He questioned frankly whether or not railway men understand yet how to sell their service and expressed doubt as to whether the fundamental economics of the transportation business is thoroughly understood.

"Once the fundamentals are thoroughly understood and confidence is restored within the industry itself as well as in the minds of the public it serves, a long step toward the restoration of the electric railway industry will have been taken," declared Mr. Insull. With public confidence and good will, the avenues to badly needed capital will be opened up. He advocated widely distributed ownership of utility securities in the community served as the greatest single safeguard from the attacks of unscrupulous politicians.

INDUSTRY IS SOUND

Continuing where Mr. Insull left off, Henry L. Doherty declared that nothing fundamental has affected the soundness of any branch of the utility business. If sufficient thought on the part of communities can be directed toward a basic understanding of the position which transportation occupies as a fundamental necessity to community development, relief from traffic difficulties, unfair tax burdens and inadequate fares can be obtained, he maintained. Just as it is a perfectly idle thought to assume that any modern community can get along and develop without an adequate system of transportation, he pointed out, so also is it futile to expect that such a system can be operated and improved to meet the needs of a community without assuring the safety and an adequate return on the invested capital.

Mr. Doherty called attention to the inevitable result of failure on the part of the public to recognize these

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basic principles. This, he said, results in the deterioration of service to an extent which imposes a heavy loss on the community in the form of retarded development, and ultimately brings a heavy additional expense for rehabilitating a crippled transportation system.

LITTLE TO FEAR FROM BUS

"The railway industry has little to fear from the bus," he declared. "If this new vehicle can successfully compete with rail lines, this fact should be established as soon as possible and immediate steps taken to develop transportation systems with that end in view. Up to the present time, experience with the bus has given no indication that it will replace rail lines except in limited instances. Only a united front on the part of the industry will establish these facts in the mind of the public."

Mr. Doherty also touched on the fundamental economics of railway fares. In transportation as in other branches of the industry, he explained, a large part of the cost is represented by the readiness to serve. Although the passenger benefits from this readiness to serve, the expense of meeting his actual use of the service is a comparatively small part of the total cost of establishing and maintaining facilities whose cost is fixed regardless of the amount of service used. The provision of these facilities, according to Mr. Doherty's views, affects the value of property in the community. Thus by assessing all or part of the readiness-to-serve cost in the form of a tax on the benefited property, the car rider himself would be required to pay only for the service which he actually uses.

Co-ordination of all forms of community transportation was held to be essential to the elimination of unnecessary duplication and waste. As part of such a complete co-ordinated system, he advocated that taxicabs should be considered as a public utility. In this way the service given by rail lines and buses would be made complete.

Other speakers included Britton I. Budd, G. A. Richardson, A. L. Drum, H. B. Flowers, Gen. Guy E. Tripp, Walter A. Draper, Capt. L. Vickers, A. C. Blinn, John J. Stanley, J. P. Barnes, T. A. Kenny, J. H. Alexander, B. W. Arnold, Dudley Montgomery and H. V. Bozell. In addition to the general status of the industry, public and employee relations, car development and bus operation constituted some of the subjects discussed.

CAR IS SALESROOM OF TRANSPORTATION SERVICE

"The sale and delivery of electric railway service is lodged in the car itself," said A. L. Drum in discussing the part which the electric railway car must play in popularizing electric railway service. Despite the merchandising importance of the cars on a given property, he asserted, they represent only between 15 per cent and 20 per cent of the total investment. Thus he explained that improvements in cars offer a means of popularizing electric railway service at a comparatively small cost in comparison with the total investment involved. It has been repeatedly demonstrated, he insisted, that improved light-weight cars will give savings of from 4 to 5 cents per car-mile in comparison with older and heavy equipment. Thus improved equipment offers the opportunity of making savings that approximate 15 per cent of the operating expenses of the average property. This, he estimated, would frequently add 50 per cent to the net earnings of such a property. Mr. Drum also cited an example of the saving in track construction cost which could be made through the use of light-weight cars. In this instance a property having 6 miles of track to rebuild found that through the use of lighter track construction made possible by lighter-weight cars the saving in track cost would pay the total cost of the new cars.

EXPRESSES FAITH IN IMPROVED CARS

Faith in Mr. Drum's proposal for improving the attractiveness of cars was expressed by Gen. Guy E. Tripp. The railway industry faces problems not met by other branches of the utility business, he explained. This is due to the existence of competition in transportation. Here, however, the situation is unique because the electric railways are a public utility and must provide a complete service. Since they are also subject to regulation both as to rates and service, the factors in competition cannot be given free play as in the case of other business enterprises. He held, nevertheless, that railways must recognize the necessity of meeting competition and that since regulatory bodies are partly responsible for the results of their operation, railway management should continue to press for relief from restrictive tax burdens. He advocated increased effort in placing before the public the necessity for a rate of fare which will permit a fair return to be paid on invested capital. He expressed confidence in the future of electric railways and maintained that they can be put on a paying basis.

Further comment on Mr. Drum's remarks regarding the importance of the car in popularizing electric railway service was added by Britton I. Budd. He declared that Mr. Drum's suggestion was vital to the industry. Equipment and service which were at one time satisfactory no longer meet the demands of the modern public. The public today, he explained, has become educated to luxury and speed. In some smaller cities automobiles pass electric cars at will. Under such conditions the speed of cars should and can be increased. On interurban properties when autos pass the electric trains a bad sales psychology is developed. He insisted that electric railways which expect to build up traffic must furnish the speedy transportation demanded by the public.

There has been a failure on the part of cities to plan their transportation requirements in advance, according to Mr. Budd. This has materially affected the development of such communities. When traffic congestion in the business district of a city interferes with the transaction of business, it results in the development of outlying community centers. This process, he pointed out, is rapidly taking place in some of our large cities and will continue until some means is found of relieving the situation in the principal business district.

There are three principal factors in the success of transportation service, according to G. A. Richardson. From the standpoint of management, these consist, first, of selling the organization itself; second, giving proper service and, third, with the help of enthusiastic employees and efficient service, selling the public. Experience in bus operation and the importance of human contact between management and men supported by application of the golden rule in employee relations formed additional subjects for discussion. Chairman Cobb expressed gratification at the success of this initial conference in bringing together financial leaders and operators for the discussion of problems important to the success and development of the industry.

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Association News & Discussions

Southern Equipment Men Hold Annual Meeting in Mobile

Delegates Consider Questionnaire on Maintenance Practice Comprising 54 Topics—Papers on Gas-Electric Bus, Controller Maintenance and Repair Practice in New Orleans Also Presented

A THREE-DAY session of the Electric Railway Association of Equipment Men, Southern Properties, was held at the Battle House, Mobile, Ala., on Feb. 24-26. During the period since it was organized some four years ago this association has established an enviable record for the assistance which it has given its members in solving their equipment problems. Two meetings are held each year at which questions relating to the every-day equipment practice of the companies are considered at an informal "round table," and a few papers are presented. At these meetings and during the year maintenance performance records, particularly the number of pull-ins per 1,000 car-miles for all of the different properties, are compiled and compared, and in other ways the association aims to improve the standard of maintenance and exchange helpful information.

The sessions at Mobile were presided over by A. D. McWhorter, general superintendent of the Memphis Street Railway and president of the association, and some 50 representatives of member companies and supply men were present.

The opening of the first session was the occasion for everyone to become acquainted, after which President McWhorter spoke of the importance which reliable equipment had in creating and maintaining good public relations. After all, transportation was what the public wanted, and it was the duty of the equipment men to see that this was supplied by clean, comfortable cars which would carry the passengers safely to their destination, in a speedy manner. He also explained the postponement of the meeting for a month by the fact that he and the secretary, Mr. Taurman, had been called to make a report on the Havana Electric Railway. This line, Mr. McWhorter said, has 34 miles of double track and a total single-track equivalent of 97 miles, there being 63 miles of route. The ratio of inhabitants in the city to miles of route is quite high, being 8,100, as compared with 2,650 in New Orleans, 2,300 in Memphis and 2,120 in Birmingham. The population of the city per square mile is high and the number of revenue passengers per square mile is also high. The conditions of street congestion are quite bad. The company has 2,700 trainmen, including 50 colored motormen, and the schedule speed of the cars is 8½ m.p.h. Only four passengers are permitted to stand on a car. There is considerable jitney and taxicab competition, the former being known in Havana as "guagua" and the latter as "alquela." The jitneys are Fords or other low-priced automobiles or converted trucks and charge a 5-cent fare. The taxicabs are very numerous and charge 20 cents per zone.

The report of the committee on classification of pull-ins was presented by the chairman, W. H. McAloney, superintendent of equipment Georgia Railway & Power Company. After discussion the classification given in the adjoining table was adopted.

Three formal papers were also presented at the session on the first day, namely: "The Gas-Electric Bus," by J. C. Thirlwall, General Electric Company, Schenectady; "How We Improved Our Pull-in Records in 1925," by Frank T. Dawkins, electrical engineer of that company, and "The Overhauling of Controllers," by T. R. Bristol, assistant superintendent of equipment Georgia Railway & Power Company, Atlanta, Ga. Mr. Bristol's paper is published in abstract elsewhere in this issue. The other papers will be abstracted in an early issue. A. Taurman, superintendent of equipment, way and structures Birmingham Electric Company, gave a talk on car inspection at Havana, Cuba, which he had recently visited. He spoke of the climatic and other conditions in Havana, some of which made equipment maintenance simple, but others, like the narrow streets, added to the difficulties. He said the property was well maintained.

There was a discussion on radio detection of defective cars and reduction of inductive interference. John Gerson of the Charleston Consolidated Railway & Lighting Company contributed the results of some tests made on that property, and other speakers gave facts in regard to the detection by radio equipment of leaky transformers by power companies.

The accompanying charts are reproduced from a blueprint pamphlet given to each delegate, giving records of

Delegates and Guests at the Mobile Meeting of the Electric Railway Association, Equipment Men, Southern Properties, Feb. 24-26

PULL-IN CLASSIFICATION ADOPTED FEB. 25, 1926

Chargeable to Equipment Account	
Armature, grounded.	Headlights.
Armature bands.	Signal lights.
Armature shaft.	Door switch.
Armature bearing hot.	Heaters.
	Electric bells.
Axle bearing hot.	Lightning.
Commutator.	Car charged.
Brush yoke.	Axles.
Brushes and holder.	Wheels.
Fields.	Journals and boxes.
Fields jumper.	Hot journals.
Motor leads.	Hand brakes.
Gears and pinions.	Slack adjusters.
Gear cases.	Brake rigging.
Other motor trouble.	Other truck troubles.
Trolleys.	Doors and riggings.
Circuit breakers.	Door treadles.
Line breakers.	Windows.
Main fuse.	Seats.
Controller.	Steps.
Cables.	Registers.
Rheostats.	Signs.
Air brakes.	Gongs.
Safety car equipment.	Sand rigging.
Door engines.	Fenders.
Whistles.	Draw bars.
Frozen air.	Snow scrapers.
Other air troubles.	Other body troubles.
Lights.	Unclassified.
Not Chargeable to Equipment Account	
Accidents.	Broken glass.
Split switches.	Trouble reported, none found.
Derailments.	
Doors and steps.	Unclassified.

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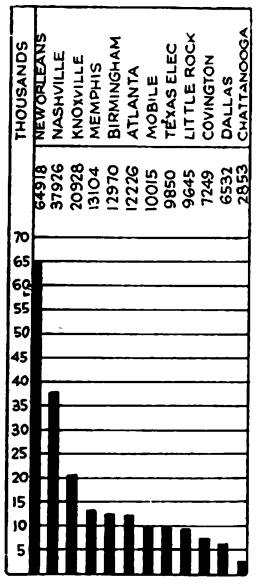


Average Miles per Pull-in for 1925

miles per pull-in on different member properties since they joined the association. As will be seen, these give an almost continuous record of improvement in maintenance conditions since the association was organized and records began to be compiled.

Round-Table Discussion

The greater part of the remaining sessions of the association were given over to the discussion of a series of 54 questions which were printed in advance and were considered seriatim. A summary follows:

The first question related to experience with devices to eliminate water from air-brake systems. It developed that no companies are using any method except that of draining the tank and paying especial attention to piping. The consensus of opinion was that proper installation of piping would eliminate the trouble.

On the question of side wear on brushes of modern ventilated motors with high-speed armatures it was the belief that most ventilated motors showed this trouble. The latest practice of taking the air from the top of the motor, thus eliminating most of the dirt and consequently the principal cause of the side wear, it was thought, would greatly reduce this trouble.

On the use of Rico oilers for modern motors it was found that none of the companies had any extensive experience.

Most members are using pit wheel grinders; two reported employing wheel truing brakeshoes.

The majority of companies represented use baking ovens of sheet iron, lined with asbestos and electrically heated. One company reported it had built an oven of fire brick and clay and considered it superior to the more common sheet iron and asbestos type.

A great variety of practice was found as regards the material used in which to dip armatures. Two companies use a varnish on their armatures after they have been dipped and dried out thoroughly.

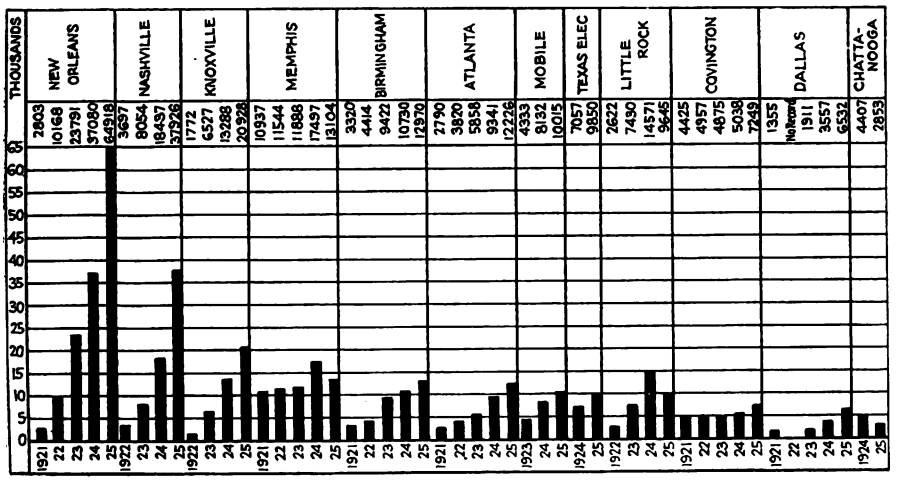
Several delegates reported great trouble with broken motor bolts even when using the best heat-treated bolts. Others find the ordinary bolt adequate. It was suggested that some of the trouble with threads stripping may be caused by too great tightening of the nuts.

Between enamel and lacquer for car painting most of the companies are using the former, though one, on the last 40 cars ordered, specified 25 to be finished in enamel and fifteen in lacquer. It was thought that there is not much difference in cost, but enamel dries more quickly. The chief trouble in paint maintenance is in the bottom door panels and the bottom sash stiles. Metal sash frames have been ordered by at least one company.

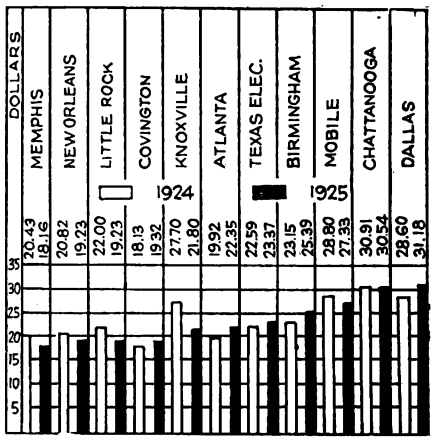
The next question related to the accounts to which time for brake and truck inspectors replacing brakeshoes and tightening motor and truck bolts and minor repairs was charged. One company, after a trial period, decided to charge the time of the inspectors, 70 per cent to inspection and 30 per cent to maintenance. On other roads, time cards are used.

Between bronze and malleable iron and babbitt for axle bearings, most members prefer the former. At least one company adds a film of babbitt about $\frac{1}{8}$ in. to its bronze armature bearings.

No companies reported waxing cars, though two Southern companies, not in the association, are said to do this every six months. On the question of white cars it was reported that one company, not in the association, which



Average Miles per Pull-in by Years 1921-1925



Comparative Maintenance of Equipment Costs

had adopted this color was giving it up because it showed dirt so easily.

Two companies are using aluminum field coils, one having used them for from four to five years.

Educational Courses Given

Several companies are giving, or have given, courses in maintenance to shop men. On one system lectures were given by the master mechanic and engineers, at the shop, for one hour a week. Half of this period was on company time, the other half on the men's time, and no one was accepted for the course unless he signed up and agreed to stay through the course. It proved very popular. Another company sent seventeen or eighteen of its men to an engineering night school and several give talks to their men from time to time, especially on the cost of material used in maintenance. Four companies have issued instruction books for the use of its men.

The use of welding for repairing broken armature shafts is not common, the general opinion being against this practice, though some companies manufacture their own armature shafts out of old 4-in. heat-treated axles.

Acetylene, electric and thermit welding are used for repairing broken motor frames, though electric welding is the most commonly used. One company scarfs the crack with acetylene, then uses the electric weld for filling up the crack.

The two principal causes for chipped flanges on cast iron wheels given were obstructions like bolts, in the rail groove and improperly repaired special work which had been welded by the track department but not ground out properly. Most of the companies use a difference of $\frac{1}{4}$ in. between wheel gage and track gage, but one company reported considerable trouble with a difference of more than $\frac{1}{8}$ in. Most of the companies said there had been an increase in flats on cast-iron wheels, due, it was thought, largely to the misuse of sand by the motormen, but also partly to more sensitive brakes. One company recommended the use of grease lubrication on the air-brake valve rather than oil, because oil gets dry and the motorman, in making a stop, throws the valve to the emergency position by mistake. Several of the companies are using steel wheels to a greater or less

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extent and report a mileage from them of from three to four times that of cast-iron wheels.

One company reported the use of trolley shoes on its interurban lines and its representative believed the supply of current was more uniform and there was a great reduction in wear on the wire from sparking. The chief trouble came when inspectors increased the trolley pressure to 40 lb., whereas half of that was adequate. One Southern company not in the association, which is using shoes exclusively, was reported to be greasing its trolley wire once a month.

In general, the companies which use circuit breakers do not also use fuses. A variation in practice was found in the location of the fuses, being sometimes on the platform and sometimes under the car.

Short Ground Leads Desirable for Lightning Arresters

An equal variety of practice was found in the position of the lightning arrester. One company using electrolytic arresters carries them under the car where they are easy to inspect. Another, using aluminum arresters, places them on the top of the car, where they are inspected by the trolley base inspector. The argument for placing them on top was that it gave a shorter and direct ground.

The principal modern makes of gears and pinions have users among all the companies represented. Some records for gears given were 500,000 miles and for pinions 200,000 miles. One company reported a make of gear used since 1911 with none yet worn out. Another uses cheap gears with old motors, expecting both can be discarded about the same time.

Air gongs are used by several of the companies but some trouble was reported with the cylinder type of gong from freezing. This trouble is not experienced with the ball type. One company is using rotary gongs, worked by the foot.

Periods of washing cars vary from every day to every week, though most of the companies have their cars swept out every time they return to the barn. Soap is used by a few companies but generally only on the floors. One company with linoleum flooring said it had to be washed once a day.

One company is using a battery testing machine for testing armatures and fields without removing them from the car. Others have the Century tester.

Slat Seats Favored in the South

A vigorous discussion developed over the proper material for seats, the majority opinion being strongly in favor of slat seats. In one city these are required by a rule of the board of health. The coverings discussed were rattan, leather, plush and a material in which rubber is a constituent. Plush was criticised as hard to keep clean, expensive to maintain, and soiling the clothing of passengers in hot weather. One delegate declared that in the South with plush seats it would be necessary to use slip covers in hot weather.

In general, solid carbon brushes are used on motors, although some companies prefer the split type. A variety of makes are used.

Some companies use water for scrubbing the floors sometimes applied through a hose, but others do not permit the use of water within car. Those who use it admitted that it might be detrimental.

In general, sentiment favored the use of single-end cars on account of their lower first cost and cost of maintenance. By the use of a line switch and motorman's valve at the rear end, these cars can now be arranged for emergency backing. One company reported the recent purchase of 30 single-end cars for $30,000 less than double-truck cars would have cost, with increased seating capacity and reduced weight, but considerable money had to be spent in providing loops. It was admitted that the single-end car was less flexible from a transportation standpoint.

Welfare work in the form of group insurance, loans to needy members, etc., is common among the properties represented in the organization and is usually conducted through the mutual benefit association.

Different methods are used in installing window glass. Putty and beads are used by some, rubber by others, and one company uses rubber on the top sash but putty on the bottom sash.

A few companies are using non-scale air pipe and find it satisfactory. Both air operated and electrically operated registers are used to some extent.

Two companies said they were using home-made waste reclaimers. Attention was called by one of those present to the satisfactory results obtained by the centrifugal machine.

Most of the companies have a certain amount of all-rubber motor lead cable in use, though in most cases for less than two years. One case of the use of this type of cable for four years was reported. Three or four companies also reported the use for a short time of the new General Electric D.B. 986 line breaker with L.B. 2-A handles.

The final subject discussed was the desirability of dispensing with trapdoors in the floor. The principal objection seemed to be the difficulty in adjusting motor brushes, but it was reported that this could be done by feel, after some experience. Inspection of motor leads also gave some trouble when there was no trapdoor.

Election of Officers and Other Business

The technical sessions of the association lasted for the first two days of the meeting. On the evening of Feb. 25 all those in attendance at the convention were the guests of the Mobile Light & Railroad Company, at a fish dinner, served in the Battle House. Mobile is famous for the delicious flavor of the fish caught near its harbor and about 50 delegates enjoyed the hospitality of the company.

On Friday morning a short business meeting was held at which A. Taurman presented his report as secretary and treasurer. It showed that the association, on the basis of $50 a year annual dues for each company, was in good financial condition. For officers for the coming year, the nominating committee, consisting of S. M. Coffin, Mobile; W. H. Curtis, Little Rock, and J. J. Vaughan, Memphis, proposed the present incumbents for another term. They were unanimously re-elected.

Invitations for the place of the July meeting were received from the Chattanooga Light & Railway Company to meet in Chattanooga, from the Central Electric Railway Association to hold a joint meeting with that association on its boat trip next summer, and from the Ohio Brass Company to meet in Mansfield, Ohio. It was finally decided to hold the next meeting in Chattanooga, Tenn., on July 28, 29 and 30.

Resolutions were passed thanking the officers for their services during the year and expressing the appreciation of the association to the local committee, consisting of F. F. Rossman, vice-president and general manager, and S. M. Coffin, superintendent of equipment Mobile Light & Railroad Company, for their hospitality and the enjoyable time had by all. The meeting then adjourned.

After the meetings had finished the members and their guests were taken on an automobile ride, through the courtesy of the officers of the local system, to see the city and the points of railway and historic interest.

COMING MEETINGS
OF
Electric Railway and Allied Associations

March 8-11—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

March 9-11 — Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa, Okla.

March 11—Pacific Railway Club, ninth annual meeting, Fairmont Hotel, San Francisco, Cal.

March 12 — Pennsylvania Street Railway Association, annual meeting, William Penn Hotel, Pittsburgh, Pa.

March 17-18—Central Electric Traffic Association, Portage Hotel, Akron, Ohio.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

March 29-31—National Conference on City Planning, St. Petersburg, Fla., April 1—West Palm Beach, Fla.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention, location not yet determined.

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Shop Practice in Overhauling Controllers*

By T. R. Bristol
Assistant Superintendent of Equipment Georgia Railway & Power Company

CONTROLLERS are not removed periodically for overhauling. When cars are overhauled controllers are not removed unless there is evidence of an insulation breakdown. This can be readily ascertained when the repairman has the insulating partition back of the controller cylinder out for cleaning, as the wiring is then visible.

When cars are overhauled the controllers are given a light overhauling on the car, which consists of removing the main cylinder and insulation partition back of the cylinder. An inspection of insulation on wiring and frame is made. The insulated partition is thoroughly cleaned of all copper dust and smoke and given a coat of insulating varnish. The controller cylinder is taken to the repair bench and new segments put on where necessary. Segments are cleaned up by filing. The top and bottom bearings are checked for wear, and bushings are renewed where necessary. The reverse cylinder is taken out and segments are filed smooth.

Main and reverse cylinders are assembled in the controller and fingers are renewed where necessary. Any rough fingers are removed, new ones installed and old ones are filed up in spare moments. Fingers are aligned properly and cut out switch blades are checked for tension and renewed where necessary. The series stop, star wheel pawls and springs are checked and repairs made if needed. The controller is then lubricated and its jacket is given a thorough cleaning with gasoline and brush, and the inside insulated covering is given two coats of shellac. This method may be termed light overhauling.

Controllers removed from cars for defects are given a general overhauling. They are completely stripped, with the exception that wiring is not removed from the finger board or from the back of the connection board. The frame, top cover, main and reverse cylinder, connection board and finger board are sand blasted to remove all copper dust, smoke and carbonized spots. Parts which may be damaged by sand blasting are taped up.

We are considering a modern sand-blast equipment and in all probability will install it this year. It is known as the down-draft method, and consists mainly of a steel room with a special flooring and ceiling. Fresh air is drawn into the room through the ceiling by a suction fan and distributed evenly to all parts of the room. The floor consists of steel grating through which air and sand are drawn into a large hopper. Sand blasting is done on the floor or on a bench as convenience dictates.

It was deemed necessary to sand blast controllers because scraping and brushing did not eliminate all copper dust, carbonized spots and dirt. The insulation on the back is removed regardless of its appearance, because it has been found to contain moisture and considerable trouble was traced to this condition.

After sand blasting, the back is given two coats of clear insulating varnish. The asbestos paper is given one coat of clear insulating varnish on one side and fastened to the back while wet. After drying the asbestos paper is given a coat of insulating varnish to insure its being moisture-proof.

Main and reverse cylinders are cleaned up, segments filed smooth and renewals made where necessary. Then they are given two coats of clear insulating varnish. In cases where cylinders are found out of round, they are trued up in the lathe. It is only occasionally that we find a cylinder out of round, this usually being on old controllers which were not built on jigs.

Top and bottom bearings are checked up for lost motion. On K-35 controllers, having brass bushings, new bushings are inserted. K-28 controllers originally did not have a bushing in the bottom bearing. When putting on line breaker attachments we found considerable lost motion in the bearings which affected operation of the line breaker attachment. We bored out the bottom bearing and put in a removable bushing, similar to that in the K-35 controller. To do this it was necessary to reduce the shaft diameter at the bearing from 1 in. to $\frac{7}{8}$ in. in order to get a bushing with $\frac{1}{8}$ in. wall thickness.

The top bearing (in top plate) is brazed up and rebored where necessary. The bearing is first bored out oversize and then brazed up solid, to prevent breaking through into the old metal when reboring. Finger and connection boards and wiring are repaired and given two coats of clear insulating varnish and assembled in the controller. The controller is built up complete and after alignment of fingers is given an 1,100-volt alternating-current ground test for five minutes.

We have discontinued the use of molded insulating finger and connection boards, because we found that any burned place which will carbonize material will give further trouble, as it cannot be scraped out clean. We make finger and connection boards of hard wood, either cherry or maple, and after finishing put them in the oven and bake for six hours, at 200 deg. F.; then boil them in paraffin for about five hours. By this process we have found that the paraffin penetrates through the entire wood fiber.

Controller magnets are tested by checking the resistance. The outside insulation is removed and a resistance test is made. The resistance testing machine consists of a 6-volt storage battery, ammeter and variable resistance, all connected in series. The magnet coil is connected in series in the battery circuit, and the resistance unit is adjusted so a circuit of $2\frac{1}{2}$ amp. is flowing through the circuit. A millivolt meter is bridged across the magnet coil and the drop is noted. A low reading indicates shorted turns in the magnet coil. A high reading indicates a poor connection. The test is made primarily to detect poor connections, as wrong resistance and shorted turns have never been found. Repairs are made to the magnet coil and it is again checked for resistance, after which it is heated for two hours, dipped in plastic for one hour and baked for twelve hours.

After baking, the binding insulation is put on; for the K-6 and K-11 controllers it consists of two layers of $1\frac{1}{2}$-in. asbestos tape and one layer of field webbing. The coil is dipped in plastic and baked for twelve hours.

The outer insulation of K-6 and K-11 magnets is merely a shield to protect the windings, three layers being sufficient. The K-28 controller magnets are slipped on an iron core and must be insulated against grounds. One layer of varnished cambric is first applied, then two layers of asbestos tape and one layer of $\frac{3}{4}$-in. linen tape are added. The coil is then dipped and baked. The design of the K-28 controller does not permit of heavier insulation on the controller magnet or we would probably add another layer of tape as a further protection.

*Abstract of paper presented at annual meeting of Electric Railway Association of Equipment Men, Southern Properties, held at Mobile, Ala., Feb. 24-26, 1926.

Making Trolley Company Complete Transportation Agency

New England Street Railway Club Discusses Bus and Taxicab Operation—Care in Establishing Co-ordinated Service Recommended

MORE light on the relations between bus and trolley was shed at the meeting of the New England Street Railway Club held Feb. 25 at the Copley-Plaza Hotel in Boston. This was scheduled for Feb. 4, but postponed on account of the blizzard that struck the territory. On the original program was a paper by G. T. Seeley, vice-president Chicago Motor Coach Company. While not presented, this paper will be published in the bulletin of the club, it was announced. The annual meeting of the club, to be held March 25, will be a "ladies' night" affair.

Papers on the relationship of the bus and trolley were given by W. B. Spencer, assistant to the president United Electric Railways, Providence; Edward Dana, general manager Boston Elevated Railway, and M. C. Horine, sales engineer Mack Trucks, Inc., New York. To supplement these J. A. Queeney, vice-president Mitten Management, Inc., gave impromptu the details of how the Philadelphia Rapid Transit Company had recently entered the taxicab business.

In picturing the trolley as the big brother and the bus as the little sister, and in urging trolley companies to become transportation companies, although not to a delirious extent, Mr. Spencer had the support of the other speakers. He illustrated possible growth by reference to a crosstown line in Providence. This started on a 60-minute headway. In about a year it had developed so that six-minute service was necessary. During that period revenue increased from 31 to 36 cents per

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bus-mile in round figures. Mr. Spencer called attention to the field for small capacity buses. A twelve-passenger size making two or three trips an hour could replace a 40-passenger trolley, the latter run on an hourly headway. This would keep out transportation "bootleggers," or individuals running small automobiles in defiance of regulatory authorities.

Mr. Dana warned against the blandishments of bus salesmen and urged his auditors not to pay too much attention to bus costs. The bus should be looked at just the same as the turnstile or a rotary substation, all useful parts of the property and to be used to make the property profitable as a whole. In spite of the huge increase in the number of buses operated by the Boston Elevated (Mr. Dana explained that from nothing five years ago the system has grown to represent nearly 175 units) the mileage operated by the trolleys had increased, and it was expected that it would increase in the future. At the same time the bus should be developed in accordance with good business judgment.

Little sister is growing up and has become better looking, according to Mr. Horine. He held that the bus furnished a separate class of service which should be charged for at a higher price wherever possible and operated on a distinctive basis. It was dangerous, he thought, to carry over the "trolley mind" to bus operation. As examples of this he mentioned the failure to call streets, which has become quite general on trolleys. The bus was so low that passengers did not see the street signs or numbers well, so that drivers should always be careful to announce the street names. Mr. Horine also urged better route marking, quieter fare-registering devices and an effort all along the line to give a higher class service on the buses. Cleanliness and also the appearance of the drivers he believed to be more important than on the trolley. He would eliminate straps in buses, because of the bad name given them through yellow journalism. Reduced fares for school children frequently led to inconvenience for regular patrons and so special trips should be run to carry the children.

The 25-passenger bus, Mr. Horine declared, was the best for all around work; double-deckers had a place, but should not be used when they meant such infrequent headway as to result in a loss of passengers to other forms of transportation.

Mr. Queeney stirred the assembly to an appreciative demonstration when he recited an incident indicating that the efforts to become an all around company might have its limits. The owner of a local funeral business wanted to sell out to the P.R.T. and represented the value of the property by figures showing the diversification of the load factor. These indicated that there were 462 deaths a day in Philadelphia; of these, 37 per cent were Catholics and were buried in the morning, and the others in the afternoon. Most of the weddings were in the morning, and these also represented possible business. Mr. Queeney turned it down as it was more of a personal than a public business. Still he believed that the trolley company should not hesitate to take up any vehicle that could be operated at a profit. Trolley revenues, he maintained, had dropped off steadily in general for years and the only thing to do was to take up some new form of transportation. He cited the gas industry as an example of one that has come back after every one said it was doomed when electricity was introduced. The present trolley systems will come back to prosperity in just the same way, he prophesied, if they are willing to become a transportation industry. He would first have the trolley company take in the bus and then the taxi. If people wanted to ride on roller skates he suggested furnishing even them.

The Philadelphia system has taken delivery so far of 250 buses and has carried 11,000,000 passengers in six months. This year Mr. Queeney looks for a business of not less than 30,000,000 passengers. Bus operation would be extended as fast as required. Commenting on the recent purchase of a taxicab company by the P.R.T., he said he could see no reason why this type of business should not be handled if people wanted the service and if it was making inroads into the other business of the transportation company. The purchase of the Yellow Cab Company in Philadelphia involved 950 taxicabs, which last year carried 10,000,000 passengers. There are about 1,500 or 1,600 taxicabs in Philadelphia, he said, and these will be bought if they can be secured at a fair price that will be approved by the State Public Service Commission.

According to Mr. Queeney, the taxicab business in New York City is taking in more money than the street cars. There are 18,000 taxicabs there, earning from $25,000,000 to $30,000,000 a year. If the present rate of growth is maintained in Chicago the same condition will exist in another two years.

Bus maintenance was taken up at an afternoon session, when systems and methods used in their organizations were described by C. V. Wood, Jr., superintendent bus division United Electric Railways, Providence; H. I. Sullivan, automotive engineer Eastern Massachusetts Street Railway, and D. S. McKay, supervisor of automotive equipment Boston Elevated Railway.

American Association News

Wheel Gages

SEVERAL new standards for wheel gages were decided on at a meeting of special committee No. 8 of the way and structures committee assigned to study the subject of various types of wheel gages, which held a meeting at association headquarters, New York, Feb. 26. The following were present: C. W. Squier, chairman; C. A. Alden, W. S. Adams, Hugh Savage and A. W. Baker.

It was recommended that the two standard A.R.A. wheel contours which now appear in the Manual should be designated as *E* and *F*. Contour *E* is A.R.A. standard for chilled iron wheels as adopted in 1909, and *F* is A.R.A contour for steel and steel-tired wheels standardized in 1920.

The committee decided to recommend the use of the standard A.R.A. mounting and check gage for mounting wheels with A.R.A. contours. This gage is to have a center point added similar to the A.E.R.E.A. standard wheel mounting gage. The committee reviewed the present association standards of limit of wear gages for standard contours, and also the various types which are used by the American Railway Association. The present association standards provide only for a limit of flange thickness. It was considered desirable that these gages should also provide maximum and minimum limits of flange height, and new designs for gages will be prepared with these additions.

In considering revisions of the wheel checking gage as submitted by the 1925 equipment committee, it was decided to resubmit the gage with all references to the A.R.A. contours omitted, so that this gage will apply only to contours *A*, *B*, *C* and *D*.

The subject of taping wheels was discussed and it was decided to submit a wheel circumference measure for wheels similar to that used by the American Railway Association. The dimensions, however, will be modified so as to meet the present practice as to the point for taping narrow tread wheels.

Special Reports Available

SPECIAL reports as listed below have been prepared by the Bureau of Information and Service of the American Electric Railway Association and are available to member companies upon request:

Bulletin No. 69.—Wages of Trainmen.—This is an entirely new edition of our regular wage bulletin, based on replies of approximately 500 companies to a questionnaire sent out in February. It shows the present wage scale, the effective date and date of expiration, the previous scale, union affiliations of trainmen, number of men employed, contract conditions governing wage scale, and the average weekly wage earned by regular and extra men under the scale.

Bulletin No. 70—Wages of Bus Men.—This compilation shows substantially the same information for bus operators as is shown in our bulletin of trainmen's wages, namely, present scale of pay, effective date and date of expiration, union affiliations of bus men, number of bus men employed, average weekly wages earned under the scale, etc. The data of more than 150 companies are included in this bulletin.

Bulletin No. 71.—Public Ownership and Operation of Electric Railways, Part 2, Canadian Companies.—This is a compilation of the outstanding facts concerning the public acquisition and operation of electric railways in Canada. It includes a list of publicly owned or operated railways, a history of the events leading up to their acquisition, the terms on which they were aken over, and statistical data on the results of their operation under public management.

In addition to the above, supplements to the Fare Bulletin and Cost of Living Studies (Bulletin No. 72) have been prepared so as to bring them down to date.

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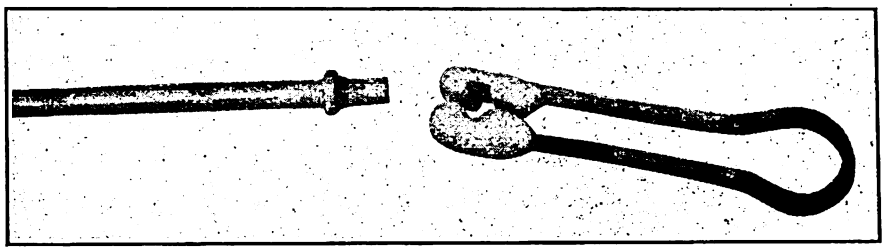
Maintenance of Equipment

Door Handle Fit Made in One Operation

WITH manually operated folding doors and steps, it is the practice of the Eighth Avenue Railroad, New York, N. Y., to use an upright rod on which a handle fits for operating the mechanism. The handle fits become worn through service, so that it is necessary to bring these back to size. The expense of forming the handle fit on these rods has been reduced considerably by use of a die to form the end of the handle by means of a blow from the drop hammer.

The accompanying illustration shows the die used for forming and also the end of one of the rods with the handle fit completed. In practice, the rods are heated and upended so as to increase the size. Then the die is placed around the hot part and with one blow of the hammer the entire fit at the end of the rod and a lower shoulder are completed.



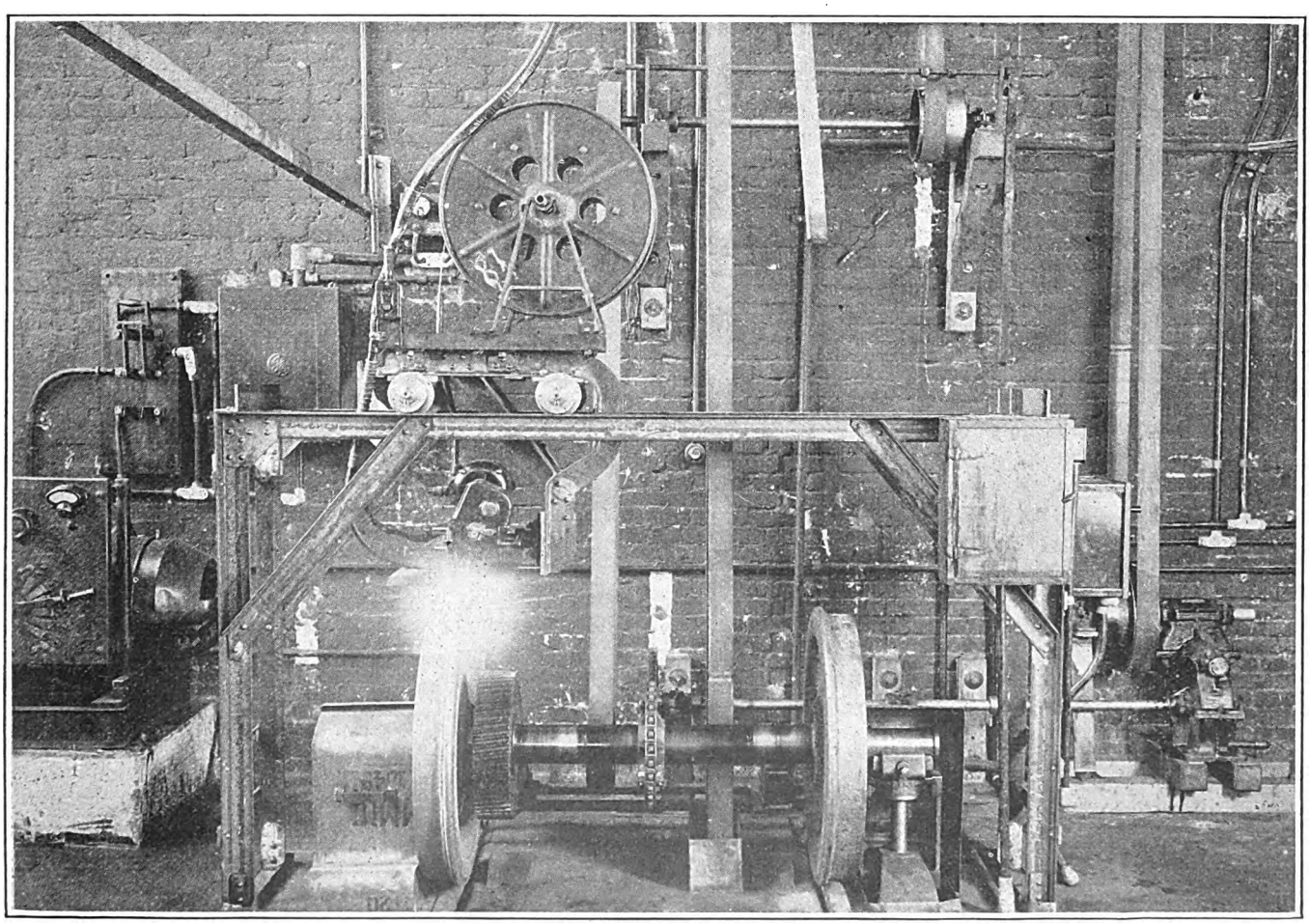
Making Handle Fits for Door and Step Operation
At left—A rod completed with handle fit at the end. At right—Die used to shape the end of the rod.

Flexible Arrangement for Welding Wheel Flanges

By J. R. Brittain
Mechanical Engineer Los Angeles Railway, Los Angeles, Cal.

AUTOMATIC arc welding of steel wheel flanges by means of a metallic electrode is standard practice in the shops of the Los Angeles Railway, Los Angeles, Cal. The equipment used consists of a General Electric automatic welding head with supporting equipment and driving apparatus for the wheels designed in the mechanical engineer's office of the company. The entire mounting for the equipment was constructed in the shops of the Los Angeles Railway. An accompanying illustration shows the general arrangement.

The welding head feeds the wire



Equipment Used to Weld Wheel Flanges in the Shops of the Los Angeles Railway

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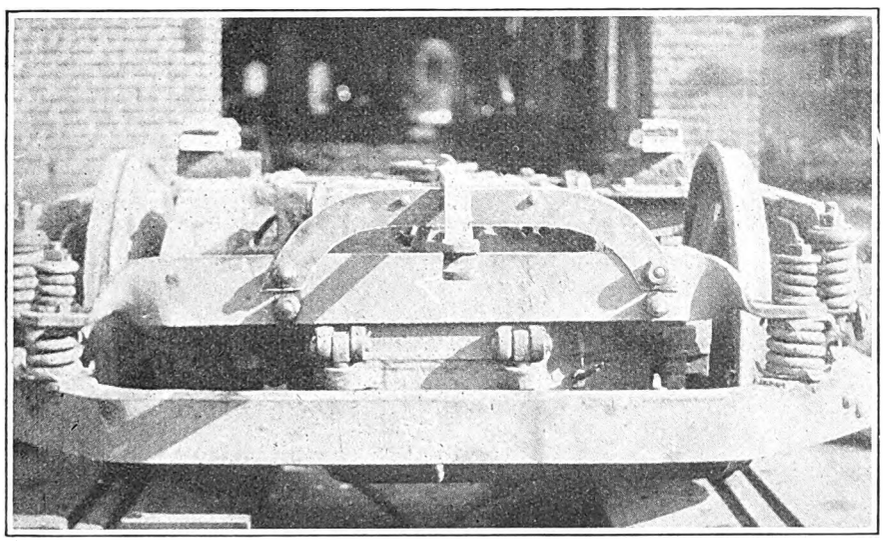
electrodes uniformly to the work at three different speeds, which are under the control of the operator. Wheels to be repaired are brought to the welding room track and are rolled to the welding outfit. Mechanically operated jacks raise the wheels from the track so as to allow free rotation. Standard bearings are used on the heads of the jacks so that the actual journals of the axle revolve in these bearings. A steel carriage mounted on a steel frame supports the welding head and also the reel which holds the metallic electrode wire. The carriage may be moved freely along the top of the framework and is brought over the second wheel when work on the first is completed.

To rotate the wheels, a split sprocket is adjusted to the axle and a link chain is slipped over its teeth so as to connect with a companion sprocket located on the driving axle about 4 ft. back of the wheel axle. The equipment used to drive consists of a 2-hp. variable speed motor with a maximum speed of 1,000 r.p.m. and a minimum speed of 500 r.p.m. This motor is connected by belts and pulleys with a speed reducer which is especially designed to bring the speed from 1,000 r.p.m. to one-third of one revolution per minute. On the reducer shaft are mounted two pulleys of different diameters, by means of which the speed can be reduced again so as to obtain travel at the periphery of the wheel ranging from 7.99 in. per minute to 32 in. per minute. The speeds intervening between these maximum and minimum limits are obtained by regulating the speed of the motor through a rheostat. In this manner, the wheels to be welded are revolved at exactly the same speed as that with which the electrode is fed to the welding head.

In order to keep the area to be welded continually clean and bright and to insure a steady arc, good penetration and a satisfactory weld, a set of circular steel wire brushes are mounted so as to be operated mechanically. These bear against the surfaces of the wheels and run at a speed of about 1,000 r.p.m.

Keeping Brake Rods Off Motor Cases

SOME time ago the Virginia Electric & Power Company had trouble on its Richmond, Va., cars with wear between the brake rod and the top of the motor. The trouble was most marked on some cars equipped with maximum traction trucks, when there was not much clearance over the motor, and with motors which were rather high, like GE-57, 67 and 90 and Westinghouse 101-B. However, the condition existed to some extent on a considerable proportion of the old double-truck equipment.



This Arch Support Prevents the Brake Rod from Chafing on the Top of the Motor

After some experimenting, W. J. Hicks, master mechanic of the company, decided to provide a wearing support for the brake rod to rest on. The results have been so satisfactory that the double trucks under all cars are being equipped with this support as the cars go through the shops. The end view of a truck equipped with this device, reproduced on this page, shows the general form and purpose of this support.

This arch support is made up of two pieces. One is a 1½-in. x ⅜-in. iron bar forged to the shape shown and riveted to the cross bar of the truck. The other piece is a 1½-in. angle bolted along the top of this arch bar to provide the flat surface on which the brake rod can rest and slide. A flat brake rod instead of round rod has to be used because of the small clearance above the support.

The device shown has eliminated all of the trouble from this cause formerly experienced.

New Equipment Available

Special Ballast Dipper

IN THE last few years ballast cleaning has become a matter of importance to maintenance of way officials, and as the handling of this material is very costly, particularly so on busy lines, much thought has been devoted to new methods of handling. To meet this demand the American Hoist & Derrick Company, St. Paul, Minn., has designed and built a special dipper stick on which the dipper is set at a rakish angle to permit it to dig in close to the ends of the ties.

For loading ballast with the American railroad ditcher equipped with the new special ballast shovel the usual dump car work train line-up is used. Due to its construction, the shovel is always operated over the right-hand side of the flat car on which it works. This means that when operating on one track of a double-track system the ditcher removes ballast from the space between ties to a depth of approximately 20 in. below the ties. This distance between ends of ties varies from 4 ft. 6 in. to 5 ft. 6 in. When the distance between ends of ties is 5 ft. 6 in. a 30-cu.yd. dump car filled reasonably full represents 75 ft. of ballast dug from between ties. This 75-ft. distance increases as the distance between the ends of ties decreases.

With one car filled, the ditcher turns through 180 deg. and operates over the other side of the flat car, now facing the second dump car. It fills this second dump car with foul ballast removed from the shoulder of the roadbed, and again a reasonably well-filled car represents about 75 ft. of roadbed ready for new ballast. The new dipper design is of great convenience in this work.

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Overlapping Joint in Gear Case

THE new malleable-iron gear case of the GE-265 railway motor of the General Electric Company incorporates an overlapping joint, a unique feature which keeps out dirt and moisture and which affords a means of making adjustments to compensate for any wear of the supporting brackets. The case embodies the advantages of malleable iron rigidity and strength, yet its weight is no greater than that of the gear case formerly used with this lightweight motor.

Six Metal-Working Machines Combined

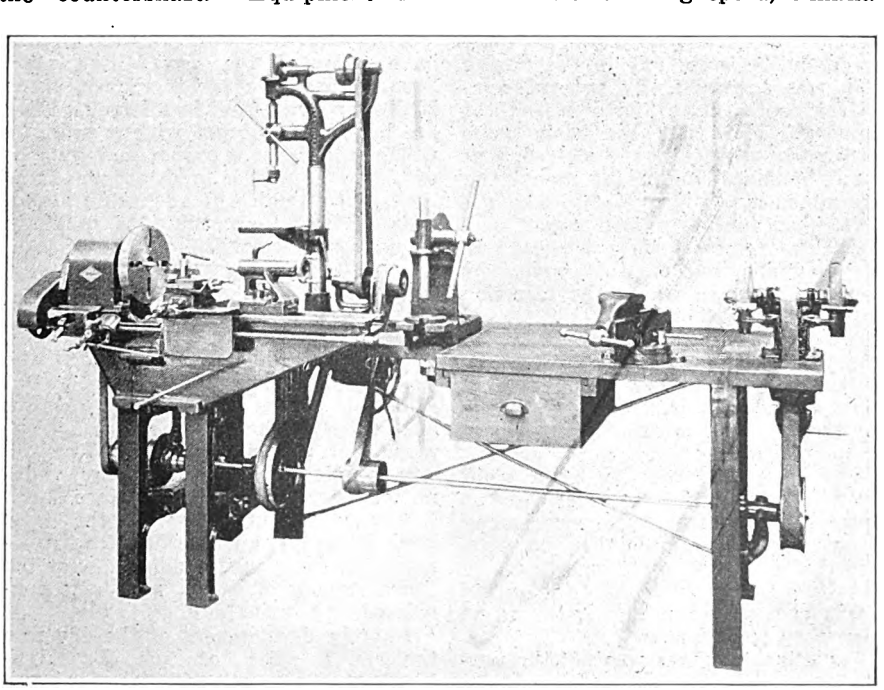
A GROUP of metal-working machines designed to handle the every-day jobs in a garage or small electric railway shop has been developed by the Artisan Manufacturing Company, Cincinnati, Ohio.

The outfit consists of a lathe, drill press, arbor press, vise and grinder head combined with a machinist's work bench. A ½-hp. electric motor is used to drive the machines, as shown in the accompanying illustration. Belt drive from another source of power is optional.

The bench has a hardwood top, 7 ft. x 30 in., with cast-iron legs bolted to it. The lathe has an 11-in. swing over the bed and is 24 in. between centers. It is controlled separately through a friction clutch on the countershaft. Equipment includes large and small face plates, chuck, five tools and four drop-forged lathe dogs. The drill press is rigidly fastened to the left side of the bench and is controlled through tight and loose pulleys. The drill has a capacity of 10 in. and the spindle can travel 3½ in. Table diameter is 8 in. The arbor press is located to the right of the lathe. It will take work up to 10 in. diameter, arbors up to 1¼ in., has a plunger movement of 8 in., a leverage of 36 to 1 and exerts a pressure of approximately 1 ton.

A 36-lb. machinist's vise is included. Its jaws are 3½ in. wide and open to 5 in. Two 6x1-in. emery wheels, one fine and one coarse, are mounted on the grinder at the right of the bench. A double-pulley idler is used to control its drive from a belt which ordinarily hangs loose. One rigid countershaft, running in three self-aligning babbitted bearings, drives all machines.

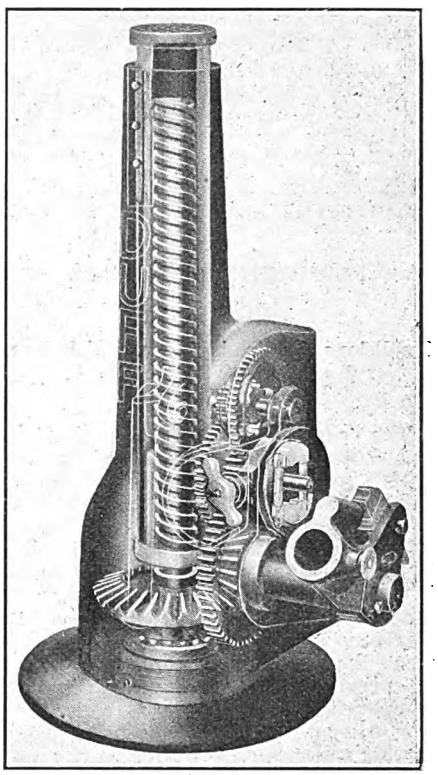
Crated for shipment, the outfit weighs about 1,000 lb. and is 7 ft. 6 in. long, 30 in. wide, 39 in. high.



This Combined Unit Has Six Metal-Working Machines

Lowering Speed Control Feature of New Jack

EMBODYING many features not previously used in jack construction, a new line of self-lowering jacks is being placed on the market by the Duff Manufacturing Company, Pittsburgh, Pa. These jacks range in capacity from 15 to 50 tons, and a special feature is the governor control which assures absolute control of the lowering speed, elimination of possibility of accidents through sudden or uneven dropping of the load, and provides a jack which may be slowed down gradually or stopped instantly at any point without shock or strain on the mechanism. The governor makes it possible in cases where two or more jacks are used together to provide a uniform lowering speed, so that one jack will not lower more rapidly than the other. This eliminates tipping or uneven lowering.



Self-Lowering Jack with Governor Speed Control

The new design has a drop-forged steel top and the standard is prevented from screwing out from under the load by use of an oversized key. A triple pawl holds the clutch with three drop-forged, heat-treated steel pawls. These hold and raise with each stroke. There is but one pawl on the lever socket. In the first position the pawl will raise the load in the usual manner. The second position is neutral. The third position is used for running the standard down without load.

A positive lock which also acts as a brake when lowering the jack gradually holds up the load. Thus, no dependence is placed on springs. A positive stop at the base of the standard prevents overextending the jack beyond the safe limit of the raise. A one-piece shell holds all working parts and bearings in an integral unit and assures perfect alignment of all parts.

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The News of the Industry

Springfield Report Presented

Conditions Outlined Under Which New Haven Road Is Prepared to Spend $1,500,000

The expenditure of approximately $1,500,000 in rehabilitating the Springfield Street Railway, Springfield, Mass., will be recommended to the board of directors of the New York, New Haven & Hartford Railroad. Vice-President E. G. Buckland of the railroad made it plain to Mayor Fordis C. Parker and the City Council on Feb. 25 that the company was prepared to proceed, provided the city will support the railroad in carrying out its program, including co-operation in obtaining state legislation to restore control to the railroad of this and other electric railway properties held by the New England Investment & Security Company, and that the city adopt recommendations contained in the report of the joint committee of survey. This committee comprised Clark V. Wood, president of the Springfield Street Railway; W. J. Flickinger, representative of the New York, New Haven & Hartford, and J. T. Battis Woodruff, representative of the city. The Mayor said he would call a meeting of the City Council to determine what course the city would pursue in relation to the conditions set forth.

Improvements recommended to be made include, among other things, the purchase of 50 new cars of the modern one-man type, an enlargement of the bus service, improved arrangements at the Main and Carew Streets carhouse to relieve street congestion due to the running of many cars in and out, double-tracking of Belmont Avenue as far east as Girard Siding and Sumner Avenue as far east as White Street, reduction of the number of car stops in certain cases, greater use of Dwight Street for cars now being routed through Main Street, and improvements of the roadbeds.

Recommendations of changes by the city include the widening of Belmont Avenue between Bellevue Avenue and Oakland Street, widening of Worthington Street between Chestnut and Federal Streets, widening of South Main Street, widening of Main Street between Railroad and Hampden Streets, opening of a new street between Walnut and Oak Streets, to relieve congestion in State Street; extension of Locust Street from Main Street to Columbus Avenue, removal of tree belts at street railway turnouts wherever the distance from rail to curb is less than 18 ft., fewer pedestrian crossings in Main Street and prohibition of all parking in Main Street from Liberty Street to Locust Street between 4.30 p.m. and 6 p.m.

The last-named recommendation, dealing with a question that for months past has been a subject of agitation, is opposed by the merchants. It appears likely to become the principal point of contention in the attempt to bring the parties to an agreement on matters covered by the report of the joint committee.

Survey on in Syracuse

A general planning survey of the city of Syracuse, N. Y., aimed to determine the best methods of eliminating grade crossings and improve general traffic conditions, is being conducted under direction of Frederick H. Fay, Boston expert in transportation and planning. Data have been presented by transit and other agencies, among them the New York State Railways, the Syracuse & Eastern Railway and the Auburn & Syracuse Railroad.

Benjamin E. Tilton, vice-president and general manager of the New York State Railways, reported on passenger and freight statistics for the corporation's Oneida line for 1925 and also for 1920. The number of passengers carried in 1920 was 643,403 and in 1925 the total was 412,717. A falling off in freight shipments also was reported. Harvey D. Gross, general manager, furnished similar data concerning the Syracuse & Eastern and Talmadge C. Cherry, president, on the Auburn & Syracuse line.

"Market Basket" Will Fix P.R.T. Wages

Purchasing Power of Dollar Is to Be Sole Factor in Wage Adjustments—Base Pay Reduced—Economists Heartily Approve Plan —Yearly Readjustment Except in Emergencies

EMPLOYEES of the Philadelphia Rapid Transit Company, Philadelphia, Pa., have accepted a reduction of 3½ cents an hour in their base pay, as a result of the recent "market basket" agreement adopted by joint action of employers' and employees' committees. Hereafter wages will be adjusted on a basis of the purchasing power of the dollar, so that employees will no longer be faced with the possibility of lowered living standards.

This unusual step was taken following a period of two years of intensive research work carried on by the men's own committees. The basic pay of 73½ cents an hour, which is 3½ cents less than the basic pay in use during 1925, was arrived at by general committees representing the men and the company. Hereafter the basic wage agreement will not be altered, the actual amount paid to the men being determined by an index figure which is based upon twelve typical market baskets. The prices of these baskets will be determined from month to month by a bureau working under the direction of the general committees.

To insure stability necessary to proper budgeting, adjustments of wages are not to be made more than once in every calendar year, except when the purchasing power of the dollar varies ten points or more from the market basket index and remains at a point beyond that variation for a period of at least three months. The purchasing power of the dollar shows no such sudden rise or fall in the past, save in time of panic or war inflation, when it was everywhere necessary to adopt emergency measures.

Reduction of wages was not the purpose for which the present decrease of 3½ cents an hour was adopted, the company announced. Rather it was felt desirable so to arrange the wage scale that a part of the employee's remuneration would be dependent upon his own operating efficiency. Provision is now made for a fee to management, based on gross earnings of the P. R. T. property, and payable only after the earning of a return to the owners. Part of this fee will comprise the management's compensation and expenses and part will go to the men in payment for their increased productive effort. Thus the employees will have opportunity for an ever-increasing enjoyment of the goods of this world as they increase their own value to the company.

A number of outstanding economists have approved the new Mitten plan. Among these are Irving Fisher, Jacob H. Hollander and W. Jett Lauck. They are heartily in accord with a program which will insure a proper maintenance of home standards and at the same time give promise of advancing standards of living according to gains in productive efficiency.

More Bus Applications in New York

Application has been made to the Board of Estimate of New York by the Equitable Coach Company to operate bus routes in all boroughs except Richmond. It was submitted on Feb. 26. The applications for franchises submitted by the Manhattan Surface Coach Company, a subsidiary of the New York Railways, and the Surface Transportation Company, a subsidiary of the Third Avenue Railway, were also considered the same day.

Another development of the day was the joint offer of the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad to under-

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take borough-wide bus operation in Brooklyn. In a letter to the Board of Estimate the presidents of the two companies declared their willingness to undertake the operation of a comprehensive Brooklyn bus system without giving any details. A definite offer will undoubtedly be made later and presumably the two companies will be willing to exchange some surface line franchises for bus franchises, as other companies owning surface lines have indicated a readiness to do.

The Equitable Coach Company is backed by the J. G. White interests. Its plea was regarded as presenting so many favorable features that Mayor Walker and his associates were said to have been considerably impressed, although, of course, the Board of Estimate members would make no decision on the granting of franchises until all the applicants have been heard.

Another feature of the Equitable offer, which was said to have appealed to the Mayor, was a provision for a 5-cent fare. This rate would be applied to a zone system, but the Mayor and his colleagues were informed that such a plan would benefit the short-haul riders, usually comprising the greater number of bus passengers.

The offer of the Brooklyn companies, signed by William S. Menden, president of the B.-M. T., and H. Hobart Porter, president of the Brooklyn City Railroad, read:

> In line with their obligation to give to the public the best possible transportation, the B.-M. T. Corporation and the Brooklyn City Railroad are prepared to form a bus company to be financed by them and to operate a Brooklyn borough-wide system of buses so to be co-ordinated with existing rapid transit lines and buses as to give to the public the best of service at the lowest possible cost.
>
> They therefore request the opportunity to confer with the members of the Board of Estimate to discuss terms upon which they may co-operate with the city through such proposed new corporation with city representation and supervision to insure co-ordination with existing lines and maximum service to the public. The operating experience on existing facilities of the B.-M. T. and Brooklyn City companies would seem to create the opportunity for agreement as to bus operations in Brooklyn on better terms than might be otherwise obtained.

Work of Expanding Chicago Rapid Transit Being Pushed

Service over the lines of the Chicago Rapid Transit Company to the additional west side communities of Maywood, Bellwood and Westchester is planned to start about May 1.

At present the terminus of the "L" service on the Garfield Park branch of the Rapid Transit Lines is at Des Plaines Avenue, Forest Park. As a result of the operating agreement, service will be extended westward over the Chicago, Aurora & Elgin Railroad to Bellwood and thence southward to Roosevelt Road, Westchester.

Excellent progress is being made in constructing the new track from Bellwood to Westchester. The roadbed has been completed, the tracks laid and third rail installed and three stations and an interlocking tower at Bellwood Junction are under construction.

Another important Rapid Transit Company development is the announcement of plans to construct a new terminal on Wells Street between Jackson Boulevard and Van Buren Street, Chicago, at an estimated cost of $160,000.

The new structure will serve as a terminal for the Aurora & Elgin, as well as furnishing increased loop facilities for the Rapid Transit Lines. It will be a three-story structure, embodying all the latest improvements for the comfort and convenience of the traveling public.

An innovation in station construction will be the placing of the waiting room of the third floor—the track level. A mezzanine will provide a women's rest room and a men's smoking room. On the first floor will be the ticket offices, a passenger concourse, telephone booths and concessions.

Construction work is expected to start early in April. Plans call for completion of the new terminal within six months from the time work is started.

They're at It Again

Phoenix Agitated Over Its Railway Problem—Visiting "Experts" See It a Financial One

Railway operation in the "great open spaces" may not be subject to the foibles of Old Man Weather, but nevertheless it has its problems. Particularly is this true where the destinies of the railway property are in the lap of the municipal government. Take Phoenix, Ariz., for example. The hue and cry which burst upon the normally quiet existence of that thriving community some time ago—contingent on the attempts of certain local citizens to allay the grievous ailments of the property without recourse to outside assistance—finally died away without any one's having so far forgotten himself as to resort to the faithful old "shootin' irons."

But the armistice was not destined to be long-lived. On the surface all was serene, but turmoil was beneath. The city fathers, gazing with mild distrust upon the efforts of their fellow citizens, began to cast about for some one who could tackle the local situation with the sangfroid of the cosmopolite. Nor was it necessary for them to search far. Within the bounds of their own fair domain were found two men who possessed the qualifications which the pilots of the local ship of state considered essential. They were Commander Abner B. Clements, U.S.N., retired, who is spending the winter in Phoenix, and J. Frederick Richardson, formerly prominent in various congressional investigations into aviation and Shipping Board conditions, who contemplates engaging in newspaper publishing in Arizona.

"Ah, ha," said the promulgators of Phoenix laws, "Here are the men who can solve our knotty problem." Forthwith, announcements were made in the local papers to the effect that two eminent authorities on street railway affairs had at last been found to prescribe the hoped-for panacea for the city's transportation ills. This investigation, furthermore, was to cost the city not one red cent, since the two gentlemen, acting in a most generous mood, had been kind enough to donate their services.

After a cursory examination of the task in hand, Commander Clements and Mr. Richardson informed Mayor Jefferson that the street railway situation was not a transportation problem so much as a financing problem.

No sooner had this announcement been made than more pyrotechnics became visible over the Phoenix horizon. A committee of citizens waited upon the city commissioners and delivered themselves of certain pertinent remarks. They professed to be much interested in the reasoning which led to the choice of a former navy man and an authority on aviation and Shipping Board affairs as experts on street railway conditions in arid Arizona. Said they: "These men have reported things to you about a system which you have known for years—that what is wrong with the street railway situation is a financial rather than a railway problem." Great was the professed astonishment of the committee at the conclusions at which the eminent investigators had arrived.

Since, after all, the investigation was costing them no money, the citizens' committee was moved once again to discuss things by word of mouth, rather than with the once popular "persuaders" of the wild 'n' woolly west, so nary a drop of any man's blood was spilled in the Council chamber that morning. Things are now in a simmering stage once more, while the investigators proceed to "investigate" in unruffled fashion. It is noteworthy that the central theme of discourse among the members of the City Commission whenever railway affairs are mentioned seems no more to deal with ways and means of disposing of the property to private interests, but rather with ways and means of making the railway every day and in every way a better municipal property.

Commission Approves Conowingo Project

The Philadelphia Electric Company's petition for approval of the Conowingo project, a $52,200,000 hydro-electric development along the Susquehanna River in Maryland, was allowed recently by the Public Service Commission of Pennsylvania. The decision followed a series of hearings in Philadelphia extending over several months. The testimony also was reviewed by the Public Service Commission of Maryland and a representative of the Federal Power Commission.

The Philadelphia Rapid Transit Company, Philadelphia, Pa., single largest user of Philadelphia Electric current, said that the financial set-up was calculated to increase in rates to consumers. This company's contentions in the main were upheld by the commission, and the Philadelphia Electric Company shortly thereafter complied with the commission's ruling.

Recently the commission received a formal communication from the Philadelphia Rapid Transit Company that, inasmuch as the revisions made in the petitions complied and dispensed with its objections to the Conowingo project, the objections were formally withdrawn.

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Electric Road Wins Switching Case

In a decision by Justice Brandeis, the United States Supreme Court on March 1 upheld an order issued by the Interstate Commerce Commission directing that three steam railroads cease discrimination against the Chicago, Lake Shore & South Bend Railway, an electric road operating between South Bend, Ind., and Kensington, a station within the limits of Chicago, in the matter of switching arrangements at Michigan City, Ind. The decision upheld that of the federal district court in dismissing a petition for an injunction against the I.C.C. order sought by the steam railroads.

Originally, the Lake Shore secured an order against the Lake Erie & Western, with which it has physical connection at Michigan City, to remove unjust discrimination for refusal to establish joint through rates and to make switching arrangements. The Lake Erie removed the discrimination by making the arrangements with the Lake Shore.

The Chicago, Indianapolis & Louisville, the Michigan Central and the Père Marquette, all of them steam railroads, also enter Michigan City, but they were not parties to the original action. When unjust discrimination was alleged against them and an order was issued by the I.C.C., they sought an injunction, alleging they had no physical connection with the electric road, that the latter was not essentially a freight carrier and that it has little equipment to exchange with them. The findings of fact of the Interstate Commerce Commission were assailed. The district court refused to grant the writ to the steam railroads. This decision is upheld by the Supreme Court. As a result reciprocal switching arrangements between the steam railroads and the electric line must be established at Michigan City.

Accident Faker Gets Two-Year Sentence

Another accident faker has been brought to book. He is known as Harry Peters. It is said that in a period of about a year he had operated against about thirty railways. That is important, but not quite so important as are his apprehension and subsequent sentence at Elizabeth, N. J., on Feb. 15 to serve a two-year term in prison.

On Jan. 16 the Public Service Railway, Newark, N. J., caused the arrest of Peters (of 1435 N. 29th Street, Philadelphia, Pa.) on the charge of obtaining money under false pretenses from the railway at Elizabeth, on Oct. 7, 1925. On Oct. 6 he was a passenger in a one-man car in Elizabeth and occupied a seat in the rear of the car. An electric light bulb broke. Peters alleged that it had fallen out of the socket, broken, and that the glass had got into his right eye. He was taken to a doctor, who treated the eye, and the railway representative at Elizabeth settled with him for $100. It was then discovered that he had obtained $75 in a similar manner at the Camden office of the company on Sept. 15, 1924, on account of an alleged accident. He at that time gave the fictitious address of Seventh and Penn Streets, Reading, Pa. In each instance he represented himself as being in the long-distance trucking business.

It has since been learned that he operated against the New York Railways and the Third Avenue Railway, New York City; the United Railways & Electric Company, Baltimore, Md.; Philadelphia Rapid Transit Company, the Morris County Traction Company, Morristown, N. J.; the New York, New Haven & Hartford Railroad, the New York Central Railroad, the Erie Railroad, the Baltimore & Ohio Railroad and the Lehigh Valley Railroad.

New Agreement in Chicago Under Discussion

With eleven months of Chicago's car franchises remaining to run, politicians are pulling in many directions and getting nowhere in particular toward working out new agreements. Heretofore there has been the practically unanimous ground of a unified system of surface and elevated lines with a subway, but for the first time a proposal has been made to submit separate ordinances. The Mayor, attacked on all sides, has practically stepped out of the negotiations.

A sub-committee has completed the draft of what it hopes will become the City Council's traction ordinance policy.

Cost plus is one item. A committee of engineers would fix the maximum and minimum figures of the fare fund, determining increases or reductions.

The Surface Lines would continue to pay 55 per cent of its net receipts to the city.

Home rule would be provided by the creation of a commission of five to take over the state commission's responsibilities in Chicago.

Extensions would be built on the basis of gross revenues. A percentage, undecided, would be fixed as the annual outlay.

The report recommends unification of all the lines.

The franchises would be based on the terminable permit principle.

Traction flared up freshly as a political issue by charges of Alderman Arthur F. Albert that a political faction was dictating the future of transportation in the state. He mentioned Senator Richard J. Barr, author of a terminable permit bill in the last Legislature that is to be made the basis of legislation offered to the next assembly. He said:

> The gang that controls the sanitary district has the nerve to shout "home rule" as a platform. The trustees are in a close alliance with the arch foes of home rule and if they get their candidates across Chicago will never have another thing to say about its own streets in the future.

One-Man Car Service in Milwaukee Put Off

The long-heralded installation by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., of one-man car service on its Walnut Street line has been temporarily suspended because the commission is anxious to have the facts and figures presented at the public rehearing in Milwaukee on the matter before a new and final order is issued. So far as the railway is concerned it planned to start the new service on March 1 in accordance with an order issued several weeks ago by the Railroad Commission.

The new order will be issued probably within two weeks and may provide for a trial test of one-man car service in order that claims of both advocates and opponents may be fullly tested. This trial may be conducted by operating one-half of the cars with a one-man crew and the remaining cars with two-men or otherwise by operating all of the cars, except during rush-hour specials, with one-man crews for a certain period. By operating one-half of the cars with one man, members of the commission brought out that the contention of the railway that these cars can maintain satisfactory schedules can be tried out. S. B. Way, president of the company, said:

> The company is confident that actual operation will demonstrate the improved service possible only with one-man cars of the type the company is required by the commission to furnish and that the fears of the comparatively small number of people who have so far expressed themselves will be found groundless.

Electric Road Planned for Florida

It is planned to build an electric railway to link up Central Florida cities with the East and West Coast and open up the great ridge and lake sections of interior Florida. To this end a corporation to be known as the Florida Service Electric Railways will be formed with a capitalization of $10,000,000. The road is to be built in separate units. The first will run from Orlando through Apopka and north to Palatka. The second unit would extend from Orlando to Tampa and St. Petersburg and the third unit through Sanford to Daytona Beach and ultimately link up with Jacksonville to the north, with Miami as its southern terminal. Orlando's location, geographically the heart of Florida and the greatest center of central Florida's population, is believed to be the most desirable from which to operate. Officers of the Apopka Chamber of Commerce have the matter in hand for promotion.

Question of Public Control Renewed in Boston

Considerable discussion is developing over the proposition whether the public operation of the Boston Elevated Railway, Boston, Mass., should be extended for a period of 30 years, as was proposed by the special legislative commission. One of the factors entering into this recent discussion is the Boston Chamber of Commerce. That body has voted to indorse the proposition and has sent a communication to this effect to the legislative committees on street railways and metropolitan affairs. The Chamber of Commerce concludes it is for the best interest of the car riders and the community that public control of the Elevated be maintained for at least 30 years more, as this will pave the way to obtain capital and permit service to be improved. At the same time the chamber favors the general policy that public control ought to be only a temporary expedient.

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Eight-Hour Bill Killed in Massachusetts

The Massachusetts trolleymen's eight-hour bill has been defeated in the Legislature by a vote of 18 to 10. Senator Frank B. Phinney, Dorchester, opposed the bill on the ground that it would place a restriction on business. He charged the bill was an attempt to increase the pay of the employees, who hope to get nine hours pay for eight hours work. Senator Gifford, Salem, who favored the bill at its inception, voted against it. He felt that neither the public nor the railways was in a position to stand the extra expense it surely would involve.

J. N. Shannahan Honored by Employees

If John N. Shannahan, retiring president of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., ever had any doubt of the affection in which he was held by the employees of that system and the esteem in which he is held by the people of the Virginia Peninsula, it was dispelled recently when tribute was paid to him by the employees who have been under him during his fifteen years as head of the system. Men and women expressed in terms stronger than mere words their implicit faith in him. As a climax Mr. Shanahan was presented a testimonial handsomely bound in leather, engraved with his name in gold on the back, containing the personal signature of every officer, director and employee in the system.

Holyoke Power Agreement Case Postponed

The Turners Falls Power & Electric Company, the Holyoke Water Power Company and the Holyoke Street Railway have virtually come to an agreement for the settlement of the controversy raised by the petition of the first-named company to the Massachusetts Public Utilities Commission for a franchise to enter the city of Holyoke to connect and operate the power house to be purchased from the railway as part of a general contract to sell energy to that company. Under the plan now awaiting final adoption the Turners Falls company will withdraw its petition and the Holyoke Water Power Company will supply energy for the power house, on condition that the Holyoke Water Power Company shall buy from the Turners Falls company an amount of energy equivalent to that sold by the Holyoke Water Power Company to the railway. The car company will pay to the Holyoke Water Power Company the same price for energy it would have paid to the Turners Falls company under the arrangement proposed but not approved by the State Department. The Turners Falls company will take over the car company's power plant for $400,000, as previously agreed, and will then convey it to the Holyoke Water Power Company for a market value to be determined.

The Public Utilities Commission had called a rehearing on the petition for March 1, but it granted a postponement to March 22, on assurances that an agreement had been reached on many of the details. Since the original hearing last year the personnel of the commission has changed.

New Jersey Governor Against Federal Rate Interference

Governor Moore of New Jersey has called on the Legislature to petition Congress to enact legislation to limit the jurisdiction of United States courts in the regulation of public utility rates within the states. It is his opinion that the practice of public utility companies in rate cases of applying to the federal statutory court for injunctive relief has been carried on to such an extent in recent years as practically to oust the state of its jurisdiction in the regulation of rates of such companies. He says that the problem of regulation of the service and rates of such companies should be solely within the state's jurisdiction. The Governor said:

> I believe it is an undue interference of the federal statutory court to intervene in the matter of regulation of rates of the companies of the state. This is now done by immediate application for injunction to the federal courts, the effect of which is to suspend immediately the rates of such companies as determined by the board upon a hearing after notice, and after full consideration of all matters necessarily and properly considered in rate cases, and thereby makes futile the effort on the part of the state to regulate the rates of utility companies which exist by virtue of a charter given them by this state.

Everman Plan Accepted in Dallas

The recent Everman recommendation, the basis of which was to increase the fare of the Dallas Railway, Dallas, Tex., to 7 cents, with the provision that five tokens could be purchased for 30 cents, has been accepted, with a few minor changes, by the directors of that company.

The passage of the ordinance has been delayed a few days due to the fact that J. J. Collins, city attorney, who is to supervise the preparation of the ordinance, has been sick. Those closely in touch with the situation feel that if the city attorney's condition will permit a conference will be held at a very early date and the ordinance will be passed without delay virtually as recommended by Mr. Everman, supervisor of public utilities for the city.

The railway, the populace and the officials of Dallas are in agreement on this new program, which will provide funds to make extensions and purchase additional equipment urgently needed.

Obsolete Cars Burned in Spokane

Thirty-six street cars, worn-out and obsolete, have been consumed by the flames in a series of bonfires held under the direction of G. H. Darby, master mechanic of the Spokane United Railways, Spokane, Wash.

The cars were stripped of all worth-while material and were then tipped off their trucks. The trucks were dismantled while the old car bodies were soaked with oil and burned.

Transit Bill for New York Reported Favorably

The Senate Judiciary Committee on March 2 reported favorably Senator Nicoll's constitutional amendment authorizing New York City to increase its debt after Jan. 1, 1928, to an amount not exceeding $300,000,000, said increase to be used for the construction or equipment, or both, of new rapid transit lines. The debts so incurred are not to be included in computing the city's debt limit.

Messrs. Sawyer and Eales Arrive in Australia

Cablegrams from Sydney, Australia, tell of the safe arrival there of W. H. Sawyer, president of the East St. Louis & Suburban Railway, East St. Louis, Ill., and H. W. Eales, chief electrical engineer of the Union Electric Light & Power Company, St. Louis, Mo., who have gone to Australia to conduct a survey of power there for the Victorian government.

Omaha Franchise Ordinance Introduced

The street railway committee of the City Council of Omaha, Neb., has made its report to the committee of the whole. The report of the committee was adopted at this meeting and the city attorney instructed to prepare an ordinance in favor of the Omaha & Council Bluffs Street Railway embodying the terms and provisions recommended by the committee. The measure has since come up on first reading. It seems probable now that the matter will be ready for submission to the voters of the city some time this spring.

Three Railway Systems Connect in Wisconsin

Three of the largest electric railway systems in Wisconsin have been interconnected at Sixth and Clybourn Streets, joining the Chicago, North Shore & Milwaukee Railroad, Milwaukee, Electric Railway & Light Company and the Milwaukee Northern Railway. An interchange of express cars running from Chicago on the North Shore to Milwaukee and then west to Waukesha, Oconomowoc and Watertown on the Milwaukee Electric Railway line, or north to Sheboygan on the Milwaukee Northern, and vice versa, is thus made possible. Arrangements will be made to handle the exchange on excursion trains.

Hearings on Syracuse and Utica Fares on March 10

The Public Service Commission of New York will hold a hearing at Albany on March 10 on the petition of the New York State Railways for permission to charge a 10-cent cash fare or 7½-cent ticket fare in Syracuse and vicinity. A second hearing on the petition of the company for permission to charge an increased fare in Utica and vicinity will also be held on March 10. The Utica proceeding will be conducted in the morning. That on Syracuse will be held in the afternoon.

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News Notes

Wage Increase in Sacramento Under Consideration.—Employees of the Pacific Gas & Electric Company, Sacramento, Cal., have petitioned for a wage of $6 for nine hours work with time and one-half for overtime. The present pay is on an hourly basis starting at 51 cents for a beginner and reaching 60 cents for a one-man car operator who has been employed by the company for more than one year. E. W. Florence, division manager of the company, said that the request of employees for more pay would be considered.

Special Review Number at Vancouver.—The British Columbia Electric Railway, Vancouver, B. C., Canada, has issued a special review number of its employees' magazine dated March, 1926. The early development and progress of the company are described by means of entertaining reading, attractive pictures and instructive charts. The March issue contains nearly 50 pages.

Commuters' Rates Out of Louisville Advanced.—The State Railroad Commission has granted the Louisville Railway permission to advance commuters' rates on all of its interurban lines out of Louisville, Ky., operated as the Louisville & Interurban Railroad. This will result in about a 21 per cent increase in ticket books, with no change made in basic rate on cash fares, which is 3 cents a mile. The commutation rates range from seven-tenths of a cent per mile to 1½ cents a mile. About three months ago rates were raised within the city of Louisville by 1 cent and ½ cent on school books. The company had endeavored to discontinue commutation books entirely, but the commission refused to grant the discontinuation. There are seven lines operated out of Louisville, including the Orell, Prospect, Lagrange, Shelbyville, Okolona, Fern Creek and Jeffersontown.

Jitney Permits Still the Issue in Tacoma.—Efforts of Mayor A. V. Fawcett of Tacoma, Wash., to have further permits granted for jitneys which will run in competition with the Tacoma Railway & Power Company have been blocked by the City Commissioners, who favor holding off such permits until the new Council is seated in June. The new men who will become councilmen have announced that they will endeavor to solve the transportation problem, and City Commissioners do not wish to complicate the situation by granting further permits for jitney lines.

Former Application Renewed in Wheeling. — The Wheeling Traction Company, Wheeling, W. Va., has filed a petition with the Public Service Commission to reopen its former application for increased rates, which the commission recently denied. The company declares it has new evidence to introduce in the case. However, no date has been set for a hearing. In a recent application the company sought permission to sell nine tickets for 50 cents, instead of the customary ten for the same amount. The proposition was rejected, as figures advanced for consideration were said to have taken in interstate rates. If another hearing is granted, figures concerning the operation of cars only in the West Virginia side will be placed before the commission. The application was filed by H. L. Mitchell, vice-president of the Wheeling Traction Company.

Safety Isles Planned. — The United Railways, St. Louis, Mo., in co-operation with the St. Louis Board of Education and the Police Department, will construct concrete isles of safety at several avenues. The St. Louis Board of Public Service has been requested to issue permits for the placing of the isles in the streets. The St. Louis Street Department had no funds available for this work so the United Railways donated $1,500, the Board of Education $1,500 and the police $500 to install the isles and protecting "blinker" traffic signals.

Changes at Colorado Springs.—The fare on the cars of the Colorado Springs & Interurban Railway has been reduced from 10 cents to two tickets for 15 cents in that city. The "pass system" has been eliminated. At the same time rail operation was discontinued on the Wahsatch lines and buses started.

Weekly Pass for Greensburg, Pa.—The West Penn Railways added a $1 weekly pass for the one-zone area covered by a cash fare of 8 cents or a ticket fare of 6¼ cents effective March 1. The application is for an experimental period ending May 30, 1926. This is the second weekly pass on the coke region lines of the West Penn Railways. The first was the similar $1 pass at Connellsville, in use since June 1, 1925. The Kittanning & Ford City division, West Penn Railways, installed four multi-zone passes Sept. 20, 1925.

Do You Want a Woman's Page?—In order to test out the interest in a woman's page as a new feature of the *Southern Public Utilities Magazine*, the Southern Public Utilities Company, Charlotte, N. C., is offering three prizes of $5, $3 and $2 respectively for the three best woman's pages submitted. The editor, John Paul Lucas, is interested in knowing if the women readers would co-operate in making a woman's page really worth while and valuable.

Senate Committee Kills Public Service Inquiry.—The committee on finance of the Senate of Pennsylvania has killed the Barr resolution calling before the Senate members of the Public Service Commission to give testimony respecting the decision on the Philadelphia Rapid Transit Company fare case.

Recent Bus Developments

Bus Operation Now Ruled by Arkansas Board

Regulation of buses has been assumed by the Arkansas Railroad Commission under its general authority over common carriers authorized by the railroad commission act of 1921. Its action has been upheld by the Attorney-General. A set of rules and regulations governing bus operation was put in effect on Jan. 1.

This provides that operators of buses must obtain from the commission a revocable certificate of convenience for each route. Operators in business at the time of the adoption of the regulations shall be granted a certificate upon showing that they have complied with the regulations. There must be filed with the commission time schedules, showing rates, mileage and towns on the route. Buses must be maintained in a sanitary condition, heated in cold weather and properly lighted.

Bonding or insurance against accident liability is required. The largest bond is for $50,000 for buses over 20 passenger capacity. Damages to one person are limited to $5,000. Bonds of $1,000 are required for the protection of property. Establishment of a central depot by each company is required. All buses of more than five-passenger capacity must carry a fire extinguisher.

Taxicabs, hotel buses, school buses, sightseeing buses, real estate buses and buses used in private business only are exempt from the rules, as are also buses operating exclusively within the limits of a municipal corporation and other municipalities contiguous thereto.

As mentioned before, no special law has been passed providing for the regulation of buses. Because of this, court action involving the authority of the commission seems likely.

Commission Approves Sale of Bus Routes to Tractions

Approval has been given by the Public Service Commission of Indiana to the sale of all but two of the remaining routes of the Indiana Red Ball lines and the routes of the Hoosier State lines to the Union Traction Company and the Indiana Motor Transit Company, a subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company. Only six other independent lines will be in operation out of Indianapolis when the sales are completed. In the order approving the sale, the commission prohibits the purchasing companies from capitalizing the $32,788 paid for operator's certificates.

The T. H., I. & E. subsidiary is to buy Red Ball certificates to Richmond, Lafayette, Crawfordsville and Martinsville for a consideration of $15,000, excluding equipment. The Union Traction Company is to buy certificates on the Red Ball's routes to Sheridan and Noblesville for $2,400. The Rockville certificate will be sold to Platter & Baldwin for $1,388. Union Traction also is buying the Hoosier Stage line certificates to Muncie and Marion for $14,000. Fred I. Jones, receiver of one of the bus lines and sponsor for the others, declared the sales were made to prevent dissipation of remaining assets.

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New Feeder Line in Toledo

The Community Traction Company, Toledo, Ohio, on Feb. 16 started the operation of a feeder bus on Glendale Avenue and Wildwood Road, in the southern section of the city, an extension of the Broadway line, under a new plan of lease direct from the manufacturers with option to purchase. The bus, has a seating capacity of 25. It was furnished by Mack Trucks.

Other feeder buses are being leased from independent operators. The City Council in providing for feeder bus operation denied the right to the company to spend any money to purchase buses, but forced it to lease. It is felt that a change in this policy may result soon following establishment of other lines and their operation at a cost of about twice the revenue collected on them.

Bus Lines at Gary in Separate Company

The Shore Line Motor Coach Company has been formed by Insull interests to take over various bus lines formerly operated as feeder and auxiliary services by the Gary Railways, Gary, Ind. The bus lines radiate from Gary, Ind., and may be extended. The bus line probably will be controlled by the Midland Utilities Company.

Greater Authority Over Buses Wanted in New York

To the New York State Public Service Commission "it seems apparent that the substitution of buses for trolley lines which have ceased to be profitable or in territories which may better be served by buses is inevitable." In discussing the future of bus operation in its report to the Legislature the commission sees the need of an adequate inspection force and the need for further authority for the regulation of the buses. That body said:

> The close of the year finds the bus lines just beginning to function at their best. In the next season there is every reason to believe there will be a further consolidation with wider extensions which will ultimately provide the state with a class of service of the first order. The development of these routes logically follows the completion of state highways. The present comprehensive system of highways invites the establishment of more extensive and better equipped lines.
>
> With the continued growth, the amount of business carried by bus lines in this state, the need for further authority for the regulation of these agencies is constantly apparent. This commission has made recommendations upon this subject in former reports. In the opinion of the commission there should be added to the present public service commission law an article specifying in detail the supervision which the Legislature desires the commission to exercise over bus lines. The law now contains such an article covering every other class of utilities over which the commission exercises regulatory powers. The necessity for legislation upon this subject is recognized not only by the commission and the general public but also by the operators of bus lines. The preparation of proposed bus legislation should have the active co-operation of all interested parties. It is the earnest hope of the commission that adequate bus legislation may be enacted at an early date.

Two other recommendations upon this subject contained in the last annual report of the commission are again renewed, namely, an amendment to Section 5 of the public service commission law specifying more in detail as to the authority of the Public Service Commission and the Transit Commission where a bus line is partly within and partly without the territorial limits of the city of New York, and an amendment of the railroad law which will permit street railways to engage in auxiliary bus transportation business without the necessity of forming separate corporations for that purpose.

New Bus Viewed in Portland, Ore.

A party of railway officials of the Seattle Municipal Railway, Seattle, Wash., City Councilmen, bus representatives and traction men recently spent two days in Portland, Ore., studying the operation of bus lines as feeders for railway lines as worked out by the Portland Electric Power Company. Interest was especially keen in a new parlor observation type stage for service between Seattle and Everett. The new type was evolved by the Pacific Northwest Traction Company. A feature of the bus is an observation cupola at the rear, accommodating twelve passengers. The cupola is raised 5 ft. to insure an unobstructed view.

Permit Sought for Extended Service.—The Key System Transit Company has applied to the California Railroad Commission for a certificate of public convenience to operate bus service between Oakland and Hayward.

Program of Rehabilitation Under Way. — Immediate extension of the Rockford City Traction Company service at Rockford, Ill., has been announced by Adam Gschwindt, receiver of the company, who has purchased six new buses for immediate use. The buses are taken under lease from the Yellow Truck & Coach Manufacturing Company with a view to their purchase. This indicates a policy of the receiver to attempt rehabilitation of the lines by adequate service to the public. There are now ten buses in service.

Bus Application Under Advisement.—The Illinois Commerce Commission has under advisement the application of the East St. Louis & Suburban Railway, through the Alton, Granite & St. Louis Traction Company, to operate a bus line between Alton, Ill., and St. Louis, Mo., via Brooklyn, Venice, Madison, Granite City, Nameoki, Mitchell, Hartford, Woodriver and East Alton. At the hearing on the application in East St. Louis, Ill., representatives of the Illinois Traction System and the Alton & Woodriver Bus Company objected to the new buses accepting local fares in the territory now served by the Illinois Traction and the Alton & Woodriver Bus Company.

New Scale of Fares on Bus Lines.—For convenience of passengers on the Sylvan Hills and Atlanta Avenue bus lines of the Georgia Railway & Power Company, Atlanta, Ga., who desire to use only the buses, the fare has been reduced from 10 to 5 cents. No transfers to streets cars are given with 5-cent fares. The change in no way affects the arrangement by which 10 cents is charged for combination bus and car rides. Previously a straight 10-cent fare was charged, with street car transfers issued if desired. Now the charge will be 5 cents for all except those who desire to continue their journey by street car. For those transferring from street car to bus, a 3-cent charge, in addition to the 7-cent street car fare, will continue to be in effect.

New Lines Out of Springfield Planned.—The Illinois Traction System will shortly apply to the Illinois Commerce Commission for certificates of convenience and necessity for the operation of a number of intercity bus lines radiating out of Springfield, Ill. The new bus lines will be supplementary to the present interurban lines operated by the company.

Buses Desired on Five-Mile Line.—The Willapa Electric Company, operating the electric railway between Raymond and South Bend, Wash., has appealed to the State Department of Public Works for permission to discontinue the line and substitute buses. J. R. Snider, manager of the company, expresses the opinion that the line, which is now losing money, may be made profit-earning by the substitution of motor equipment. It is proposed to purchase three buses, each seating twenty or more passengers. The car tracks will be torn up and the equipment sold. The line is 5 miles long.

Seeks to Replace Car Service.—The Menominee & Marinette Light & Traction Company has petitioned the City Council of Marinette, Wis., for permission to replace street car service with bus service, on a trial basis at least, on its unprofitable Hall-Pierce Avenue line. If the Council approves of the change a similar fare will be charged, with transfer privileges for bus and railway patrons.

Three Lines in Akron Approved.—After twice refusing to permit the Northern Ohio Traction & Light Company, Akron, Ohio, to operate express buses at a 10-cent fare the City Council has passed an ordinance sanctioning three such lines. The first will be an extension of the 10-cent express line that has been running from Cuyahoga Falls on the north to South Main and Cedar Streets, with no stops in Akron. Stops will be permitted at points to be selected by the city safety director. Free transfers will be issued from express buses to other buses or street cars. A 3-cent transfer will be issued from street cars to regular or express buses. Express bus stops will be regulated by the city safety director.

Wants Buses Substituted.—The Denver & South Platte Railway, operating the electric railway from Englewood to Littleton, Col., about 6 miles, has asked the State Public Utilities Commission for permission to abandon its tram cars and to substitute buses. The reason for the change is an economical one, the railway failing to pay. The matter is under advisement. To carry out the bus features the company has incorporated the Denver & South Platte Transportation Company, capitalized at $25,000. H. W. Hartman is one of the incorporators. The city fathers of Englewood wish to pave South Broadway, but say that the work will have to wait the outcome of the railway's move to abolish the cars. The cars have been operating eighteen years.

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Financial and Corporate

Last Details Under Way

Final Moves Being Made in Kansas City Railways Receivership Sale Case

At the continued hearing on Feb. 24 on the confirmation of the sale of the Kansas City Railways property, Blatchford Downing, attorney for the second mortgage bondholders, was permitted to take depositions in the case before a notary public. Mr. Downing had previously contended that such depositions should be legalized for the occasion. Powell Groner, attorney for the Newman syndicate, purchasers of the property under foreclosure sale, said a special commission should be appointed for the purpose. Mr. Downing will begin taking the depositions on March 9 in New York City and will then go to Washington, Detroit and Chicago to obtain further statements from other parties resident in these cities.

Frank P. Sebree, attorney for the stockholders of the defunct railway, expressed the wish to ask Mr. Newman how much his interest in the first mortgage bonds had cost him.

Judge Stone was requested by R. J. Higgins, attorney for the trustees, to eliminate that part of Mr. Sebree's objections. Mr. Newman's own attorney, Powell Groner, said his client is willing to meet any and all queries, but Mr. Groner intimated that the price paid for the bonds by Mr. Newman is of no concern to any one else. Decision in the matter of the elimination of such questions was reserved, but a remark attributed to the court appears to indicate that this line of attack will be futile in so far as the court is concerned.

The Newman syndicate is credited with having offered the holders of the second mortgage bonds a settlement of 20 cents on the dollar, but the offer was refused. Mr. Groner expressed the doubt that all of the holders of second mortgage bonds understood the liberal terms which had been offered them and rejected. It was also intimated that Mr. Groner plans to make some depositions for his own side of the case while he is in New York.

In speaking of the offer that his clients had rejected, Mr. Downing said that his clients always had a hand outstretched to receive a plausible offer, but they had always discovered that the reorganization managers were trying to lure them around the corner on one pretext or another.

Judge Stone expressed regret that proceedings are being prolonged. He set April 12 as the date for a hearing on the depositions and the grounds for other objections.

Attorneys in the case were urged to arrive at some agreed valuation of the property, so that the adequacy of Mr. Groner's bid of $8,000,000, made at the sale under foreclosure, might be argued intelligently.

On Feb. 25 the Kansas City Public Service Company was granted permission to operate in Kansas as a Missouri corporation. Simultaneously the Wyandotte Railways was chartered to own the railways properties in Kansas City, Kan.

The most recent action of the charter board removes one of the last remaining obstacles to the operation of the railways properties in Kansas, although the delay of the hearing on the confirmation of the foreclosure sale augurs for the elapse of some months before the public service company shall have the actual operation of the property.

Chicago, Aurora & Elgin Corporation Sold—New Officers

Thomas Conway, Jr., and associates of Philadelphia have sold to Samuel Insull and associates of Chicago their stock holdings, constituting a majority in interest, in the Chicago, Aurora & Elgin Corporation, which in turn controls through stock ownership the Chicago, Aurora & Elgin Railroad, owning and operating a high-speed electric railroad serving the western suburban districts of Chicago.

At a meeting of the board of directors of the Chicago, Aurora & Elgin Corporation, held in Philadelphia, Alba B. Johnson, Samuel B. Stinson, A. E. Pfahler, Gordon B. Anderson and E. C. Faber resigned as directors of the Chicago, Aurora & Elgin Corporation, and Samuel Insull, Britton I. Budd, R. Floyd Clinch, B. J. Fallon, J. H. Gulick and G. R. Jones were elected as their successors. At the request of Mr. Insull, Mr. Conway has consented to remain a director of the holding company for the time being. Lewis B. Williams, Cleveland, and A. B. Conant, Boston, also continue as directors.

As soon as the necessary corporate action can be taken, Mr. Conway and his associates will retire as officers and directors of Chicago, Aurora & Elgin Railroad Company. J. H. McClure will retire as vice-president and general manager and will go to Dayton, Ohio, as the operating head of the Cincinnati & Dayton Electric Railway, which is about to be taken over by Mr. Conway and associates.

Another Step Nearer Foreclosure in St. Louis

United States District Judge Faris has ordered the St. Louis Union Trust Company, trustee under the mortgage securing the $30,300,000 general 4 per cent bonds of the United Railways, St. Louis, Mo., to issue an additional $6,000,000 of such bonds to the reorganization committee through Receiver Rolla Wells to be exchanged for $4,100,000 in underlying bonds and $1,900,000 in cash. The unissued portion of the general 4s, totaling $3,700,000, will be canceled. The order by Judge Faris paves the way for Receiver Wells to complete his contract with the reorganization committee. This provides that Mr. Wells shall use the $1,900,000 cash received for the new bonds and $2,300,000 funds now on hand to pay off $4,200,000 of receiver's certificates.

There is now only one more legal matter to be disposed of prior to the sale of the property at foreclosure. This is the presentation of unsecured claims.

Gary Railways on Dividend Basis

Operating revenue of the Gary Railways, Gary, Ind., in 1925 was $1,204,729, according to the annual report of the company made public on Feb. 24.

The Gary Railways is one of the operating subsidiaries of the Midland Utilities Company. It furnishes local transportation service in Gary, and operates lines connecting the steel manufacturing city with East Chicago, Hammond, Valparaiso and Hobart.

The name of the company was changed from Gary Street Railway to Gary Railways in August, 1925, and the properties of the Gary & Valparaiso Railway, Gary Connecting Railroad and Gary & Hobart Traction Company were purchased and all merged into one system.

Passengers carried by the company in 1925 totaled 15,597,784, compared with 12,527,906 in 1924. The month of December was the largest in the history of the company, 1,559,872 passengers being carried.

Preferred dividends paid during 1925 amounted to $7,662. Common dividends declared amount to $84,969.

The company obtained during the year a wide distribution of its class A preferred stock in the territory which it serves. A sale of this stock by employees under the customer-ownership plan began on Sept. 8, 1925, and ended Dec. 31, 1925. During this period 4,257 shares were sold, of which 3,036 were purchased by residents of the Calumet district of northwestern Indiana in which the company operates. A large number of such shares were sold on a

INCOME ACCOUNT OF THE GARY RAILWAYS

	1925	1924
Operating revenue	$1,204,729	$998,418
Operating expenses	927,693	773,289
Net operating revenue	$277,036	$225,128
Other charges, including taxes	88,176	73,813
Total income	$188,859	$151,315
Interest on funded debt	73,795	69,523
Net income	$115,064	$81,792
Dividends declared	92,631	.....
Balance to surplus	$22,432	$81,792

SURPLUS ACCOUNT OF GARY RAILWAYS

Balance Dec. 31, 1924		$269,306
Net deductions from surplus		82,668
		$186,638
Net income for year, as above	$115,064	
Less dividends declared	92,631	
		22,432
Surplus Dec. 31, 1925		$209,070

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monthly savings plan and were not issued at the close of the year. In the city of Gary 2,336 shares were sold to 1,442 subscribers. This was an average of 1.7 shares per subscriber. In the Gary Railways organization 92.58 per cent of the employees subscribed for stock.

Since 1918 $1,500,000 has been spent in modernizing the company's property. Track mileage has been increased 50 per cent in this interval, car equipment almost 200 per cent, power equipment 200 per cent and car mileage operated more than 100 per cent.

The Gary Railways was one of the first street railways in the country to adopt both efficient light-weight safety cars and trail trains. Auxiliary motor coach service has been established as a feeder to the regular railway service to "pioneer" into newly developed residential sections of the city where the population does not yet justify railway service.

The Gary Street Railway in 1918 carried 7,529,381 passengers. In 1925 15,597,784 were carried, or an increase of 107 per cent over 1918.

The gross revenue of the railway property in Gary increased from $385,579 to $998,418 in seven years.

The company operates its cars over 72 miles of track and 79 motor passenger cars and fourteen trailers are used.

The industrial zone within which the Gary Railways operates has a population of approximately 200,000 people. It is a territory that is growing rapidly and the Gary Railways has steadily increased its service and facilities for serving the public and to meet the demands of this industrial growth.

Two Long Island Properties Sold

The property of the New York & Long Island Traction Company was sold by former Lieutenant-Governor Wood, acting as referee in a foreclosure action brought by the Union Trust Company, Cleveland, on Feb. 25 in the Nassau County Court House at Mineola, L. I. Louis Carruthers, who represented a committee of the bondholders, bid $300,000 for the property as a whole. It was then offered in units. The bids for the units totaled $308,100.

The five franchises held by the town of Hempstead and the various villages went to the H. E. Salzberg Company, 50 Church Street, Manhattan. The remainder of the property was taken by the bondholders. There was some lively bidding for the real estate at Hempstead and at Rockville Centre, but the committee took it at $50,000 for each parcel. The committee also bought in the right-of-way over the route between Hicks Neck, west of Freeport, westerly into Rockaway Avenue, Queens, for $115,000.

The rolling stock, including 45 cars, was bought in by Mr. Carruthers for the committee at $11,250. The tracks, including 41 miles, and overhead equipment went to the committee, also represented by Arthur G. Peacock, counsel for the company, at $22,500. The machinery and office equipment went to the committee for $9,500. Mr. Peacock said the line would be abandoned, but he thought service would be continued until the buyers had taken title within 30 days and the courts had dismissed all proceedings.

The sale on Feb. 25 was followed on Feb. 26 by the sale of the rolling stock, buildings, equipment and franchises of the Long Island Electric Railroad. This property went to the American Community Corporation, a real estate concern of Brooklyn. The railway brought $115,000.

$98,196 Decrease in Net in Louisville

Automatic Increase in Fare Followed Reduction in Barometer Fund Below $200,000

All directors and officers were reelected by the Louisville Railway, Louisville, Ky., at the annual meeting of stockholders. Judge Alex P. Humphrey resigned as general counsel for the company. He was succeeded by his son Churchill Humphrey, who had been assistant general counsel. J. J. Blackerby became the employee representative on the board of directors. He is a trainman.

The statement of earnings for the year ended Dec. 31, 1925, compared with 1924 is shown in the table below.

The year 1925 was the third of operation under the ordinance which became effective on Sept. 17, 1922. The net result of three years operation was a reduction of the barometer fund from $350,000 to less than $200,000. As a result the automatic fare provision of the ordinance became effective on Feb. 1, 1926, and the fare was increased from five tickets for 30 cents and 7-cent cash fare to five tickets for 35 cents and 7-cent cash fare.

Passenger traffic during the early months of 1925 was somewhat lighter than for the corresponding period in 1924. The last three months of the year showed considerable gain in traffic, however, and the total passenger traffic, compared with the preceding three years was as follows:

1922	Total passengers carried	91,899,745
1923	Total passengers carried	97,670,397
1924	Total passengers carried	97,739,267
1925	Total passengers carried	97,134,565

President Barnes says the problem of the cars maintaining their scheduled time is becoming more and more difficult to solve. The number of automobile licenses issued in Louisville during the last four years was as follows:

	1922	1923	1924	1925
Trucks	5,551	6,250	7,400	8,083
Private automobiles	26,650	29,891	40,916	46,379
Motorcycles	.....	.....	235	247
Dealers	.....	.....	88	97
	32,201	36,141	48,639	54,806

In this connection Mr. Barnes says the elimination of jitneys would do much toward relieving congestion in the central part of the city and would give considerable additional revenue to the system.

By request of the Board of Public Works and of the Board of Safety, the first loading platform was put in service on Broadway at Fourth Street on Jan. 14, 1926. These loading platforms will be placed at transfer points on Broadway, the other loading points being protected by concrete posts. It is believed that they will be of considerable service to the car passengers and will also speed up automobile traffic on Broadway.

During the year 68 cars were vestibuled and equipped with rear doors and folding steps.

Power economies put into effect in 1923 and 1924 have continued to show good results. The comparative costs of power station operation and maintenance are as follows:

	1922	1923	1924	1925
Car-miles operated, system	13,283,844	13,934,309	14,071,118	13,749,956
Kilowatt-hours, system	51,293,156	52,709,508	53,914,663	52,723,099
Cost of maintenance and operation of power plants	$535,380	$514,843	$454,949	$414,818

COMPARATIVE INCOME STATEMENT OF THE LOUISVILLE RAILWAY

	1925	1924
Operating revenues:		
Revenue from transportation	$4,239,571	$4,247,314
Other operating revenues	189,544	202,364
Total operating revenues	$4,429,115	$4,449,678
Operating expenses	2,962,512	*2,952,612
Net revenue from operations	$1,466,602	$1,497,066
Taxes	431,000	401,000
Operating income	$1,035,602	$1,096,066
Non-operating income:		
Louisville & Interurban Railroad	88,637	126,365
Other non-operating income	10,432	12,165
Total non-operating income	$99,070	$138,530
Gross income	$1,134,673	$1,234,597
Deductions from gross income:		
Interest on bonds and notes	651,750	651,750
Miscellaneous debits	2,366	4,093
Total deductions	$654,116	$655,843
Balance available for dividends on stock	$480,557	$578,753

*Adjusted.

Power has been generated exclusively by the High Street power station since April 7, 1924, although the use of one power house has necessitated a higher degree of maintenance to see that the machinery is operative. Although the Campbell Street plant has been closed down, it is being kept in condition so that in emergency it can be put into service and produce its full complement of power. According to Mr. Barnes the purchase of 8.9 per cent of the company's power requirements from the Louisville Gas & Electric Company since November, 1924, has proved satisfactory and economical.

The company now has 182 miles of single track, of which 140.85 miles is in paved street. Mr. Barnes says:

> Figured on an average life of 25 years in paved street, this would require an average annual replacement of 5.63 miles or 29,726 ft. It will be noticed from the replacement figures for the past four years, which are below this average, that we may expect heavier expenditures in track replacement. The present annual depreciation allowance of $175,000 does not provide for depreciation on track or roadway, so that all our expenditures for these purposes must be carried as maintenance.

The intensive safety work on the

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property in all departments has been followed up as in previous years. The increased efficiency of operation as a result of this campaign is reflected in the following figures:

	1922	1923	1924	1925
Accidents.....	3,272	3,404	1,825	1,534
Miles operated per accident.....	3,323	3,380	6,390	7,432

This improvement is made in spite of the large increase in number of automobiles and trucks operated. The safety dinners have been continued that are given monthly to the carhouse operating the greatest number of miles per accident, those carhouses also being invited that operate in excess of 25,000 miles per accident. To these safety dinners are also invited the other units on the property that operate three months without an accident.

One hundred and seventy-nine employees of the three companies operated in 1925 without an accident compared with 136 in 1924.

The Louisville Railway Co-operative Association continues to function admirably. The number of employees on the three properties on Dec. 31, 1925, was 1,664. Of these 1,330 are members of the association; a great proportion of the balance of non-members of the association are not eligible on account of age or the temporary nature of their employment.

Of the Connelly award Mr. Barnes said:

During 1925 the company lost one of its most faithful employees, Anthony F. Connelly, chief inspector, who died on Dec. 3. In recognition of his services to the company for a period of more than 50 years, one of the company directors, who does not wish his name to appear, has offered an award, hereafter to be called the "Anthony F. Connelly Award," which will consist of a suitable certificate, a medal and purse of $75 and to which the company will add a trip to the annual American Electric Railway Association convention, to be given to that employee who shall be nominated by fellow-employees and selected as most worthy by an award committee. The award is to be based upon sustained record of excellent public service throughout the year or upon one or more individual instances of unusual and outstanding public service, whichever in the opinion of the award committee constitutes the greatest contribution to public welfare and to the public service record of the company.

Fifty names have been submitted for the 1925 Connelly award. From among them the committee will select the winner. Announcement of the winner will be made in the very near future.

At the close of business on Dec. 31, 1925, all the accumulative and current dividends on the preferred stock had been paid.

Loss in January in Toledo

A net loss of $3,789 to the stabilizing fund resulted from January business of the Community Traction Company, Toledo, Ohio. Gross revenue was cut $20,462 under what it was in January, 1925. The decrease is chiefly due to falling off in riding and lower interurban rentals. Operating costs were $226,767 this January as against $230,613 for January, 1925. Revenue passengers carried totaled 4,344,174 in January compared with 4,477,301 in a similar month of last year.

The company now has 49 one-man cars in operation and a considerable saving has been effected in this operation despite the increase in car mileage from 561,566 passenger car-miles last year to 579,919 car-miles January, 1926.

Traffic, Fare and Wage Figures for January

The number of revenue passengers carried by electric railways during January compared with 4,477,301 in the Electric Railway Association, was slightly greater than the number carried in January, 1925. The rate of increase as compared with the rate shown in the latter months of 1925 is somewhat retarded. The following are the figures for revenue passengers reported by 209 companies for the months of January, 1926, and 1925.

January, 1926	746,133,280
January, 1925	742,450,394
Increase, per cent	0.50

Average cash fares in 272 cities of 25,000 population and over:

Feb. 1, 1926	Jan. 1, 1926	Feb. 1, 1925
7.6470 cents	7.6213 cents	7.4963 cents

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track:

	Feb. 1, 1926	Jan. 1, 1926	Feb. 1, 1925
Average hourly rate, cents	56.52	56.30	55.98
Index No. (1913 = 100 per cent)	207.61	206.61	205.43

Hampton Property in Virginia Public Service

Purchase of the Southside Virginia Power Company and formation of a holding company to control Virginia properties has been announced by Fitkin Utilities, Inc. The new holding company will be known as the Virginia Public Service Corporation.

The Southside Virginia Power Company was purchased from Charles and Ira Vaughan, Philadelphia. It operates hydro-electric plants in the south central part of Virginia which distributes through a transmission system at 66,000 volts. The system is connected with the Roanoke Rapids plant of the Virginia Electric Power Company, Richmond.

The Virginia Public Service Corporation becomes a subsidiary of the National Public Service Corporation and includes the Alexandria Light & Power Company, Virginia Western Power Company, Virginia Northern Power Company and Newport News & Hampton Railway, Gas & Electric Company.

Net Income on B.-M. T. Higher.—For the seven months period ended Jan. 31, 1926, operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., and affiliated corporations were $26,142,270, against $25,062,625 for a similar period in 1925. The total operating expenses increased from $16,432,352 for the seven months period of 1925 to $17,008,778 in 1926. The gross income was $7,936,636, against $7,484,157 for the 1925 period. After the consideration of income deductions, net income was $3,378,057 for the seven months period ended Jan. 31, 1926, compared with $2,938,133 for a similar period ended Jan. 31 the year previous.

Net Income Increases.—An increase in the net income of the United Railways & Electric Company, Baltimore, in January, after fixed charges, compared with the similar month of last year is shown by the company's report. The total for this January was $70,135, compared with $35,530 for the previous January. Revenue passengers increased from 18,764,851 in January, 1925, to 18,952,322 this January.

Net Income on Brooklyn City Higher.—For the seven months period ended Jan. 31, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $6,652,393, against $6,625,686 for the seven months period ended Jan. 31, 1925. The net corporate income after income deductions was $852,619 for this year's period, against $819,106 for the seven months period ended Jan. 31, 1925.

Records Show Another Payment on Seattle Purchase.—Another payment has been made by the city of Seattle, Wash., on the street railway purchased from the Puget Sound Power & Light Company in 1918. Ed L. Terry, city treasurer, telegraphed $1,344,825 to the city's fiscal agent in New York to meet payments due March 1. Of this sum, $833,000 is payment on the principal and $291,700 on interest on the railway purchase. The rest was to meet payments on other municipal bonds. The remainder due on the $15,000,000 purchase price of the Seattle Municipal Railway is $10,835,000.

Service Abandoned Until April.—Local trolley service on the New York State Railways in Canandaigua, N. Y., during the winter was discontinued on Feb. 17. Under the terms of its franchise the company is not obliged to furnish trolley service from Dec. 1 to April 1, although this provision has never before been invoked. This action by the railway follows rejection by the city of the company's proposal to replace its electric system with a year-round bus service. Such opposition to this plan developed at hearings that the traction company abandoned the scheme.

January Results in St. Paul Disappointing.—With an increased rate of fare for tokens from 6 cents to six tokens for 40 cents the St. Paul City Railway, St. Paul, Minn., made only $1,924 more in January, 1926, than in January, 1925. Instead of carrying an estimated total of 6,709,000 passengers the number was 6,280,000. Unusually light snows and high temperature are believed to have cut the trolley travel appreciably. The income was about $27,000 short of the allowed 7½ per cent on $16,000,000 valuation. Total operating revenue for the month was $429,263, compared with $425,157 in 1925, but operating expenses advanced from $312,414 to $320,874. On the other hand, through reduction in taxes by the board of abatement of $6,562 for the month the expenses were reduced that amount. Equipment costing $9,000 was extra expense. Gross income for January was an increase of $1,924, or $73,191, compared with $71,266 in 1925.

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Personal Items

Tom Elliott Mill Executive

Officer of Car Building Company Becomes President of Big Southern Ginning Company

Thomas Elliott, vice-president and general manager of the Cincinnati Car Company, Winton Place, Cincinnati, Ohio, has been elected president of the Continental Gin Company, with headquarters at Birmingham, Ala. The company has its main plant in Birmingham, with other plants at Prattville, Ala.; Dallas, Memphis and Atlanta for the manufacture of cotton gins, cotton seed crushers, steam engines, Diesel engines and other machinery to operate the gins and crushers. Mr. Elliott and several influential Southern business men recently acquired extensive interests in the company. He expects eventually to take up his residence in Birmingham, but has made no arrangements to leave the car company and will retain some connection with it.

A Field Familiar to Mr. Elliott

Offhand it might seem that this was a big jump by Mr. Elliott from car building to mill manufacturing after 22 years spent in the former, but it is really nothing of the kind. As indicated incidentally in the interview with Mr. Elliott which was published in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 27, page 385, he has back of him an experience along mechanical lines covering many years spent in the South in territory in which the Continental Gin Company now operates. In fact, his appointment to the post at Birmingham is a testimonial to his abilities from associates with whom he first came in contact when he was serving as a master mechanic for the street railways at Atlanta under the McAdoo régime.

His new work is really a throwback to the old days, for in the early '90s he was the master mechanic and chief engineer of a cotton mill at Knoxville, Tenn. One of the big things that he did on this job was to eliminate roll breakage trouble, a source of constant annoyance in all mill operations up to that time.

From Railway Operator to Car Builder

Tom Elliott got into the car building business because he was known never to shirk a job. He went to Cincinnati ostensibly as chief engineer of the Cincinnati Traction Company in charge of cars, overhead lines and the power station. New shops were built too large for the immediate requirements of the system for repair work and it was decided to start construction of cars. Mr. Elliott was drafted for this work temporarily by W. Kesley Schoepf, then president, with instructions to find a man to take charge of the car plant. Impatient of what appeared to him to be delay on the part of Mr. Elliott in filling the post, Mr. Schoepf a few days later calmly announced to Mr. Elliott that since he had not found the man for the job, Mr. Elliott would have to take it for himself. So the destiny was shaped of the man who later became vice-president and general manager of the Cincinnati Car Company.

Everett W. Sweezy General Manager at Alliance

Everett W. Sweezy is the new general manager of the Stark Electric Railroad, Alliance, Ohio. Occasionally a very big job falls to the lot of a young man. This is what happened in the case of Mr. Sweezy, whose sheepskin can hardly show any indication of age, for it is only four years ago that he was graduated from Harvard University. Immediately thereafter he went into business, joining Harris, Forbes & Company, New York, investment bankers, who have specialized in utility issues. He held this position until last summer.

E. W. Sweezy

In his short apprenticeship he impressed his superiors with his ambition and courage. When the need arose in Alliance for some one to command a losing concern, Mr. Sweezy was selected to assist in developing the 32 miles of interurban which operates between Canton and Salem. He has now been studying the transportation problem there for about six months. The company, sold late last year to Eastern capitalists, was forced into the bus business because of competition with the railway. This was before Mr. Sweezy went to that city. His experience, however, has made him a stanch believer in the electric railway as opposed to the bus. Recently he stated that buses were not a serious competitor of a modern street railway service. Largely as a result of his urging, officials of the Stark Electric Railroad have outlined an improvement program for this summer in which about $400,000 will be spent.

D. C. McClure Resigns at St. Joseph

D. C. McClure, who has been general superintendent of the St. Joseph Railway, Light & Power Company, St. Joseph, Mo., for the past two years, has resigned and has gone to Chicago to serve as vice-president of the Central Public Service Company. This company has its headquarters in Chicago, but the actual working organization is spread out over six states. Some of its properties are in Canada. These units are light, gas and power companies in towns of from eight to forty thousand.

Mr. McClure went to the company at St. Joseph two years ago from the Public Service Company of Colorado. He has been with the Doherty organization since 1913 with the exception of two years spent in the army during the World War.

Mr. Kuertz Leaves Cincinnati Post

W. Jerome Kuertz, street railroad director of Cincinnati, Ohio, for the last six years, stepped out of office on March 1 to resume his law practice. Mr. Kuertz tendered his resignation to Col. C. O. Sherrill, city manager, on Jan. 1, but was asked by the city manager to remain in office until various matters connected with the electric railway and motor bus situation in Cincinnati were settled.

Mr. Kuertz established a fine record while in office. He took an important part in the negotiations which brought about the return of the electric railway system to the Cincinnati Street Railway from the Cincinnati Traction Company.

Mr. Kuertz succeeded W. C. Culkins, executive vice-president of the Cincinnati Chamber of Commerce, as street railroad director. Prior to that time, Mr. Kuertz was assistant city solicitor. When former Mayor George P. Carrel was elected four years ago, he reappointed him.

William Kerber, resident manager of the M. A. Hanna Company, is likely to be Mr. Kuertz's successor.

J. E. Carnes Heads Cincinnati Bus Division

Appointment of Jesse E. Carnes in charge of the bus transportation department of the Cincinnati Street Railway, Cincinnati, Ohio, has been announced by J. P. Stewart, general manager. The bus transportation division is a new department. It will be kept entirely separate from the street railway, both in its personnel and auditing.

The railway plans to operate a number of bus routes in connection with its electric system. Mr. Carnes became associated with the company in 1904 as a conductor. Later he was transferred to the schedule department. For the last five years he has been an inspector. The headquarters of the new department will be in the old Reading power house, which is being converted into a garage. Mr. Carnes will be assisted by John Helmlick and Dewey Newport.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

C. S. Sale Outlines Production Plans

American Car & Foundry Motors Will Operate Two Plants—Colonel Hall in Charge of Production

Major engineering construction activities of the American Car & Foundry Motors Corporation will be concentrated at the Detroit plant, formerly used for railway car manufacture, according to a recent statement made by C. S. Sale, president of the company. Although some rearrangement of tools and equipment is required for the conversion of this plant, it is in general well adapted to bus production, and the necessary changes have already been started and are progressing rapidly.

Facilities now available at the Detroit plant will make possible the production of 30 vehicles a day. These, together with the property available for expansion there, are expected to take care of production requirements for some time. It is thought this plant will be completed for manufacturing operations about May 1 of this year. Present plans call for the concentration of all standard bus and track construction in Detroit. Special units, on the other hand, will probably be handled at the Fageol plant at Kent, Ohio, as there is a continual demand for various modifications of standard chassis, such as special treads, seating arrangements or other body features. The capacity of the Kent plant will be particularly suited to this work.

In line with the general policy of providing all forms of equipment required by existing transportation agencies maintained by the new Brill Corporation, American Car & Foundry Motors will produce trucks particularly adapted for railway requirements, as well as buses and motors. The first type of truck to be produced will be for high-speed, heavy-duty service on pneumatic tires. Work has also been started on the design of a new smaller bus unit than the standard Fageol chassis. This will embody a smaller six-cylinder engine, which, although of smaller bore and reduced power output, will incorporate the standard Hall-Scott engine design features, which have been so popular on the larger engines. Present plans contemplate the starting of production on these smaller buses some time in July of this year, according to Mr. Sale. In addition, it is expected that the first truck unit will be available by September.

Absorption of the Hall-Scott Motor Corporation brings into the Car & Foundry Motors plant, as vice-president in charge of engineering and production, Col. E. J. Hall, who won world-wide renown during the war as one of the co-designers of the famous Liberty airplane motor. American Car & Foundry Motors shares the good fortune of other companies marshaled under the Brill Corporation banner, in being unusually well equipped with executives and engineering talent of the first order.

New Cars Built for Portsmouth

Portsmouth Public Service Company, Portsmouth, Ohio, recently purchased three new cars from the Cincinnati Car Company, Winton Place, Ohio. These cars are arranged for one or two-man operation, with passengers entering at the front door and leaving at the rear when operated by one man. Each will seat 55 passengers. The seat cushions and backs are of a deep spring construction upholstered in genuine brown Spanish leather. Vestibule seats are of the folding type.

Dimensions and general information follow:

Weights:		
Body	12,155	lb.
Electrical equipment, including four G.E. 25-hp. motors	5,012	lb.
Air brakes, including safety control	1,385	lb.
Trucks	8,248	lb.
Total	26,800	lb.
Length over all	42 ft. 11	in.
Length over body	33 ft. 3	in.
Length of platform	4 ft. 10	in.
Rail to top of trolley base	10 ft. 5 11/16	in.
Rail to bottom of side sill	28 11/16	in.
Rail to step	16	in.
Step to platform	14	in.
Width over all	8 ft. 6 1/8	in.
Post centers	30	in.
Clear height inside	7 ft. 3	in.
Width of seat	37	in.
Width of aisle	25	in.
Door opening	42	in.
Truck centers	23 ft. 9	in.
Wheelbase	5 ft. 0	in.
Size of wheels	26	in.
Doors	Sliding	
Type of heaters	Electric	
Type of ventilators	Exhaust	
Vestibule seats	Folding	

Edward Buker Forms New Concern

Formation of a new firm to handle seating material and seating equipment for steam and electric railways and buses is announced by Edward Buker. The firm will be known as the Coach & Car Equipment Corporation. Its headquarters will be in the Railway Exchange Building, Chicago, Ill.

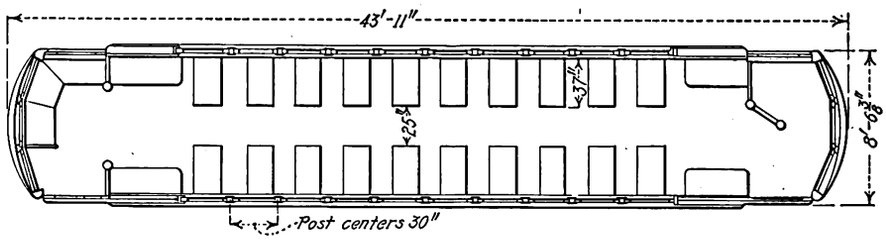
Mr. Buker heads the organization. He was formerly manager of railroad sales for the Heywood-Wakefield Company, with headquarters in Chicago. He has had long experience in railway affairs, both in actual railway practice and in affiliated manufacturing lines. After he was graduated from the University of Illinois, in 1908, he served for three years as a car apprentice with the Pullman Company. Next he served a number of years in steam railroad work and then entered the employ of the Galena Signal Oil Company in 1919 as a mechanical expert and salesman. A year later he was appointed Western sales manager of the Rome Iron Works. In 1920 he became manager of railroad sales for the Heywood-Wakefield Company.

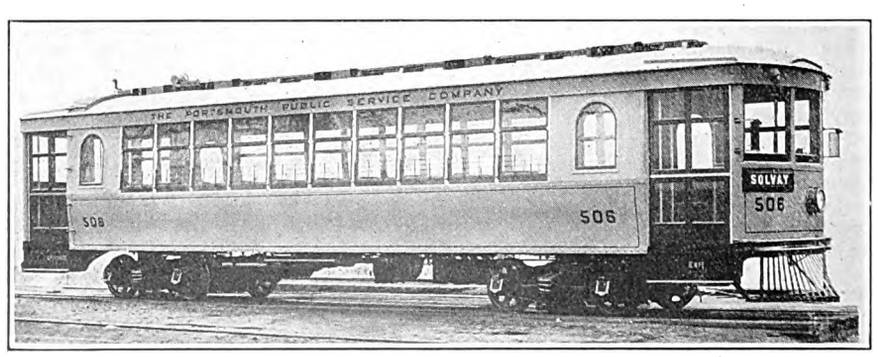
Brake Shoe Profits Rise

American Brake Shoe & Foundry Company for 1925 reports net operating profit of $2,786,607, against $2,454,904. The earnings, after allowing for preferred dividend requirements, equaled $13.57 a share earned on the 156,093 shares no par value common stock outstanding, against $11.54 a share earned on the common in 1924. After payment of dividends and other deductions the surplus was $1,188,712 and the profit and loss surplus was $8,119,314.

Joseph B. Terbell, chairman, in his report to stockholders, said:

> Our working capital position, which had been depleted during the past few years on account of additions to capital assets, is now $9,569,412. Orders so far received in 1926 show a slight increase over the same period last year.





Design of New Portsmouth Cars Provides for Comfortable Seating of 55 Passengers. Ample Window Space Affords Good Illumination

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Edwin B. Meissner Foresees Industry Awakening to Its Opportunity

President of St. Louis Car Company Discusses Status of Car Design Development—Senses a New Spirit of Optimism and Enthusiasm—Believes Industry Is Taking the Initiative in Building Increased Traffic and Good Will

AN INTERVIEW

By Charles Gordon

"THERE is apparent a new spirit in the electric railway industry. There is present a renewed confidence and a revived courage. Enthusiasm has been rapidly growing ever since the last Atlantic City convention. The road ahead looks wider and straighter. The public is awakening to its own needs. It is clearing the route to progress and the industry is becoming alert to the possibilities."

The speaker was Edwin B. Meissner, president St. Louis Car Company. He was answering a question regarding the outlook for the industry. But I attached to his words a deeper significance. To me they seemed in a sense an expression of gratification at the fruition of a cherished desire. They defined not only an existing situation but a long-sought objective. They indicated something of the viewpoint which has supported Ed Meissner in his steady climb from the position of an office boy at $8 a week to the control and presidency, at the age of 41, of the second largest electric car building company in the industry.

We talked in his unpretentious office in St. Louis. With the characteristic reticence of electric railway men toward talking for publication, which has sometimes been a handicap to the exchange of ideas in the industry, he hesitated at an interview. But we met on common ground—a mutual interest in the upbuilding and rejuvenation of an industry.

My first question drew the response quoted at the beginning of this article. It suggests something of the spirit which has dominated the man in maintaining confidence in car building as an enterprise and the electric railway field as a market. Back in 1911 he was suddenly plunged into this business after a long apprenticeship in electric railway operation. That had been a severe apprenticeship, but it developed the determination and persistence that enabled him to wring success from an enterprise beset with many difficulties and discouragements.

When the late John I. Beggs purchased control of the St. Louis Car Company in 1911, Mr. Meissner was taken to St. Louis from the Milwaukee Electric Railway & Light Company and made assistant to the president. In 1916 Mr. Beggs retired from active contact with the car company and Mr. Meissner became vice-president and general manager. In 1924 he was made president. In November, 1925, he demonstrated his continuing faith in the car building business by purchasing Mr. Beggs' controlling interest in the company. At the same time he did something more. He took into partnership all department heads, shop foremen and a large percentage of his employees through the medium of stock ownership. Thus he not only demonstrated his own confidence in the electric railway industry, but he also enlisted that of his subordinates and employees.

Edwin B. Meissner

When he became identified with the car company, it had in its wake a series of reversals and financial difficulties that presented far from an attractive background on which to build. During the succeeding five years the road continued to be a rugged one. To Mr. Meissner's energy and faith largely is attributable the company's survival and progress.

Thus his expression of confidence in the electric railway industry impressed me as being amply supported by the record of his own contact with it. The testimony offered by his experience added conviction to his words and gave increased significance to his views. As we delved further into various phases of present conditions he answered my questions freely, reacting to the opportunity of contributing from his own enthusiasm to the upbuilding of the industry's spirit.

"What has been the principal factor during recent years in limiting the devopment of electric railway equipment?" I asked.

"A delayed awakening to the necessity of improvement," he replied. "Many operators, and their financial superiors, have in a sense lacked an appreciation of the need and demand for something better in railway equipment than has been in use for a number of years. There was a general feeling that electric railway cars were about as efficient and satisfactory as could be desired or expected. This opinion was in the minds of both operators and manufacturers. When competition from automotive vehicles arose, the electric railway industry failed to take the necessary steps promptly to meet the situation. Effort was concentrated on economy rather than on improvements which would attract patronage.

On my further question as to whether a change in viewpoint is materializing, he continued: "Most emphatically yes! Operators and builders alike are today giving increased attention to the factors which make cars more attractive as well as to those that produce economy. Thought is being directed to the lines and appearance of cars in the effort to make them more inviting. Color combinations of exterior and interior are attracting attention as never before."

"Do you think that attractiveness of equipment affects riding even when used for mass transportation in city service?" I persisted.

"For a long time there was only one way to ride," he said. "The public had no choice. It had to be satisfied. The railway industry was lulled into a sense of security—and some carelessness. The automobile brought competition. It brought novelty. It brought unaccustomed luxury. It was backed by the most intensive sales effort the country has ever known. Its use spread from pleasure to business. Comfort, conven-

THIS is the third of a series of interviews with the heads of car building plants and other prominent manufacturers. Rapidly growing interest in the improvement of electric railway equipment throughout the industry makes the views of these manufacturers particularly significant at this time.

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ience and speed formed an irresistible combination. The cost of transportation became a secondary factor. The American people found something that pleased them and they were ready to forget the cost. Electric railways began to feel the effect in the form of depleted revenues, while their own operating costs mounted rapidly during wartime and post-wartime conditions. The industry struggled for several years but was at a loss to find a way of meeting the new conditions. Economies effected through curtailment of service only aggravated the condition. But today there has emerged a new point of view. The industry has taken the offensive. Improved, attractive equipment has proved itself to be an effective weapon. Congestion and parking difficulties have become allies. Experience is now showing that passenger patronage can be won back to the comparative safety and economy of electric car riding by the provision of equipment which appeals to the American sense of progress and pride."

Here was a summary of the situation that called for further discussion. "Do you feel that the condition of electric railway equipment affects a company's relations with the public in the community it serves." I asked.

"There is no question of that. The public reacts favorably to visible evidence of progress and improvement. Regulatory bodies in turn reflect the viewpoint of the public that they represent. Improved equipment offers the opportunity of winning a more friendly attitude from both the public and its representatives. It is encouraging to note that there is a decided tendency to recognize the problems of the railway industry. Visible evidence of the desire to effect improvements, which is afforded by new and attractive equipment, will lend additional impetus to the present tendency to relieve railways from unfair, restrictive regulatory and taxation burdens."

The subject of regulation naturally suggested rate of fare.

"I believe that the public is fair," he said. "It is more interested in the character of service than in the small difference in cost which usually determines the color of the transportation company's balance sheet. That it is willing to pay for improved service has been demonstrated in several cities where the management has made an earnest effort to provide it. New, lightweight and attractive cars will win a rate of fare ample to support good service and at the same time pay a proper return to the investor. There are many properties today on which improved cars equipped with modern devices for safety and speed have resulted in increased riding and a friendly public disposed to grant financial and operating relief to the railway."

"How do you view the outlook for the small property?" I asked.

"There is ample opportunity for the average small property to improve its situation. Because of the more intimate contact which the small town manager has with his public, he must be particularly alert to the opportunity which this offers. I have in mind a comparatively small property which was about 'on the rocks' because of automotive competition aggravated by the condition of its own cars. These were old, poorly maintained and expensive to operate. The management, taking courage from the example of others who had improved their situation under similar conditions, replaced the old equipment with five new cars. The public responded immediately. Today this little property is in sound condition. Lack of faith in its management would long since have resulted in complete abandonment."

It seemed desirable to develop these subjects further, but there were many other questions in my mind. One of these was noise reduction, and I therefore swung to that. "What are the prospects for reducing the noise of car operation?" I asked.

"Modern cars are in general much less noisy than older equipment," was the reply. "This is partly attributable to lighter weight combined with improved truck and spring design." Much of the noise of present car operation is caused by old heavy and run-down equipment. The cars built during the last few years show a decided improvement in this direction. It must be borne in mind that quiet car operation is dependent upon the condition of the track. Rail joints, crossings and special work in poor condition will cause noisy operation despite improvements in the cars themselves. But modern light-weight cars in themselves make it possible to keep the track on a given property in much better condition. Forgetting for the moment the matter of economy in track construction cost that light cars make possible, it has proved next to impossible, even on expensive types of construction, to keep track in proper condition when joints and crossings are subjected to the pounding of heavy obsolete equipment."

"What, in your opinion, is the outlook for the interurban road?" I asked next.

"The interurban road is coming back strong. Highway congestion is having its inevitable effect. The interurban lines, to a large extent operating on private right-of-way, can be equipped to make faster time and insure a greater degree of safety than is possible on the public highway. Much has been accomplished in improving interurban service by the application of equipment that makes possible frequent headways and high acceleration and braking rates combined with increased passenger comfort."

"Do you consider that light-weight interurban cars can be built for safe operation up to maximum speeds of say 50 or 60 m.p.h.?"

"Under present conditions I would say that the ideal formula from the standpoint of safety and comfort is roughly 1,000 lb. for each mile per hour maximum speed. That is to say, a 50,000-lb. car seems to me to afford the ideal combination of weight and strength for 50 m.p.h. maximum speed operation, whereas higher speeds would probably dictate slightly heavier cars."

"In your opinion, are there any advantages in building cars for such service to weigh above these figures?"

"That to a large degree is a matter of personal opinion and choice for safety and comfort. There seems little reason for increasing weight above 60,000 lb. This, of course, depends upon the size of car desired. For a 50-ft. over-all car, I would set 60,000 lb. as a maximum for operation at speeds of 60 m.p.h. It must be remembered, however, that the advantages of frequent service tend to favor comparatively small cars of the lightest possible construction consistent with safety and comfort. Also that more rapid acceleration and braking obtained with such cars holds down the maximum speed required to make a given schedule speed."

"Does experience in the construction of light-weight cars indicate that it is possible to give the degree of riding comfort in such equipment that can be obtained with heavy construction?"

"Light weight affords the opportunity for improved service through quick acceleration. Riding comfort is dependent on truck and spring design rather than on weight. The automobile industry has learned that weight is not necessary to easy riding. On the contrary some of the comparatively light cars achieve as good as or better riding than do much heavier designs even on rough roads."

"Does the equipment trust method of financing new cars offer a satisfactory method of replacing existing obsolete equipment?"

"I had the privilege of being called on to take part in the discussion at one of the meetings during the October convention of the American Electric Railway Association and the subject of purchasing cars on a deferred payment plan basis was brought up during that meeting. I made a statement that properties in reasonably good standing can purchase cars on a basis of a small per cent down payment with the balance spread over a period of from three to five years and at a cost very little above the cash price. Interest rates on such paper are reasonable because car trust paper is recognized in banking circles as one of the best investment securities."

On the outlook for car building business in 1926 Mr. Meissner said:

"Prospects for the year are very bright. Several sizable orders have been placed and many inquiries are being received. The need of much new equipment is being considered throughout the country. The importance of modernization, which was the keynote of our last convention, seems to have taken hold generally. There is a new spirit in the industry and I look for increasing activity during the current year. By next fall I feel that the industry will have clearly manifested a determination to modernize its equipment and definitely to take the offensive in establishing the convenience, comfort and attractiveness of the service that can be offered by electric railways."

New Westinghouse Company in Japan

Westinghouse products will be distributed thoroughout the Japanese Empire by the Westinghouse Electric Company of Japan, newly organized as a subsidiary of the Westinghouse Electric International Company, to give proper service to the many old as well as the new users of Westinghouse apparatus in Japan. The principal office is in Tokyo.

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Bus Maintains Its Position in Limelight

Economic Trends and Present Tendencies in Design Are Pointed Out by Manufacturers—Future of Co-ordinated Bus and Trolley Service Is Predicted—Spirit of Optimism Prevails

SINCE at least 35 per cent of all electric railway lines in the country are now operating co-ordinated bus and trolley service, interest among the operators may naturally be expected to remain at a high point concerning the present and future trends of the bus. Some individuals may be thoroughly "sold" on the bus, believing implicitly in its future; others may be skeptical concerning the surety of that future, but all must agree that the present finds the bus very much alive and one of the greatest aids which the canny operator may turn to his advantage.

By far and large, the balance of opinion among the companies which now operate buses in conjunction with their trolley services seems to favor an attitude of confidence in the future of the bus. Naturally, then, economic trends, tendencies of design, possibilities of further co-ordination of bus and street car service, and such similar subjects continue to occupy a position of importance in the eyes of the industry.

In an effort to give a well-rounded consideration to these various subjects a number of the leading manufacturers of buses were interviewed. Replies from these sources contained much interesting data, and in general the producers were inclined to agree rather closely on the more general phases of the question.

It must be remembered that bus service may roughly be divided into two classes, the first being the application of buses to handling mass transportation in crowded metropolitan districts and the second interurban and commuter service to outlying districts. In the former it is quite natural that emphasis is placed on increased capacities and less attention given to the matter of comfort and of esthetic appearance. In the latter type, however, the trend is all toward the de luxe idea, and there is the opportunity to supply service which will rival the private automobile for comfort and flexibility.

Naturally the adoption of de luxe equipment, enlarged seats, increased knee room, smaller and more attractive appearing vehicles must result in increased fares to the rider. But the average individual is pretty well sold on the idea that "something for nothing" is very much of an anomaly in this world and he is generally willing to pay a fair return for the greater comfort which is his in the newer type of equipment. While the street car is up against certain definite conditions which will prevent the carrying out of this de luxe idea beyond certain limits, because of the fact that it is essentially applicable to mass transportation and must be operated to meet the requirements of the greatest number of people, the bus is not bound by such factors. It may be used in co-ordination with street cars to provide a well-rounded transportation system, adapted alike to the desires and requirements of the banker and the laborer.

Future Rests with Railways

Speaking of the competition between the bus and the previously established forms of transportation A. J. Brosseau, president of the International Motor Company, has this to say:

> It has been said by men in a position to understand the trend of the bus-train-trolley situation that the bus will never supplant completely existing forms of transportation, but will supplement them with the peculiar type of service which the fixed track transit lines cannot supply. It is my sincere belief that the bus question will simmer down shortly to operation on a sound, economic basis. If it is found that it is cheaper to operate buses over a certain route, the bus will be run, but if rail operation is better and cheaper, the rail is the thing.
>
> Existing transportation companies are the logical operators of buses from every viewpoint. They have the capital and the ability to carry on bus operation in a manner that will bring back their former patrons. There is profit in the bus business or it would not continue to exist and to thrive. That profit might just as well be made by the companies who were the pioneers in transportation as by the newcomers.

Carrying on this same vein of thought, Charles H. Wondries, manager of the bus sales department of the Studebaker Corporation, says:

> I believe that this present year will witness the elimination of a great deal of wasteful competition and duplication of service, either through the failure of incompetent operators or the consolidation of competing lines. This step in the development of any business is necessary and will do more than any other thing to promote a healthy and sound growth of bus transportation.

Need for Standardization

Some manufacturers remark the tendency among street railway companies to think that they can design more suitable buses than the producers of that equipment. This, they say, is a continuation of the same tendency that is expressed in the purchase of electric railway rolling stock, wherein each operating company specifies an individual type of car, while in reality a very few types, standardized in their principal features, would doubtless be a whole lot better. In other words a great many of the changes specified by the operating companies are just that—changes and not improvements. The electric railway engineers should get together with the engineers of the bus manufacturers and lay out certain accepted standard designs and then agree to take those standardized models for their own use. In this way the manufacturers believe that a very material saving could be effected in the cost of finished buses.

Types of Buses

No discussion of this nature would be complete without some reference to the gas-electric bus. It looms large in the future because of several very important operating advantages which it has over the mechanical drive. It is still an open question, however, as to whether the gas-electric will effect a saving in operating cost for the reason that it adds considerably to the weight of the job and increases tire and gasoline costs somewhat.

Fageol Motors Company believes that for interurban service what they term the "semi-headroom coach," having the general appearance of an enlarged automobile but with large plate glass windows and luxurious finishings, is apparently the best job and that it will take the place of many of the sedan types which are now making the long runs between cities.

This company also states that there is a noticeable trend toward greater power and a greater number of cylinders. It goes on to say:

> This tendency has been so fast that while we had expected to build about 50 per cent four-cylinder and 50 per cent six-cylinder engines last year, the demand got clear ahead of us, and approximately 80 per cent of our total production was equipped with six-cylinder bus engines. Those manufacturers who have not yet developed the six-cylinder engine will be at a great disadvantage before the present year is over.

On the matter of "service" offered by some manufacturers in connection with their equipment, opinion is divided. Some take the view that this is a highly desirable feature, while others are outspoken in their criticism. The latter group feels that as the railways become more and more familiar with bus operating practice and maintenance methods they will depend less and less upon the service offered by bus manufacturers, preferring to take care of their own maintenance after the established practices in connection with their regular rolling stock. This will put the sales advantage with the manufacturers who are conducting their sales policies along the lines followed by companies selling other equipment in larger volume to the railways, namely, direct factory representation. Thus the distributor, dealer and factory branch will be largely eliminated.

Savings from this step in marketing cost may be expected to reach 50 to 75 per cent, in the opinion of this manufacturer, and he believes that it will be only a matter of a short time before the railways as a whole will realize that this is a sound practice in marketing bus equipment for their use. He says: "The so-called 'service' features offered by the ordinary motor truck marketing system really constitute a very expensive crutch, which is paid for three or four times before you get it, and at least double its regular value after you get it."

Needed Improvements

A number of needed improvements in the bus field in general were suggested. Important among these is the need for an improved type of power transmission, which will get away from the selective type transmission and give a smoothness of accleration comparable to gas-electric operation, but at the same time will eliminate the extra weight necessary for the gas-electric drive. Steering gears of greater strength and durability are also to be desired.

Baggage arrangement is another leading problem in operation over the longer routes. Manufacturers are giving considerable thought to the manner in which baggage should be handled

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in intercity runs with parlor car types of buses. It seems probable, in the opinion of one official, that this problem will eventually be met by the adoption of separate fast trucks which will enable the companies to accept trunks or packages up to the customary railway limit.

All of the bus manufacturers have passed the practical weight limit, states one concern, and they must begin to scale down on the bulk of material that goes into the units. At the same time the equipment must maintain present capacities or possibly carry even more passengers. Lighter and stronger materials are necessary, together with designs that will give adequate strength, with less material.

Babbitt Metal Consumption in January

The Department of Commerce announces the total apparent consumption of babbitt metal, based on reports received from 27 firms, as 5,151,926 lb. in January, as compared with 4,878,806 in December and 5,683,183 in January, 1925. This consumption is calculated from sales by manufacturers and consumption by those firms (among them several important railroad systems) which consume their own production. In the following table the sales of babbitt metal are shown separately from the consumption in the producing plants:

BABBITT METAL CONSUMPTION

(As shown by sales and consumption by producers, in pounds)

1925	Total (Apparent Consumption)	Sales (By Manufacturers)	Consumption (By Producers)
January	5,683,183	4,620,815	1,062,368
February	5,164,619	4,103,340	1,061,279
March	5,644,288	4,395,901	1,248,387
April	5,126,416	3,928,136	1,198,280
May	5,081,668	4,189,558	892,110
June	5,074,966	4,085,125	989,841
July	5,184,196	3,694,386	1,489,810
August	5,441,823	4,068,706	1,373,117
September	4,621,033	3,579,780	1,041,253
October	5,550,247	4,169,870	1,380,377
November	4,954,683	3,534,026	1,420,657
December	*4,878,806	*3,910,160	968,646
Total	*62,405,928	*48,279,803	14,126,125
1926			
January	5,151,926	3,707,615	1,444,311

*Revised.

Pressed Steel Car and G. E. Get $5,000,000 Brooklyn Order

Application has been made by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., to the Transit Commission for approval of a plan for awarding contracts to the General Electric Company and the Pressed Steel Car Company for 67 articulated three-car units. Announcement that the corporation planned to purchase the equipment was made last December.

The order will comprise 201 steel subway car bodies, each three-car unit including four trucks with motors on each truck. The Pressed Steel Car Company submitted the contract for bodies and trucks approved by the B.-M. T. directors and the General Electric Company submitted the approved contract for motors and other electrical equipment. The total cost of the order will be about $5,000,000.

Rolling Stock

Springfield Street Railway, Springfield, Mass., has included the purchase of 50 new cars in its program of improvement outlined for that city, provided the local government meets certain recommendations suggested to it as essential to the proper working out of the plan, digested elsewhere in this issue.

Hydro-Electric Railways, Toronto, Canada, is planning the purchase of twenty double-truck cars for use in Windsor.

Chicago & Joliet Electric Railway, Joliet, Ill., has announced plans to purchase ten new interurban cars for its Joliet to Chicago service. Seven builders have supplied specifications for the new cars and will be asked to submit bids. Each car will have a 52-passenger capacity.

Track and Line

Cincinnati Street Railway, Cincinnati, Ohio, has made application to the Director of Street Railroads of the city to relay the car tracks on Madison Road from Vista Avenue to Elmhurst Place, a distance of ½ mile.

Erie Railways, Erie, Pa., will double-track West Eighth Street from a point 150 ft. east of Poplar Street to a point 100 ft. west of Cascade Street. Under the terms of the ordinance the company is to widen the thoroughfare a full foot on either side between Cherry and Cascade Streets at its own expense.

Memphis Street Railway, Memphis, Tenn., is now improving two projects in trackage, one in the north section and the other in the south. Trilby rail weighing 122 lb. is being put down on both improvements, replacing 70-lb. rail. The equivalent of 4,300 ft. of single track is being installed on the first job and 1,300 ft. on the second.

Pacific Electric Railway, Los Angeles, Cal., will replace with heavier rail 14.7 miles of inbound track between Valley Junction and Vineland near El Monte. This improvement will be started shortly and will entail an expenditure of $296,000. D. W. Pontius, vice-president and general manager of the railway, stated that 90-lb. rails would replace the 70-lb. previously used on this section, which is a part of the main line to Pomona.

Metal, Coal and Material Prices

Metals—New York	Mar. 2, 1926
Copper, electrolytic, cents per lb	14.125
Copper, wire base, cents per lb	16.00
Lead, cents per lb	8.87
Zinc, cents per lb	7.68
Tin, Straits, cents per lb	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.725
Somerset mine run, Boston, net tons	2.175
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.575
Central, Ill., screenings, Chicago, net tons	1.125
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.08
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$0.98

Power Houses, Shops and Buildings

Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, has announced plans for the construction of a carhouse, tracks and overhead wiring at its South First Street property at a cost of $225,000. The change will be made to accommodate expansion of the Quaker Oats plant. The new carhouse site is 300 x 140 ft. and two blocks of new track will be laid.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has completed the erection of its new $150,000 garage on Kinnickinnic Avenue, built to house the company's 130 buses. The garage is 183 ft. long and 240 ft. deep.

Altoona & Logan Valley Electric Railway, Altoona, Pa., generating 3,000 kw. for the operation of the cars in Altoona, Juniata, Hollidaysburg and Tyrone, will abandon its power plant and buy power from the Penn Central Light & Power Company, Altoona. Four substations will be erected by the Penn Central, one station at Hutchinsons, east of Altoona, to include two 750-kw. rotaries; one station at Twentieth Street, Altoona, to include two 750-kw. rotaries; one at Lakemont Park Hill, to contain one 500 and one 200-kw. rotary; one at Fostoria, 6 miles from Altoona, to contain two 200-kw. and one 100-kw. rotaries. Work on the substations will be started at once.

Chicago & Joliet Electric Railway, Joliet, Ill., plans to build two new substations at a cost of $240,000. The power stations will provide power for the Joliet city and Lockport lines and the present St. Louis Street plant will be abandoned when the new ones are opened.

Trade Notes

Wagner Electric Corporation, St. Louis, Mo., announces the removal of its Omaha office to 2566 Leavenworth Street on Jan. 25.

F. H. Reagan has been elected president of the Locke Insulator Corporation, Baltimore, Md.

Concrete Products Company of America announces the removal on March 1 of its Eastern sales office from the Chamber of Commerce Building, Newark, N. J., to 1812 Packard Building, Philadelphia, Pa.

H. S. Durant has been appointed manager of the cold rolled strip and spring sales department of the American Steel & Wire Company, Chicago. He succeeds Lewis Johnson, who died recently.

C. V. Root recently joined the Electric Service Supplies Company, Chicago. In 1912 he became affiliated with Stone & Webster and enlisted in 1917. Since then he has been connected with the Western Electric Company, Davis Company and Westinghouse Company. Mr. Root is to cover the Chicago territory in the interests of floodlighting.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Small Properties, Too, Can Benefit from Modernization

OFTEN it is thought that modernization can pay only on large electric railway properties. Such is not the case, however. In a recent issue appeared an article telling how Zanesville, Ohio, is rebuilding its rail service by new cars operated on reconstructed tracks. Study of the comparative operating statements of 1924 and 1925, after a full year of operation of twenty new cars, demonstrates clearly that these cars were responsible for the lion's share of the $48,000 saving in operating expenses.

It is hardly necessary to expand at length on this theme, as the figures speak for themselves. Only a short time ago ELECTRIC RAILWAY JOURNAL told how the Buffalo and Erie was saved from the scrap heap and turned into an earning property by application of similar principles. In a still earlier issue the modernization of the lines connecting the Attleboros in Massachusetts was described. Other examples of this kind that might be mentioned are the New Haven & Shore Line Railway and the Cumberland Traction Company.

Of course certain conditions must exist in order to make possible a profitable rehabilitation of this kind. For one thing, adequate traffic must be available. Most important, however, is the possessing of vision and foresight—and a management with the courage of its convictions.

Changing Public Attitude May Bring Relief from Unwarranted Imposts

MORE and more publicity and public relations work on the part of the utilities is continually urged, and certainly it should go on. The electric light and power industry has done a masterful job in this respect. The gas industry has done well. The steam railroads and the electric railways have followed suit, but have not measured up in their effort to the power companies. Each utility, fortunately, is profiting to a certain extent by the public relations work of the others.

It is becoming more apparent all the time that out of this combined effort there has already come a profound change in the public attitude. The frequency with which men in public office are making political capital out of the utilities is clearly diminishing. City councils and legislatures are tending more and more to grant the appeals of the railways. Courts and juries are fairer in their damage claim awards.

Out of this improving attitude will come the opportunity for obtaining relief from burdensome imposts which never have been in the best interests of the public, but from which until recently it was almost hopeless to expect relief. Such burdens include the cost of street paving and paving repair, free transportation of policemen, firemen and postmen, franchise taxes and various other imposts whose justification, if there ever was any, dates back to the days of the horse car. But with the public becoming very much enlightened on these matters and with the growth of a general disposition to be fair to the utilities, steps taken to remove the unjust obligations may be expected to meet with greater sucess than in the past. In other words, past failures to obtain relief from these burdens are of little significance now in the light of new public understanding. As time goes on, renewed effort to win such relief in the interest of improved service is more than warranted. Certainly the car rider should not have to pay for anything that does not contribute to the service he receives.

Capital Is an Immediate Need

PERHAPS the greatest need of the electric railways today is capital. How to get it is a problem that is puzzling many managements. Were capital readily available, there are many improvements that could be made, which, modernizing the system, would materially enhance its ability to earn a satisfactory return on the investment.

Much progress has been made during the last five years in improving the status of the industry. Relations with the public are better. The essentiality and permanence of the electric railway have been established. The place of the bus with respect to the rail systems is being better understood. The fixed fare idea has been overcome in most communities. Other fundamentals in the railway situation have been similarly improved. The course to follow, looking toward modernizing the railways and merchandising the rides, has been pretty clearly charted. But it all requires capital.

Seeking capital the railways find that the financial market reflects past conditions, not present. Investors are not yet aware of the very much better position that the electric railways occupy. This makes new financing difficult, and without a greater flow of capital to the industry improvement in earnings is slow.

Employee and customer ownership as a means of distributing securities can be applied to electric railways, as it has been to central stations. It is but a few years ago that electric light companies were forced to resort to this form of financing because the usual methods were too expensive. Now money for junior securities is flowing in so readily to this industry that there is a tendency to revert back to the sale of bonds through banking channels because such money can be secured at very low rates.

No less an authority on utility finance than Samuel Insull said recently that he would far rather sell junior securities of his companies to customers at a discount and with a point or two higher interest rate than to finance by means of senior securities sold at par

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but distributed to investors all over the country. If it can be shown to be wise to put further money into a railway property, that money can be secured through the employee-customer ownership plan with its further advantage of stockholder influence on public relations.

The procedure is simple. First, the executives must be sold on their own company. Then the employees may be sold a financial interest and partnership in the business. Together, then, management and employees have the confidence and enthusiasm which are necessary in selling securities to the public. Once this thing gets started it is like a snowball. The initial capital brings certain improvement in the plant—probably new cars first, because they are the show window of the business. The new cars reduce operating costs and attract additional passengers, so that the net earnings are substantially improved. Improved earnings attract more capital—more capital and more stockholder friends. And so the cycle goes on cumulatively. The difficult period is the start. The course of action is well charted. The industry needs only the will to proceed.

Lo! the Poor Phoenix Railway Not at Death's Door After All

WHEN a horse is sick, call a veterinarian; when a person is sick, call a doctor; but when a street car system is ill even unto death, call an ex-navy man and a specialist in aviation affairs for learned consultation. Such, apparently, was the line of reasoning adopted by the city authorities of Phœnix, Ariz., recently, when they persuaded Commander Abner B. Clements, U.S.N., retired, and J. Frederick Richardson, an expert investigator into the status of air service and Shipping Board affairs, to make a comprehensive survey of the street railway situation, with a view to suggesting ways and means of resuscitating the innocent victim of circumstance.

These two worthies, who happened to be visiting Phœnix at the time, proceeded to make a cursory examination of the patient's condition, and immediately ascertained that the illness was of an economic nature and had nothing to do with operating conditions on the road. They prescribed a bit of osteopathic treatment to the financing of the company and assured the Mayor and City Commissioners that this would soon put the invalid back on its feet once more.

Perhaps the eminent consultants were entirely correct in their diagnosis, but on the face of the thing it is not greatly to be wondered at that a number of citizens of Arizona's capital were moved to a bit of rude humor in discussing these developments. They had witnessed the failure of the city fathers to adopt the so-called Alexander plan, which had been proposed by a group of public-spirited local citizens to meet the exigencies of the situation and which had received the approbation of the special committee of citizens appointed by the former Mayor to settle the transportation question once and for all. Now two gentlemen from the East, with no apparent acquaintance in railway affairs, had presumed to dispose of the whole matter with the simple statement that a little proper financing would do the trick.

The constant turmoil which has surrounded railway affairs ever since the properties passed into the hands of the city some months ago would seem to indicate that a real solution will never be found as long as the railway remains under municipal control. City politics and operating efficiency are frequently poured into the same dish, with the same salubrious results that oil and water would give. If the Phœnix politicians are unwilling to trust local interests with the destinies of the railway they should continue with their avowed intention of finding outside interests who will take it over and properly rehabilitate the property. If financing is needed, and it unquestionably is, it should be provided by private rather than public capital.

Highway Crossing Signs that Father Used Are Not Sufficient Today

"DESPITE the 'Safety First' crusade, despite the glaring newspaper headlines telling of the grizzly harvest of death upon the highways, and despite the knowledge that more people were killed by automobiles last year in the United States than now live in some of the populous counties of Texas and more people injured than now live in the city of Dallas, this tournament with death goes on." Such is a single paragraph from the annual report of Texas Electric Railway. Here is a concrete expression of the ever-increasing reckless driving that Jack Beall sees so clearly.

There is perhaps no problem so vital to the operation of electric railways as that of safety. Not only is it of paramount interest as viewed from the financial aspect of the railroad itself, but from the humanitarian angle as well it demands the most intimate attention. There probably is no industry that has contributed more than that of the electric railways to the promotion of safety work of a public nature, but certainly the work is not done. More co-operation is necessary and even greater effort must be expended before this self-destruction can be curbed.

Mr. Beall continues in his annual report: "In some states the law requires the driver of an automobile to stop before going over a railroad crossing. It is an easy thing to do. It is the safe thing to do. With this done there would be no crossing accidents. Would this be an unreasonable requirement of the auto driver? The laws of Texas now require all railway trains to stop before going over the tracks of another railway unless the crossing is otherwise protected. Likewise, all interurban cars are brought to a full stop before going over railroad crossings. Under city ordinances, street cars must stop before going over a railroad crossing. The law imposes this duty upon the railway companies in the interest of human safety and surely the law may properly require of a man as much care for the protection of himself, his wife, or his children as it now requires of a railroad for the protection of its passengers. . . ."

In Pennsylvania it is almost impossible for an autoist to recover from a railway if a collision occurs unless the driver can prove that he "stopped, looked and listened" before crossing the track. Even so, automobile drivers pay but little attention to this condition. It would appear that immediate effort must be directed toward continued education of the drivers and to the end of providing more and better warning signals at railway crossings.

Crossing protection is in a measure similar to the signal system of a railway. In early days of slow and infrequent trains even single-track roads could be safely dispatched by the old system of train orders. Many

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are today. As the frequency and speed of trains increased, these orders were supplemented by a very elaborate system of block signals, automatic in their operation. In olden days the familiar crossing signal constructed of wood and placed on the edge of the railroad right-of-way was sufficient to warn the driver of a team of horses that he was about to cross a railroad track. Today, horse-drawn vehicles are of minor importance. Fast-moving automobiles have not only taken their place, but have exceeded them in numbers many times over. Besides this, night driving has become more and more a thing to be reckoned with.

Despite these conditions very little has been done to improve the average highway warning signs used at crossings over railroads. The same old wooden crossing sign is placed on the edge of the right-of-way, so close to the track that the driver has little or no warning that he is approaching the railroad tracks. At night these signs are hard to see, and too often the automobile driver does not realize that he is about to cross a track until he actually feels his car go over the rails.

Regulatory bodies today are demanding train control for the more important Class I railroads to increase protection. It might be better to turn their attention to protecting automobilists as well. Crossing signs should be farther back from the railroad track, with two of them, if necessary, one on each side. One of these at least should be illuminated at night either directly or by reflection from headlights. The expense should not be great. But however large it might be, it is of little consequence compared with the cost if a bad accident was caused by their absence.

Cleveland a Good Choice for 1926 Convention

SELECTION of Cleveland for the 45th convention of the American Electric Railway Association is a very fortunate choice. The new public auditorium is one of the finest and best equipped exhibition halls in the country. The floor space of the auditorium will be augmented by the construction of a large building directly adjoining. In addition there will be provision for display of cars and for outdoor exhibits, so that construction machinery can be shown in operation, something impossible in previous exhibits.

The committee in charge has been assured that hotel accommodations will be ample. Investigation has shown that the hotel space reserved for the association will include as many rooms as were utilized last year at Atlantic City. The downtown hotels are as near the auditorium as the most of the Boardwalk hotels are to the pier.

As to cost, everything favors Cleveland. With increases asked this year by the various Atlantic City interests, there should be a material saving all along the line. The price set for space, 75 cents per square foot, is the same that would have been necessary had the convention gone to Atlantic City this year. In the matter of handling and placing exhibit material, the advantage of having available rail facilities directly into the building is worth a great deal and will reduce costs.

Cleveland as the convention city for this year has many advantages apart from those mentioned. The association has gone to Atlantic City for the past three years, breaking the old custom of alternating with some city further west. Cleveland is centrally located, and many companies can send large delegations at a moderate cost, where but a few officers could go to Atlantic City for the same expenditure. There are many important developments in the central territory, particularly in the bus field, so that it is well to make it possible for delegates to spend some time inspecting them before or after the convention.

Many of the manufacturers have their plants near Cleveland, so that it will not be difficult for them to send excellent exhibits. It will be particularly helpful to have working exhibits. The layout will be such that all the buses can be shown together and to advantage. This will be a great advance over last year's situation, which was not entirely satisfactory to any one.

With all these conditions so favorable, everything points to this year as offering possibilities for the best convention in the history of the association. Railway men and manufacturers should see to it that this prediction is borne out.

Trial by Jury as a Means of Making Cars More Comfortable

IF THE PROOF of a pudding is in the eating, surely the real test of a seat is in the sitting. That at least was the thought that actuated the management of the Chicago, Aurora & Elgin Railroad to select a jury from among its employees to try the merits of different types of car seats. Men and women, tall and short, fat and lean, were chosen to perform this judicial function. The old standard seat used on the cars of this company was tried along with modifications suggested by various seat manufacturers and others proposed in a report made by a committee of the Society of Automotive Engineers dealing with automobile design.

Several interesting points were brought out by the comments of the jury. It was the consensus of opinion that the old standard seats were too high from the floor. The women particularly objected to this feature. Moreover, it was found that the most comfortable design was one in which the cushion slanted slightly backward instead of being horizontal. Investigation was made also to discover the proper angle to have between the back of the seat and the cushion. Details of the findings of the jury are given in an article in this issue.

After a new standard seat design was selected based on the findings of the jury, the matter of car steps was considered. Here again the comments of a diverse group of people were found to be very illuminating. The step arrangement finally included in the design of new cars built for this company differed in several important respects from the arrangement formerly used.

Whether or not the type of seat and step found most satisfactory for the Chicago, Aurora & Elgin Railroad would prove equally satisfactory under other conditions is impossible to tell. The point is, however, that the method of selection used by this company developed a design satisfactory for its own use, as proved by the favorable comment received from passengers after the cars began operation. While the plan of selection used is perhaps a novel one, it may well be worth consideration by other managers contemplating the purchase of new equipment.

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Transportation Men Must Supply Facts

Newspaper Comment on New York City Bus Proposal Reflects Colossal Misunderstanding by Press Not Only of New York Conditions, but of General Transportation Question—Great Need for Railway Men to Correct Popular Impression that Is Both False and Misleading

NEWSPAPER comments on the plan recently advanced for the partial substitution of buses for street cars in New York continue in an unending stream. Here and there among these expressions of opinion are found commentators who show some real appreciation of the conditions underlying this latest suggestion, but by and large these comments from papers other than those published in New York show very little understanding of the New York problem. What is far more important, they reflect a lack of knowledge of the fundamental factors in the local transportation problem of the country. Therein does the danger lie to the industry—not only the railway but the bus itself. With the end in view of presenting the situation for the information of the industry, two editorials were published in the JOURNAL last week. Extracts reproduced here from expressions of opinion by newspapers show how wide is the misapprehension of the New York situation and how far afield is much of the editorial thinking, best illustrated by a single phrase in the statement of one of the commentators that "this proposal marks the beginning of the end of surface lines not only in New York but in other cities."

Traction men can ill afford to stand idly by and permit such comment to be spread broadcast without attempting to correct it. Transportation is an engineering and economic problem. The place of the bus is becoming more clearly established as its development proceeds. Unless the public is properly educated to its functions untold damage may be done, not only to existing railway investments but to the future of the bus itself. Demand for wholesale and unwarranted substitution of buses for street cars would force the bus to assume the burdens of a mass transportation agency. It would tend to drag bus fares to the level of railway fares. It would seriously prevent the development of the preferred type of service to which the bus is inherently adapted. Both railway and bus operators should unite in correcting the misunderstanding of the New York situation. A digest of current newspaper opinion shows the character of the comment that is now going to the public.

Necessarily the clippings that have so far come to hand reflect for the most part the sentiment of papers in the East, but the number of items presages a deluge of similar comments by papers from all parts of the country, with the distortion of facts likely to vary with the square of the distance. Captions are harmless that read "Buses and Electric Cars," "Street Cars or Buses?" "Bus Is Here to Stay," "Experimentation in Buses in New York," "Buses and Trolley Cars," but it can hardly be said that captions are either constructive or in accordance with the facts that read "Discarding the Street Cars," "Banishing the Street Car," "Buses Crowding Out Surface Cars," as many of the comments were headed.

The subject was taken up by some of the syndicates. One of these with a string of papers prepared for distribution a story reviewing very briefly the history of transportation in New York City. It carried in at least one instance the heading "New York Driving Trolleys Off Streets to Give Way to More Modern Motor Bus." That in itself was bad enough, but the writer of the story was apparently put to it to find a striking first paragraph with which to entice his reader. This is what he concocted:

"And now it seems that the street car, which these many days has been getting in the way of impatient motorists, is on its bumpety way to the discard, at least so far as New York is concerned. Those paternal souls, the city fathers, have before them a scheme by which the last of these somewhat obsolete vehicles would give way within the near future to the more tractable motor bus.

SOME UNUSUALLY UNFAIR COMMENT

One may dip into the pile of comments almost anywhere and run across expressions similar to that of the Chicago *Journal* to the effect that "the trolley is obsolescent." That paper expresses the opinion that New York may discuss the question of fares and "may obstruct the abandonment of the electric surface cars," but it says that "the notice of the consolidation of the two companies dooms the surface car which runs on steel tracks and steel wheels."

The *Jersey Observer* holds to a similar view. It says that "the surface trolley will vanish from the streets of New York if the plans submitted are accepted by the city officials." That, in substance, is the opening sentence of its editorial "Buses Crowding Out Surface Cars." That paper then pretends to give its readers a summary of the proposal. Its view is that it "costs less to operate the buses."

SUBJECT REACHES CANADA

The Toronto *Globe* contrasts the situation in that city with that in New York. It revives the old idea of the survival of the fittest. Apparently forgetting that the fittest is the best only for a particular environment, it proceeds to generalize. The *Globe* holds to the view that "it cannot be denied that surface lines slow up traffic and contribute to congestion, while it is possible with the elastic bus system to use more streets and distribute traffic to better advantage." It sees hope for the street railway only in speeding up service.

The Philadelphia *Record* expresses the view that the electric railway "is coming to be regarded as archaic and conceivably the trolley car will one day survive only as a museum relic." It sees in its own city a change under way to the bus and it says "it is certain at least that in our overcrowded cities the electric railway is to be largely displaced by the motor bus." Its idea is that "congestion in the business districts of popular cities has become so serious that car tracks and trolley wires

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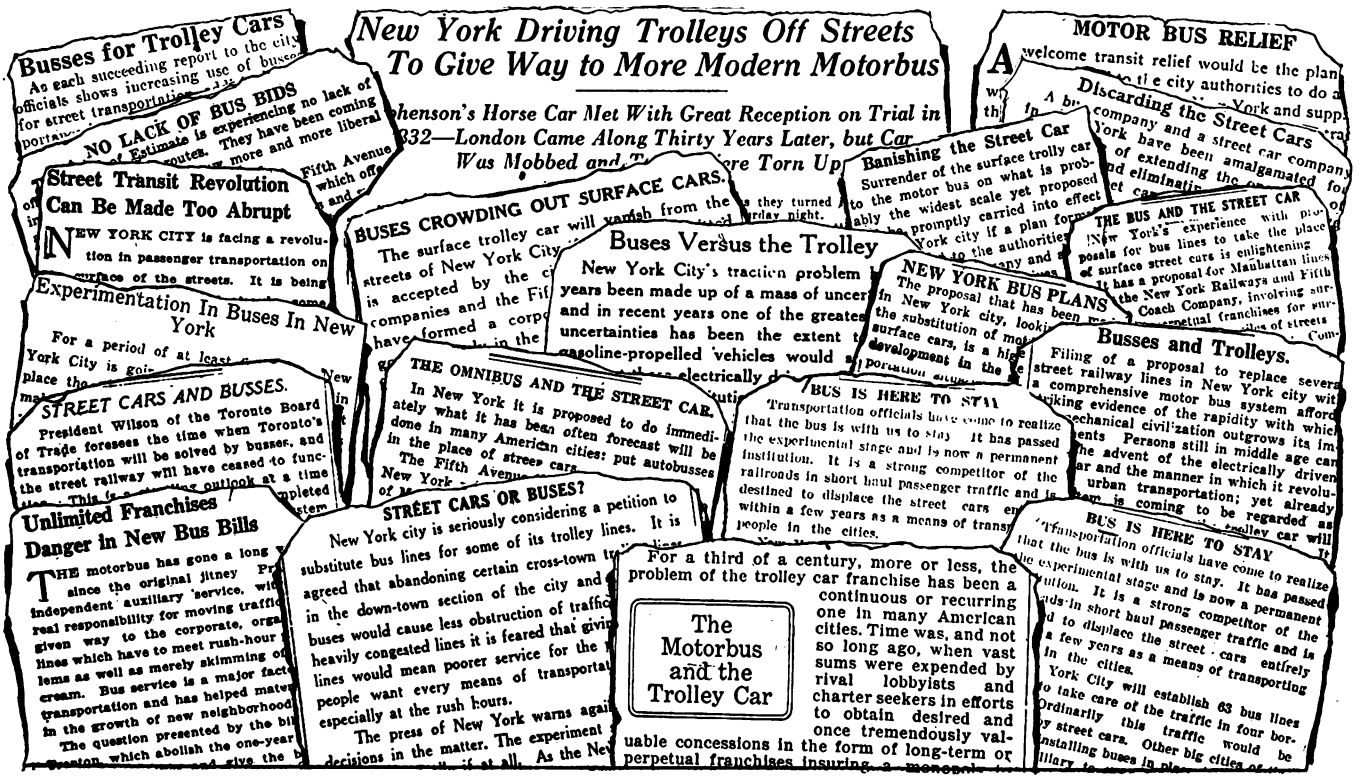
and poles present obstacles to traffic which are productive not only of costly delay and inconvenience, but likewise of danger to life and property." The view which it holds is that "the elimination of the electric railway from all such thoroughfares will ultimately be required." It says that "the obvious means of meeting the needs of public transportation is the motor-driven omnibus." In a concluding paragraph that paper tells its readers that "the enormous surface traffic in the city of London is handled exclusively by motor bus services." It then says that "the adoption of the same method in popular American communities is daily becoming more expedient."

Opinion expressed by the Philadelphia *Ledger* is to it thinks that the acceptance of the proposal "will be a step in that direction." It expresses the belief that "if buses can be provided of sufficiently flexible capacity to meet requirements at all hours of the day, banishment of the street cars on the scale proposed should result in the giving of better and perhaps safer service."

As the *Wall Street News* sees it the people of New York "hold no brief for the trolley or for the bus *per se*." It says that "this threat of wholesale substitution has been constantly in the background, affecting seriously the credit of the street railways and making it easy to draw the hasty conclusion that the days of the trolley were numbered." It calls attention to the fact that the figures of passengers carried on the trol-



Tons of Newspaper Comment Conveyed in Captions to Editorials

the effect that the "talk of substituting bus services for many of the existing crosstown and other trolley lines in New York City is in line with the modern drift in the street railway field." It says of the bus that "if its wider adoption will mean the ultimate removal of the tracks in crowded city centers the innovation will be welcome."

More Conservative Viewpoints

The Asheville, N. C., *Times* says that "the announcement makes clear the fact that the trolley car is not being discarded entirely and that there are some who have considerable doubt as to the advantages of the bus." It sees "the passing of the trolley as a fact, if at the end of the test period it is found the bus is cheaper to operate and that it is safe and more easily handled in traffic."

The Springfield *Republican* refers to the New York proposal as a "bold offer." Its opinion is that "the surface railroad has had hard work to keep above water, as street traffic congestion has constantly reduced the efficiency and the patronage of New York's surface lines." It does not expect that the execution of the proposal will make "New York a trolleyless city," but leys in Manhattan last year speak for themselves, in that these lines transported almost half as many passengers as did the Interborough in the subway and some 2,000,000 more than did the elevated lines. It says that one result of the franker discussion of the place of the bus "as a substitute for the trolley will be a wider realization of the magnitude of the service which the trolley is rendering today." It raises a question about "the extent to which the trolleys themselves could meet the demand for improved service if given a 10-cent fare on the long hauls."

Much more conservative than many of the other comments is an editorial in the Syracuse *Post-Standard*. That paper says that "it is proposed in New York to do immediately what it has been often forecast will be done in many American cities: put auto buses in place of street cars." After this opening sentence it discusses the terms of the proposal submitted and says in conclusion that "the New York proposal does not necessarily mean a revolution in other cities." As the Springfield, Mass., *News* sees it the New York proposal "is a highly significant development in the modern transportation situation." It sees New York as a possible "experiment station wherein all the cities of the

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country could study the problem of bus substitution for trolleys before deciding whether or not it would be wise for them to follow suit."

Experiments with the bus, cautions the Holyoke *Telegram,* should be undertaken gradually if at all. That paper, however, holds that "if one or the other competitor must be abandoned it seems more rational to abandon the trolley lines." The *Telegram* says "it does seem as if a reasonable compromise could be adopted between the two modes of transportation, preserving the merits of both." From observations which it has made of the problem, that paper says that the compromise of which it speaks "has worked well in cities where the trolley systems have taken over the bus lines on seriously competitive routes, dropped track lines that do not pay and used their own buses instead."

It is regarded by the Philadelphia *Bulletin* as advantageous to the city of New York "to have such a number and variety of bus plans laid before it for consideration, regardless of the open question whether the bus is able at all times and under all circumstances to give better transportation service than the street car." The New York *Review* pretends to the belief that "cars on tracks in crowded cities have served their purpose and outlived their usefulness and a more pliable and modern system of transportation is required." In conclusion it says that "buses in place of trolleys, no matter what the fare, will be an improvement devoutly to be thankful for."

Comment by the *Christian Science Monitor* takes a different tack than that of many of its contemporaries. That paper discusses the gradual evolution in transportation. It refers to the offer "as a sweeping proposal" and says that if the offer is accepted the change "would be as revolutionary as that wrought when the trolley rendered the old-time horse car obsolete." It says the plan "marks but another phase of that somewhat more gradual change which is taking place on the country roads and highways." Its idea is that "the bus franchise which today is so highly regarded may, a few years hence, be offered in exchange for the exclusive privilege of operating air taxicabs over a prescribed area."

The Newark *Star-Eagle* says that the New York suggestion has accentuated the importance of the question "whether the trolley should not be abolished." Its treatment of the subject was very short. It sees the Public Service Railway confronted with "conditions similar to those in the metropolis." In conclusion that paper said that "trolley cars may remain convenient for interurban travel, but the lines should be taken off congested streets."

Press of Metropolis More Cautious

So far as acceptance or rejection of the New York proposal is concerned, the New York *World* says "there should be no hurry in the matter." That paper is cognizant of the number of passengers being carried by the surface lines and says: "Particularly should the city go slow in substituting buses for up and down town surface roads in active operation." In conclusion it says that "no risks must be taken in substitutions that any of this traffic be forced into the already congested subway and elevated channels." According to it "bus substitution on a broadening scale has come. The day of the surface railway is evidently waning and from downtown Manhattan it has already gone."

Buses are "destined to play a much larger part in New York transportation," according to the New York *Herald.* It says this is "the one feature on which we are all in agreement." Under the circumstances it counsels public officials to move slowly, "developing and modifying as experience teaches us." More light is needed on "the most efficient type of bus, the cost of operation, on long and short hauls, question of standees and the element of time."

New York City is "facing a revolution in passenger transportation on the surface of the streets," according to the Newark *News.* It says that "neither in New York nor in Newark will the bus push the trolley off the track with a single shove." If that should be tried "it will cause disruption of traffic, financial disaster and create unnecessary perils to life and limb." It says that "the passing of the trolley should not be so abrupt as to cause a total loss to those owning them." Substitution of the bus for the trolley "will not be warranted until it has been demonstrated that the bus can in all contingencies perform the task better than the street car." This New Jersey paper sees in the increased use of buses in its own city "incidents showing the drift in street transportation." It says the "importance of the trolley is on the decline." In its opinion the working out of the problem in New York "will be watched in every part of the country, and in no city with more interest than Newark, where we already have more than a speaking acquaintance with both the good and the bad points of the bus."

The Brooklyn *Daily Eagle* says "it is manifestly desirable to get rid of some surface lines over which little more than a show of service is maintained," but that it is "manifestly desirable to preserve other surface lines, especially in this borough and Queens." The *Standard Union,* also of Brooklyn, says "there ought to be no haste in scrapping the trolley lines in any borough." As it sees it, the principal question to be answered is "whether the car-riding public wants them retained." Its idea is that "if a negative answer can be verified let them (the trolleys) go, but not until then." The Brooklyn *Times* says that the omnibus service must be thoroughly correlated with trolley and subway and such elevated lines as are allowed to continue in the streets. It says "there should be no creation of independent companies to complicate the transit situation of the future." The New York *News* points out that "with a whole system of transportation eliminated and replaced by bus lines the passenger's choice would be narrowed almost to the point of no choice." That paper's concern was not so much with the question of the bus versus the trolley car as it was with trying to make a popular issue out of the 5-cent fare.

"Too much is at stake to warrant hasty action on applications for bus franchises," is the opinion of the New York *Post.* As it saw the matter, "ultimately the surface car may disappear. But ultimately may not mean today or tomorrow. Last year the surface cars in Manhattan carried more than 350,000,000. They serve 2,000,000 more persons than were served by the elevated and nearly half as many as were served by the congested Interborough." The *Post* holds to the belief that "it will take some experimenting to discover whether the bus at present is adapted to city-wide use."

By no means does this exhaust the comment. It takes no account of editorials beginning to appear in the central and the far West. The extracts do, however, show the trend of thought, while the number of the papers which used the topic for a text shows the extent to which it is receiving public attention.

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New Altitude Record for the P.R.T. in Recent Stock Sale

Issue of $10,000,000 Considerably Oversubscribed in Ten Days—List of Stockholders Reads Like an Outline of All Human Activities—A Large Block Still Held in Reserve

"BUTCHER, baker, candlestick maker"—every trade, every profession, practically every walk of life is represented among the purchasers of the recent $10,000,000 preferred stock issue of the Philadelphia Rapid Transit Company. The bank president does not scorn to stand in line at the subway entrance to make his weekly payment on his subscription, nor is the office girl so needful of a "boyish bob" that she cannot spare a dollar a week toward a single share in this novel investment scheme. It is savings reduced to the last word in simplicity.

This undertaking was no exception to the general rule of Mitten Management to do things in a thoroughgoing way. As evidence, but ten days was required to oversubscribe an issue of $10,000,000—a million dollars a day—and the people of Philadelphia evidently would have been quite willing to take on several more millions at the same time had the opportunity been given to them.

Results such as these are not to be obtained from any hasty overnight planning. Before even a breath of rumor had become current in the city concerning the possibility of a major stock issue, a campaign complete to the last and most minute detail had been worked out by the company. No general with the fate of a nation in his hands ever went into battle with a more carefully outlined plan of action.

Cannily, P. R. T. decided with this issue, as with the one of a year ago, to kill two birds with one stone. In other words, it was not only desired to secure a certain sum of money, but also further to cement the bond of co-operation and friendship between the traction company and its patrons. Obviously, one of the best means of accomplishing this latter end was to induce the aforesaid patrons to become joint owners of the company, since no man is prone to criticise too fiercely something in which he himself is financially interested. This does not imply that the operation of P. R. T. is open to criticism by its patrons, but a pointed analogy may be drawn with the case of the man who owns a few shares of stock in a certain oil company. Quite naturally he will be inclined to replenish his gasoline supply with the product of the concern which is paying him dividends. In other words, when car rides mean dollars in the pockets of the stockholders, Philadelphians will be more inclined to make use of the public transportation facilities if they have even a very small financial interest in them.

Probably the most interesting phase of the entire development in connection with this stock issue is the element of democracy which characterizes the list of purchasers. This spirit was, of course, deliberately fostered by the publicity department of the company itself in preparing for the campaign. A very complete series of advertisements was run in all of the Philadelphia papers, Jan. 21 to Feb. 1. Not only did

Riders on the Cars of the P. R. T. Were Certainly Kept Well Posted by Informative Advertisements

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these graphic sales arguments appeal to the various elements of the working class and to professional men and others falling into the salary category, but emphasis was also laid on an appeal to certain primitive instincts and emotions, such as providing for the financial safety of wives and children, teaching the habits of thrift to boys and girls, preparing for independent old age, and similar appeals. Besides the regular English newspapers of Philadelphia, the advertising program was expanded to include two German publications, an Italian, a Jewish and a Hungarian paper, and one paper which catered wholly to the negro population. This was done because it was found in the previous campaign that a large percentage of the purchasers of P. R. T. stock had been made up of the foreign element.

Investors Appreciate Time-Payment Plan

The sale, which was closed, considerably oversubscribed, on the evening of Feb. 1, was a 7 per cent preferred stock issue of 200,000 shares at $50 par value. The stock was open to subscription by individuals in lots of one to 20 shares, which might either be paid for in full or purchased at the rate of $1 per share per week until the full amount had been paid over. The latter alternative, of course, is a very real boon to the individual in straitened financial circumstances, especially since no interest charges are made on such portions of the subscription which remain to be paid. Many expressions of appreciation have been received by P. R. T. for this opportunity which has been extended to the small investor. Typical of these, the following excerpt is cited from the letter of a woman subscriber: "I am buying two shares of your stock. I think it was a remarkable idea to help poor people who really could not afford to pay cash for it and would like to own something for a rainy day. I am all through paying now, and hope soon to be in a position to buy some more."

No one was permitted to purchase more than 20 shares of stock of this one issue, since the company desired to make its list of stockholders just as extensive as possible. The safety of this investment is unquestioned by the stockholders, so wholesome is the respect with which Mitten Managament is regarded by Philadelphians generally.

Operation of the campaign was as follows: Applications for the purchase of stock were made either in person or by mail to the various offices of P. R. T. securities. Following acceptance of the application by the company, those subscribers who had signified their desire to avail themselves of the installment plan of purchase were notified to begin making their weekly payments. Since these may be made to any subway or elevated cashier or to any conductor of the company, the acme of convenience is accorded to the stockholders. In case any individual decides that he cannot go on with his payments, all money paid up to that time will be returned and the stock resold to another person. A receipt is given for each payment and when the full amount has been paid in the stock certificate becomes the property of the subscriber.

This stock is callable at $55 a share. Money derived from the sale of the present issue will be used toward:

Making ordinary extensions and improvements to the transit system.

Building track extensions to serve the Sesqui-Centennial Exposition and to encourage the building of homes in South Philadelphia.

Building and improving motor bus garages, carhouses and power stations.

Purchasing and rehabilitating the Frankford, Tacony & Holmesburg Railway.

Retiring senior securities and replacing in P. R. T. treasury money temporarily taken from P. R. T. reserves for improvements and extensions.

Employees of P. R. T. were encouraged not only to further the sale of stock among patrons of the company but to invest in the securities themselves. All such stock subscriptions are paid for by deduction from pay envelopes. This gives P. R. T. employees two types of saving, the savings fund and the wage fund.

In February, 1925, the first large block of P. R. T. 7 per cent preferred stock was placed on the market; 60,000 shares was the size of the issue and 14,000 car riders oversubscribed this issue in six days. This was no mean record in itself, but the record of the second issue has completely overshadowed it. The remaining block of 100,000 shares is being held in reserve and may later be placed on the market to finance the purchase of the taxicabs by P. R. T.

A List of Typical P.R.T. Stockholders

Nurse	Manicurist	Nickel Plater
Writer	Bench Hand	Carpet Cleaner
Plasterer	Landscape Gardener	Caterer
Florist	Chauffeur	Hairdresser
Pipe Organist	Janitor	Errand Boy
Office Boy	Telegrapher	Ad Writer
Minister	Window Cleaner	Auctioneer
Housewife	Floor Layer	Auto Body Maker
School Teacher	Artists' Model	Motion-Picture Operator
Millwright	Piano Tuner	Veterinarian
Locomotive Engineer	Umbrella Worker	Cream Dipper
Haberdasher	Street Cleaner	Dressmaker
Butler	Stenographer	Stonemason
Golf Professional	Soapmaker	House Painter
Photographer	Dairy Hand	Embalmer
Truck Driver	Soda Dispenser	Policeman
Wigmaker	Farmer	Chiropodist
Mailman	Penmaker	Steeplejack
Iceman	Barber	Lace Weaver
Soldier	Clerk	Detective
Confectioner	Chemist	Bootblack
Tree Surgeon		

Insurance Plan Popular with Chicago Employees

A NEW feature for the benefit of employees of the Chicago Rapid Transit Company and their dependents in the form of group insurance was introduced by the company at the beginning of 1925. Through an arrangement with the Metropolitan Life Insurance Company, policies for $1,000 life insurance and an additional $1,000 in case of death through accident and also carrying a permanent disability benefit were provided. This was so attractive to employees that at the end of 1925 the company extended the plan so as to permit the insured employees to double their insurance protection, each now being insured for $2,000 ordinary life insurance and for $2,000 additional in case of accidental death. The cost is paid partly by the company, and 5,506, or 95 per cent of the total of employees, are protected by this plan. The total face amount of the group life insurance policy covering the employees in the service of the company is now $9,468,000, this being doubled as respects deaths from accident.

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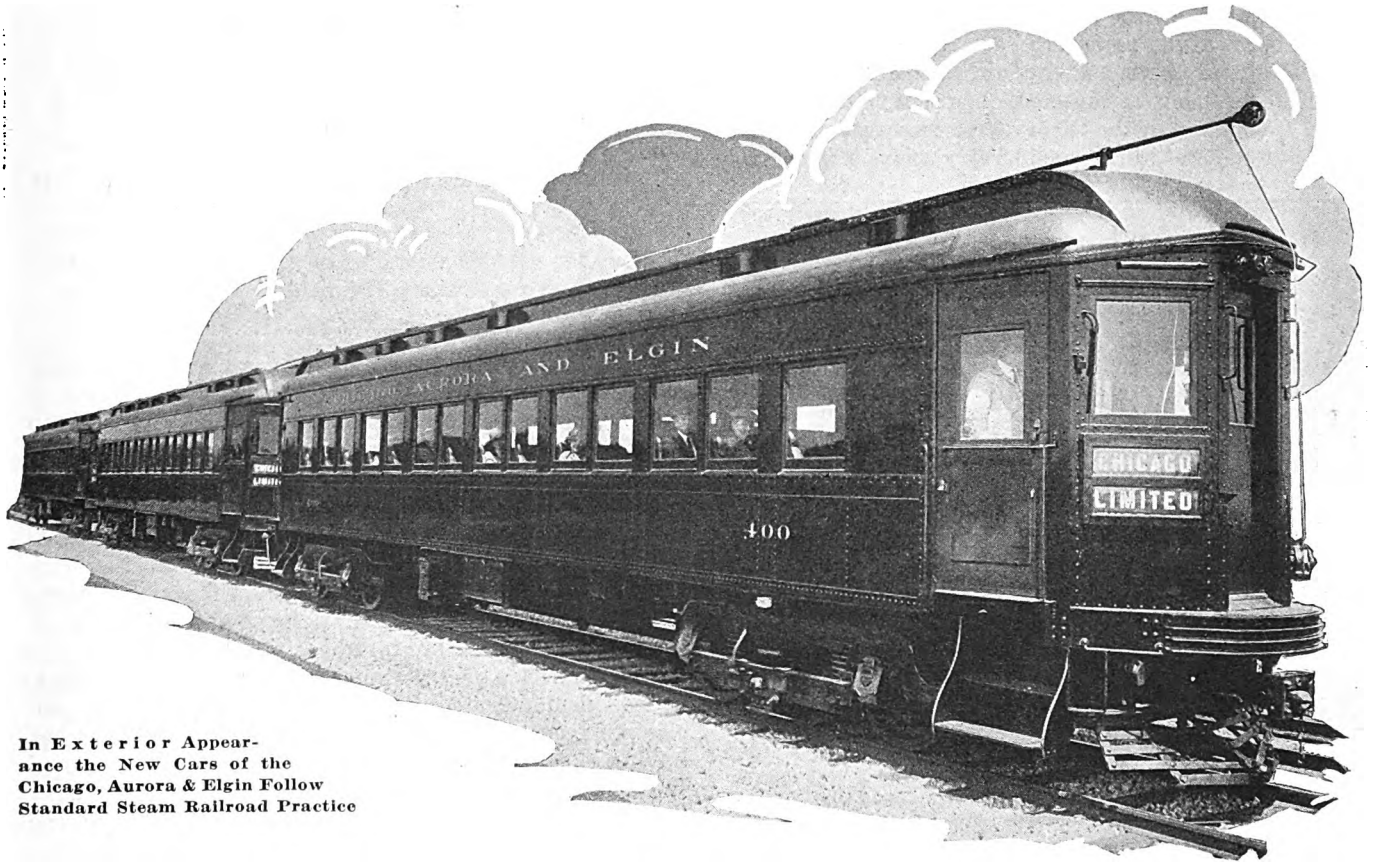
From Receivership to Prosperity in Three Years

THIRD ARTICLE

New Cars Attract Traffic to the Chicago, Aurora & Elgin Railroad in Competition with High-Class Steam Road Service—Careful Studies Made to Determine Most Comfortable Type of Seat and Most Convenient Step Arrangement—Shop Facilities Have Been Increased—Purchase of More New Rolling Stock Planned



In Exterior Appearance the New Cars of the Chicago, Aurora & Elgin Follow Standard Steam Railroad Practice

REALIZING that the successful merchandising of transportation can only be accomplished with attractive, comfortable cars, twenty all-steel, 51-ton, 58-passenger cars were purchased from the Pullman Company by the Chicago, Aurora & Elgin Railroad as part of its rehabilitation program. To attract traffic in competition with the high-class service offered by the steam carriers the management believed it necessary to have not only a smooth roadbed protected with block signals and a power supply sufficient to move trains at high speed, but a type of car which was equal to the equipment operated by the steam carriers. The cars which were on hand at the time the new company was organized were comparatively modern in appearance, and after a thorough rehabilitation could be made suitable for rush-hour and local service. It was therefore decided that the new equipment should be designed for high-speed, long-distance through service, serving the terminal cities of Aurora, Elgin, Batavia, Geneva and St. Charles in the Fox River Valley, and the towns of Wheaton, Glen Ellyn and Lombard in the suburban belt.

In view of the fact that a one-way trip of these trains consumed at least one hour, the matter of the comfort of the passengers was considered to be of prime importance. The designing of the new cars began with the development of a thoroughly comfortable seat. Various manufacturers of seats were requested to furnish samples, which were installed in the older cars for study and criticism. These seats all had good points but none was thought to be entirely satisfactory.

Believing that automobile manufacturers had made great progress in working out the problem of a comfortable seat, Dr. Thomas Conway, Jr., president of the company, resolved to apply the principles and tests used by a committee of the American Society of Automotive Engineers, which had made a most extensive study of seat designs for high-class automobiles. A detailed drawing was made showing:

1. The then standard car seat in use on the property.
2. A sample seat recommended by Hale & Kilburn.
3. The recommendations of the special committee of the American Society of Automotive Engineers.

Study of these drawings disclosed radical differences.

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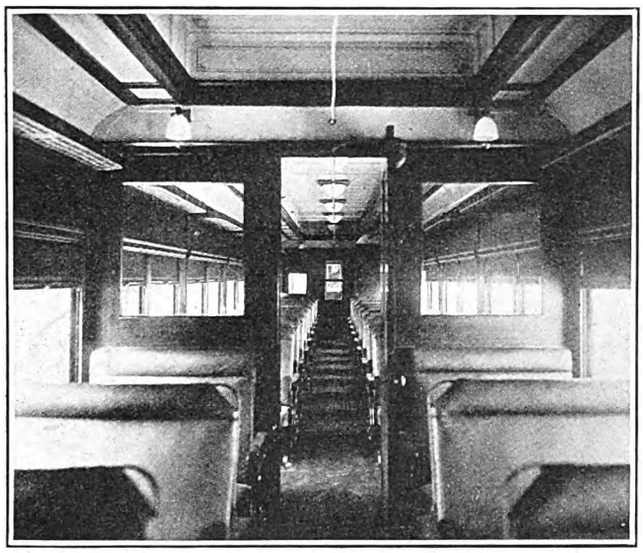
between the prevailing practice of automobile manufacturers and that of the car builders. For instance, the height of the cushion of the car seats ranged from 18 in. to 19 in. above the floor, while the height recommended by the automotive committee was 14 in. The distance from the front of the seat cushion to the foot rest in the case of the car seats ranged from 21½ in. to 22¼ in.; the leading automobile manufacturers were using a range from 17 in. to 21 in.; the special committee of automotive engineers recommended 18 in. as the proper distance.

A radical difference in practice was also clearly brought out as regards the relation of the angle of the seat to the back. The distinguishing characteristic of the automobile seat is the strict adherence to the rule that the plane of the back and the plane of the seat should be at right angles to each other. The practice in building car seats had theretofore been to make the angle of the back to the cushion greater than a right angle. Working on the theory that the seats of a high-class automobile were considerably more comfortable



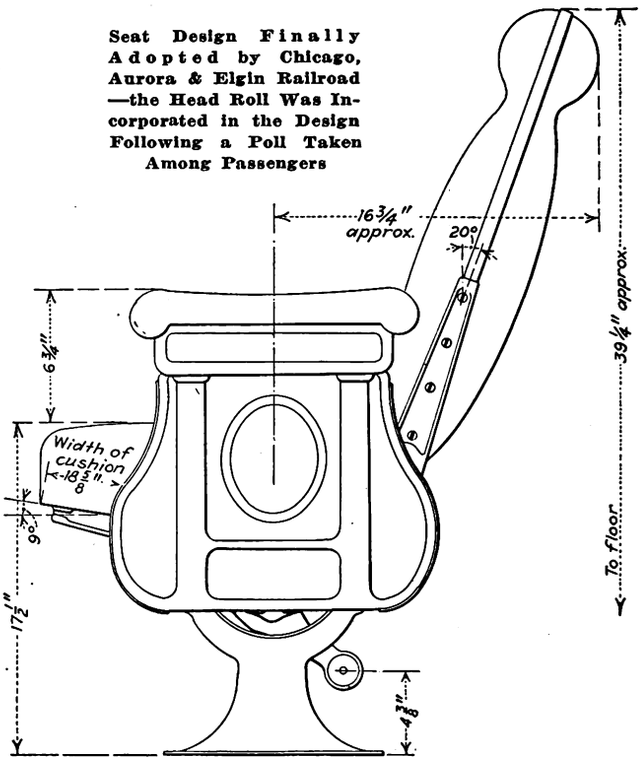
The Car Interior Is Divided into a Main and a Smoking Compartment by a Glass Partition. Note the Characteristic Pullman Appearance

than those of the average railway passenger coach, a special committee, headed by W. L. Butler, assistant to the president, began a series of experiments for the purpose of determining what change should be made in the car seats for the purpose of making them as comfortable to the average rider as the high-class automobile seat. In order to assist him in this endeavor, a jury, composed of an equal number of men and women, of all sizes, widths and ages, was selected from among the officers and employees and their families. They entered with great interest into the study of the problem before them, and by making changes and adaptations in the car seats, the following facts were conclusively demonstrated, as shown by the reports of the jury:

1. That the height of the cushion of the existing car seats from the floor was too high for the comfort of the average woman passenger. They had been designed by men along lines which were most comfortable for men. The average woman could not keep her feet on the floor and, therefore, was more subject to the oscillations of the car than the average man.

2. That the chief reason why the average passenger

Seat Design Finally Adopted by Chicago, Aurora & Elgin Railroad —the Head Roll Was Incorporated in the Design Following a Poll Taken Among Passengers



coach seat is less comfortable than an automobile seat was the pitch of the seat itself; the backward slope of the cushion of an automobile seat is much greater than a railway coach seat. When a railway coach seat was given the same pitch, a marked improvement was reported by every member of the jury.

3. When changes were made to bring about a right-angle correlation between the center line at the back and the bearing surface of the cushion it was the unanimous opinion of the jury that the comfort of the railway seat was much improved.

After a series of experiments in the company's shops, it was demonstrated that from the standpoint of all classes of passengers the most satisfactory seat was one having a height of 17½ in. from the floor to the top of the cushion; a width of cushion of 18⅝ in.; arm rests 6¾ in. above the cushion, and a backward slope of the cushion 9 deg. from the horizontal with the back cushion at right angles to the plane of the seat cushion. By questionnaires distributed among the passengers it was demonstrated that there was an overwhelming preference for a head roll on the seats. Accordingly these were incorporated in the design.

This type of seat has proved to be tremendously popular with the traveling public and most flattering comments have been received with respect to it. In fact, the company has been somewhat embarrassed by the criticisms which were received from through passengers whenever service conditions required the operation of cars having the older type of seats, which long-distance passengers say are far less comfortable.

Step Arrangement Investigated

Another matter concerning which an interesting study was made was the design of car steps. Aurora-Elgin coaches adhere to the same standards as those of the steam railroads; that is to say, flush platforms are used, center sills running continuously from bumper to bumper. Platform heights are governed by the elevated platforms in Chicago. A variety of conditions are encountered; at some points passengers board from the

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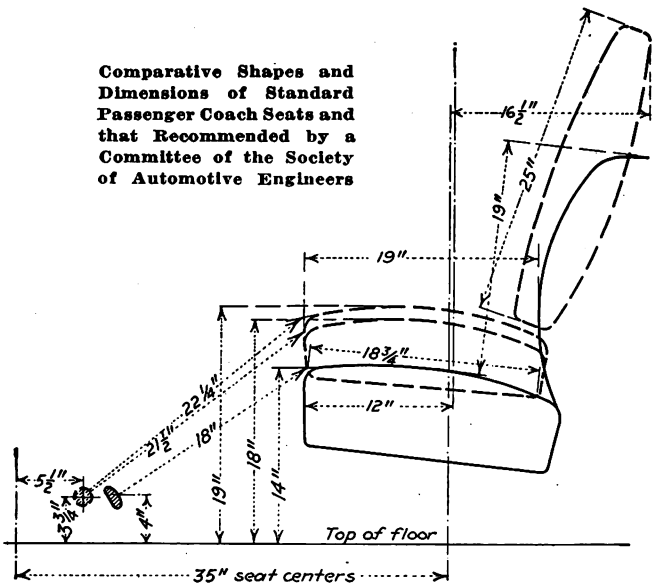


Comparative Shapes and Dimensions of Standard Passenger Coach Seats and that Recommended by a Committee of the Society of Automotive Engineers

street level, at others from station platforms the surface of which is above the level of the rail, while at other points passengers board from elevated platforms, the level of which is practically identical with the level of the car platforms. Third rail clearances and the necessity of clearing vehicles while operating in the streets also had to be considered. The same jury was used in studying this problem. It was agreed by all members of the jury that the then standard car step was not entirely satisfactory, particularly to women and people of advanced age.

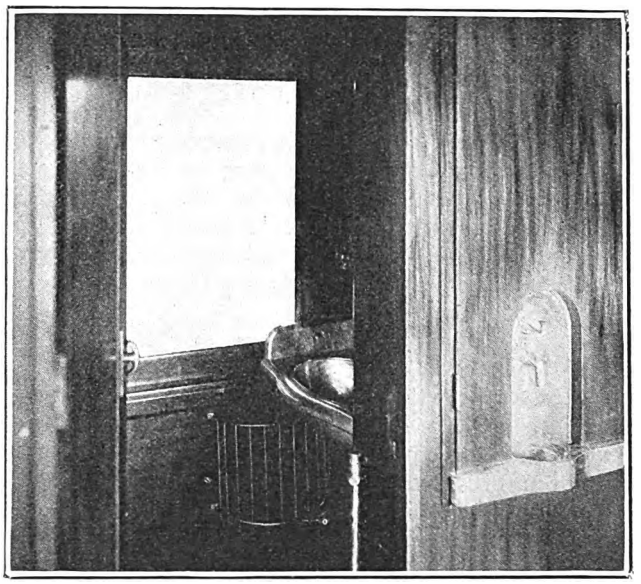
For the purpose of assisting in the study of this problem, a long platform was built at standard height and various types of steps used upon this and other properties operating under generally similar conditions were experimented with. The technical committee, headed by Mr. Butler, also constructed various modifications of these steps and installed them side by side with those used elsewhere for the purpose of affording a comparison. It was discovered that the real test of a step is encountered when a passenger is carrying a bundle or, more particularly, a child. Thereafter all tests were made with members of the jury carrying sand bags or other similar bundles. The defects of the various types of steps immediately became clearly apparent.

All published literature concerning the problem of step design and construction was combed for suggestions and principles and the results thereof applied in so far as possible. With this as a basis and by the process of cut and try the most satisfactory type of step, from the standpoint of every type of passenger, was evolved and specifications thereof worked out and embodied in the new cars. It was found in practice that these steps were most favorably commented upon by passengers, because of ease of boarding and alighting, and the greater sense of security the passenger enjoyed in using them as compared with the older type of steps. It has also been found that when loading from the street or ground platforms the speed of loading is materially increased with the new type of step.

Car Bodies of Heavy Steel Construction

After working out these fundamental problems a body design embodying safety and comfort of the passenger, long service life, easy riding qualities—particularly at very high speeds—and low maintenance costs was evolved step by step. The car body, of steel construction throughout with the exception of floors, window sash and doors, is carried on a heavy steel channel sub-frame which is mounted on Commonwealth Steel Company's solid frame trucks. These trucks are of heavy construction and are provided with special elliptic springs and double equalizer bar suspension. Both trucks are equipped with two G.E. 254, 140-hp. motors, inside hung, and 37-in. diameter rolled-steel wheels. The motors are of the interpole ventilated type with tapped fields and are geared 2.16 to 1, giving the car a free running speed of 72 m.p.h. As the power conductor is a third rail upon which operates a shoe held to it by gravity, each truck is equipped with two air-operated sleet scrapers to combat sleet difficulties. One is mounted on the insulator bar on each side of the truck and is controlled manually from the motorman's cab.

Inasmuch as this equipment must operate over the tracks of the Chicago Rapid Transit Company from Laramie Avenue to Wells Street Terminal it was necessary to construct the cars within certain limitations.



Convenient Lavatory Facilities Are Provided in the New Cars

The width was restricted to 8 ft. 10 in., the distance between truck centers limited to 34 ft. 3 in., and the overhang at the ends of the car had to be reduced to a minimum. These restrictions were necessary in order that the cars might pass the elevated platforms. The car is also mounted so that it will operate on 90-ft. radius curves, which are found on the elevated structure.

The exterior of the car is painted in a brilliant red which is striped and decorated in gold leaf, with the name of the company in gold letters on the wide letterboard above the single sash windows. The car has a monitor type roof, similar to standard steam railroad car practice. As the car is designed for double-end operation, steps have been provided on both sides of each end. The step wells are covered by means of a steel trapdoor, with the vestibule closing door shut against the trap.

Two trolley poles are mounted on the roof, in order that the car may be operated over the tracks in the cities which require overhead trolley systems. The motorman's apparatus is located on the inside of the dash on the right-hand side of the car. On the outside of the dash on the right-hand side is located a Hunter

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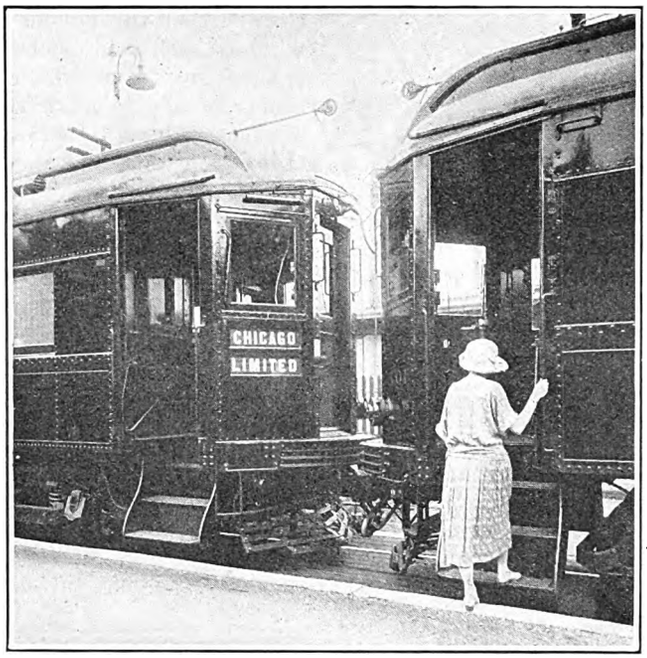
destination sign. The windows in the end of the car have been made especially long, somewhat accentuating the height of the car body. The bumpers are of steel construction and are provided with anti-climbers. Tomlinson automatic car and air couplers were installed with provision for coupling the supply and train air lines. Standard air hose has been provided at each end of the car for use in case the coupler becomes inoperative, or when coupling with some of the older equipment not provided with Tomlinson couplers. An adapter link is provided for coupling between the two types of couplers.



Steps Were Specially Designed for Convenience of Passengers Carrying Bundles and Children

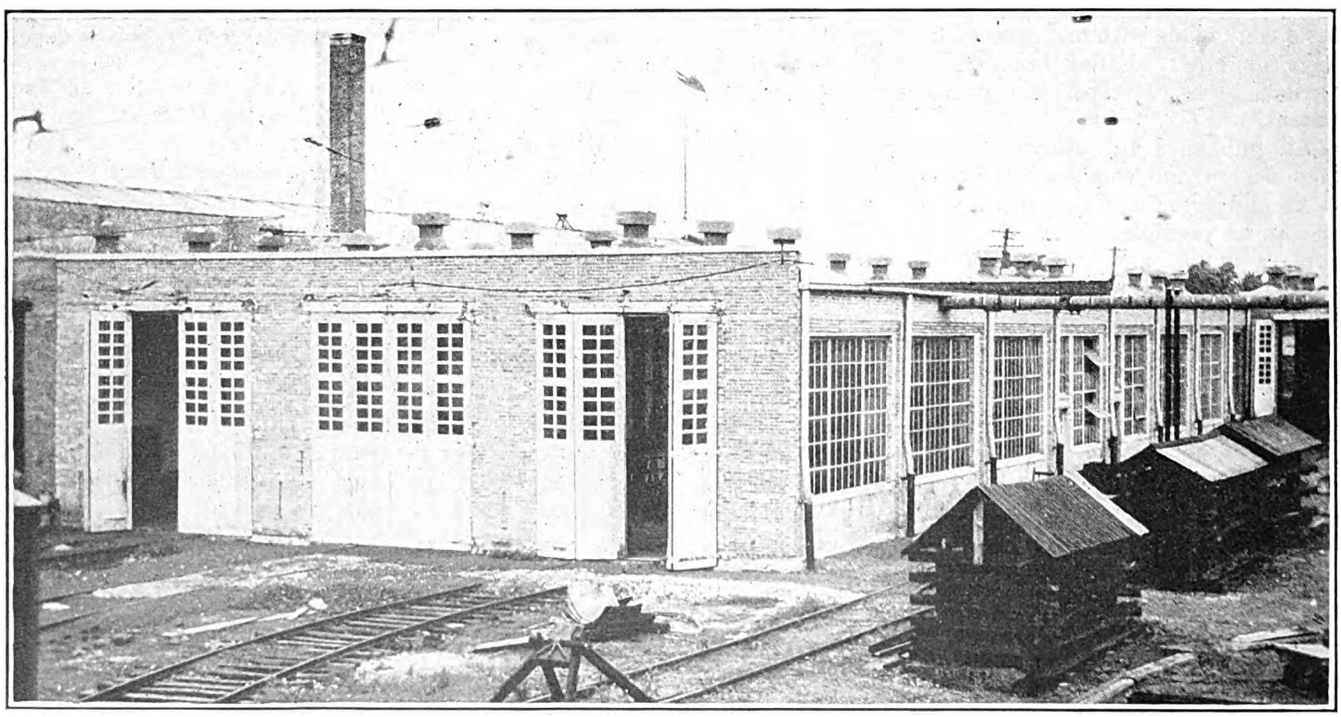
A pleasing interior appearance is obtained with the red mahogany finish and the cream enameled ceiling. Black leather upholstered seats, a white maple floor and plate glass partitions between the two sections of the car add to its attractiveness. Above the single sash windows is a wide panel upon which are mounted parcel racks. A row of dome lights is mounted down the center of the ceiling.

The car body is divided into a smoking and main compartment by a steel partition, the upper half of which is glazed with beveled plate glass. A swinging door with an air door check closes the passageway between the two compartments. Seats for 45 passengers have been provided in the main compartment, while thirteen may be accommodated in the smoking compartment. On one side of the aisle at the rear end of the car body is a toilet room which is furnished with a flush type toilet, a corner style washbowl, a plate glass mirror and electric heaters. A 50-gal. water supply tank is carried overhead in order to furnish the water for the bowl and lavatory. The length of the room is 6 ft. 4 in., the width 2 ft. 4 in., and the height 6 ft. 4 in.

All car windows are glazed with heavy plate glass, while the sash is arranged to raise, being provided with O. M. Edwards type of lock and catch. The side windows are covered with Pantasote curtains with fixtures furnished by the National Lock Washer Company. In the smoking compartment a clothes locker was furnished for the use of the trainmen. This has a width of 30 in., a depth of 9½ in., and a height of 6 ft. 10 in.

Electric heating has been provided by means of a Consolidated thermostatically controlled electric heater mounted under each seat. The interior illumination is effected by means of eighteen lamps. Eight 100-watt dome lamps are in series with a selector switch and pilot lamp located on one of the platforms. In addition to these eight heavy-wattage lamps, ten lamps are mounted in brackets provided with frosted shades located along the sides of the car body in order to light the corners. These small lamps are of 36-watt capacity and have no compensating feature.

As the cars are designed for train operation, provision was made for connecting the control circuits be-



Addition Made to Wheaton Shop Has Increased Its Capacity by Eight Cars

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tween cars by means of a train-line conductor jumper. The receptacle for this jumper is located underneath the bumper. In addition to this electrical connection, a bus line has been provided for the main current circuit in order that the crossing and highway gaps in the third rail will not cause an interruption in the lighting and operation of the train. This bus line is held in receptacles mounted above the car-to-car vestibule door. In addition to this overhead connection, a buzzer circuit jumper is also mounted above the car-to-car vestibule door. The signal to the motorman is given from any car of the train by a buzzer which is actuated by means of the customary bell cord.

ADDITIONAL SHOP FACILITIES PROVIDED

To handle the new rolling stock an addition was made to the main shop building at Wheaton to accommodate eight cars. A new paint shop measuring 60 ft. x 80 ft. has three tracks each capable of receiving one car. A carpenter shop measuring 60 ft. x 140 ft. accommodates four cars over shallow inspection pits. A wash track adjacent to the carpenter shop is inclosed by a building 20 ft. x 65 ft., capable of receiving one car. These new buildings are of one-story brick construction, built adjacent to the old shops, with one wall common to both the old shop and the addition. The outer side wall of the addition is of brick pilaster construction with fully 60 per cent of the wall area of glass mounted in steel sash. Swinging doors at the ends inclose the track openings in cold or inclement weather. A cement floor is laid throughout the additions, while the wood planked and beamed ceiling is supported on steel columns. Sliding fireproof doors close the openings between the various sections of the addition and the passageway between the new addition and the old building.

Plans are in formation for the purchase of a new type of equipment designed for local service. The tremendous growth in the suburban district east of Wheaton now requires the purchase of additional equipment for use in this service. Conditions under which this local equipment must operate are severe. In order to furnish rapid service to points as far west as Wheaton and to meet the competition of the Northwestern Railroad, it is necessary to make a schedule providing for running time of less than one hour between Wells Street Terminal, Chicago, and Wheaton—a distance of 25 miles. In doing this stops averaging one every two-thirds of a mile must be made. This requires a free running speed of from 55 to 60 m.p.h. and very rapid acceleration and deceleration. It is believed that a car which will seat 56 passengers and meet these conditions can be constructed which will weigh not to exceed 75,000 lb., including electric multiple-unit control apparatus and all other mechanical and electric accessories.

Property Expansion in St. Louis

PLANS have been made for a six-story building with arcade features to cost $500,000 at the western terminal of the Wellston division of the United Railways, Hodiamont and Eastern Avenues, St. Louis, Mo. The railway had sold the east half of the block to N. Pelligreen, president of the Pelligreen Construction & Investment Company, 816 Pine Street, who will build the new structure as soon as existing leases expire. Under the arrangement with Mr. Pelligreen the station for the Wellston, St. Charles and Kirkwood-Ferguson Street car lines will remain at the western end of the block. This station will be enlarged when reorganization of the street car company is perfected. Through the agreement Mr. Pelligreen will convey to the car company a front of 25 ft. on Hodiamont, 119 ft. on Theodosia and 120 ft. along the right-of-way of the Kirkwood-Ferguson line to provide a loop for the Wellston cars.

Pittsburgh's Request for Suggestions Receives Hearty Response

DURING the week of Jan. 27, 1926, the Pittsburgh Railways placed 50,000 copies of a suggestion blank in the containers that usually supply copies of the *Transit Guest*. Each blank bore the simple introduction "Pittsburgh Railways Company, Commercial Department. Gentlemen: I desire to submit the following suggestion. . . ." After a blank space, a second statement read: "The adoption of this suggestion will result in the following advantages. . . ." Space was also left for the name and address of the customer making the suggestion. Envelopes were also provided by the company.

When the customer had completed his suggestion, he placed it in the envelope and turned it in to one of the conductors or motormen. So great was the demand for these suggestion forms that the supply was exhausted during the third day. Most of the passengers took the forms home and worked up the suggestions there.

More than 3,000 replies containing written signed suggestions were received in five days and have been coming in at the rate of 50 per day since then. Disregarding a portion of about 10 per cent of the replies, which were flippant and semi-humorous comment, the remainder divides into a large variety of suggestions on both operating and equipment subjects. Among suggestions made on the subject of fares were proposals for a school children's weekly pass; for an extension of the adult weekly pass to outer zones, and requests for additional transfer privileges. Other suggestions were for a $1.25 instead of a $1.50 weekly pass and a 10-cent cash fare, omitting the 8½-cent token. Very few patrons made any reference to nickel fares. There are already in use a number of short-haul 5-cent routes.

Despite the obvious impossibility of providing express service under the short headway conditions on most of the lines, numerous suggestions were made to run the second or third cars in the schedule as express cars. The subject of loading and unloading places in downtown districts also led to many suggestions. Other proposals included extensions of routes, installation of clocks, signs inside the cars to indicate the name and course of the route, local schedule cards for passengers, totally opposite ideas of heating and ventilation, objections to spitting by fellow passengers, widely different views of stop spacing, bunching of cars, more shelters, token vending machines, etc.

All suggestions are being classified and will be faithfully considered in due course. Every answer is being acknowledged in a form letter, signed by W. H. Boyce, commercial manager, reading as follows:

> Dear Patrons: Your suggestion has been received, and we thank you for the interest you have shown in our problems.
>
> Due to the very great number of suggestions that have come in and the necessity of making investigations, a detailed answer cannot be made at this time, but will be made later. Very truly yours, W. H. BOYCE.

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Will Interstate Loop Plan Improve Commuter Transportation?

Relief for North Jersey Is Urgently Needed as Present Facilities Are Near the Saturation Point — Plan Proposed by the North Jersey Transit Commission Is Analyzed and Objections to Certain Features Are Outlined—Some Possible Modifications Are Suggested

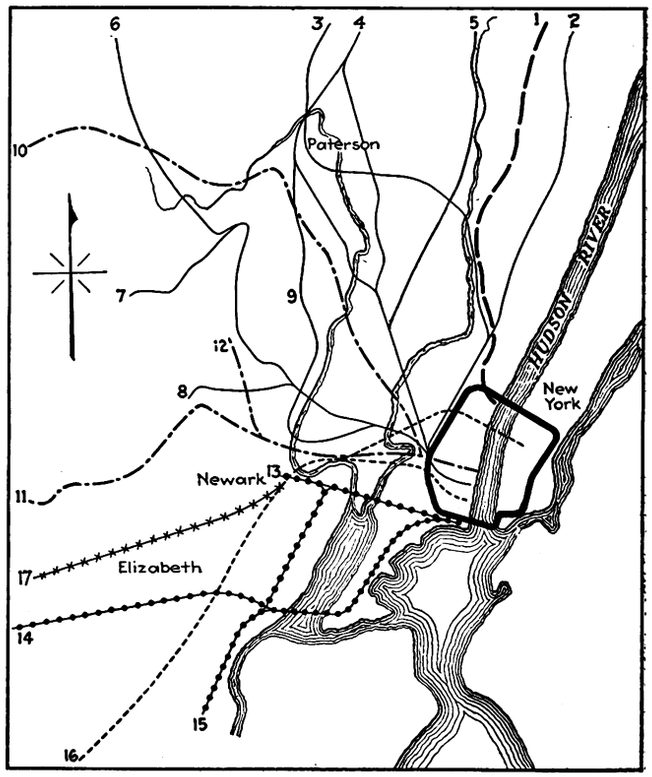
By John A. Miller, Jr.
Associate Editor ELECTRIC RAILWAY JOURNAL

FOR some years past traffic on the rail lines carrying New Jersey commuters to and from New York City has been growing steadily and existing facilities have now nearly reached the saturation point. As the traffic problems of the various steam railroads that handle this business are radically different, the development of any plan to relieve the present congestion is a complex problem. A possible solution has been suggested by the North Jersey Transit Commission in a recent report to the State Legislature, an abstract of which was published in this paper Feb. 6. From the point of view of providing the most satisfactory transportation at the least cost, however, the plan appears to be possible of improvement in certain respects.

Congestion exists on the various railroads for different reasons. In the case of the Erie Railroad, which carries the largest number of commuters of any steam railroad in this territory, the limiting factor is the twelve-track terminal at Jersey City. During the maximum half hour, 23 inbound trains must be handled on these twelve tracks, eleven of which are stub-end and one of the pull-through type. At Croxton, about 2 miles west of the waterfront terminal, the eight routes of the Erie begin to diverge. Beyond that point the track capacity is ample for present traffic and could in fact accommodate a considerably greater density than now exists. The problem of the Erie, therefore, is the enlargement of its terminal facilities. However, space is not available along the waterfront for this purpose.

In the case of the Lackawanna Railroad, which operates sixteen inbound trains during the maximum half hour, the limiting factor is a four-track tunnel under Bergen Hill. This tunnel is approximately 1 mile in length. Because the smoke of steam operation makes visibility poor no train is allowed to enter the tunnel until the leading train has cleared the opposite end. Consequently a headway between three and four minutes is the minimum which can be operated on one track. At its waterfront terminal the Lackawanna has seventeen tracks which provide ample capacity for the needs of the present and the immediate future. A substantial increase in service could be provided if it were possible to operate trains on a shorter headway in the tunnel. Some congestion, however, exists on the main line of this railroad as far west as Roseville Avenue, where the Montclair Branch diverges.

The problem of the Central Railroad of New Jersey is primarily that of getting its passengers across the Hudson River to New York City, ferries being the only means now available. The locations of its Communipaw terminal and approaches are such that increased track facilities can be provided without great difficulty whenever needed. Similarly, the problem of the West Shore Railroad is largely one of getting its passengers across the river. The site of this railroad terminal in Weehawken is so far north of the business center of New York City that a long ferry ride is involved for a large



Present Commuter Lines and Proposed Loop

Distribution of North Jersey commuters in Manhattan by means of the proposed interstate loop is complicated by the diversity of routes on the Jersey side. Altogether there are seventeen routes, not counting the Newark branch of the Hudson & Manhattan Railroad. These are:

1—West Shore Railroad.
2—Northern Railroad of New Jersey (Erie).
3—New York, Susquehanna & Western Railroad (Erie).
4—Erie Railroad—Main line.
5—New Jersey & New York Railroad (Erie).
6—Erie Railroad—Greenwood Lake Branch.
7—Erie Railroad—Caldwell Branch.
8—Erie Railroad—Orange Branch.
9—Erie Railroad—Newark Branch.
10—Lackawanna Railroad—Boonton Branch.
11—Lackawanna Railroad—Main Line
12—Lackawanna Railroad—Montclair Branch.
13—Central Railroad of New Jersey—Newark Branch.
14—Central Railroad of New Jersey—Main Line.
15—Central Railroad of New Jersey—Seashore Branch.
16—Pennsylvania Railroad.
17—Lehigh Valley Railroad.

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part of its commuters. The trackage of the terminal itself and its approaches are not now overcrowded.

In the cases of the Pennsylvania Railroad and the Newark branch of the Hudson & Manhattan Railroad, through service to New York by tunnels under the Hudson River is now provided. Extensive improvements have already been planned by these roads to facilitate the handling of their traffic between Newark and New York. With the completion of this project the Pennsylvania and the Newark Branch of the H. & M. probably will be able to handle their commuter traffic comfortably for some years to come, especially if proposed new facilities relieve the H. & M. local lines to some extent.

As the first step of an elaborate plan to relieve congestion the North Jersey commission recommends the building of a two-track interstate loop line having connections with all the commuter railroads. The route would be about 17 miles long, running north and south in New Jersey between Bergen Hill and the Hackensack River, with tunnels under the Hudson River to the Battery and to 57th Street, New York City. A low-level subway, probably under Lexington Avenue, would complete the loop. Passengers would transfer to and from the railroad trains at the intersections of these roads and the loop line. Cost of construction and equipment for this interstate loop, not including power facilities, is estimated at $194,000,000.

Statistics of present traffic, however, show that the volume is greater than could be handled on a two-track loop. During the maximum half hour 64 trains arrive at the waterfront terminals on the New Jersey side. These trains bring somewhat more than 42,000 passengers bound for New York City. Distribution of trains and passengers among the various railroads is shown in the following table:

ARRIVALS AT HUDSON RIVER TERMINALS DURING MAXIMUM HALF HOUR

Railroad	Trains	Passengers
Erie	23	17,924
Lackawanna	16	11,459
Central of New Jersey	17	6,902
West Shore	3	3,586
Pennsylvania (Jersey City)	5	2,500
Total	64	42,371

Commuter traffic is increasing at a rate of about 5 per cent per year. Before the construction of the interstate loop could be completed the number of passengers arriving during the maximum half hour would probably have increased to about 50,000. From these calculations trains operated over the electrified division of the Pennsylvania Railroad into its 32d Street Station, New York City, and on the Newark branch of the Hudson & Manhattan Railroad have been omitted for the reasons given in a preceding paragraph.

Service on the interstate loop line during the maximum half hour, according to the report, would consist of 36 trains of eleven cars each, or 396 cars altogether. Of this number of trains one-half would move in each direction, or eighteen to the Battery and eighteen to 57th Street. The report of the commission assumes that the passengers on the incoming railroad trains would divide equally between the northbound and the southbound loop trains and that with an average load of 100 passengers per car a total load of 39,600 passengers could be carried on 36 trains. At that rate the carrying capacity of the interstate loop line would be less than the present traffic.

Operation of eighteen trains per track during the maximum half hour is equivalent to an average headway of 100 seconds. This is the shortest headway which it has been found feasible to operate with ten-car trains on the lines of the Interborough Rapid Transit Company in New York City. The Hudson & Manhattan Railroad with shorter trains operates a 90-second headway during the rush hour and believes that this is the shortest headway which can be operated with safety on one track. From this it appears that the estimate of the commission represents very nearly the maximum service which can be rendered by the proposed interstate loop line.

Existing means of transportation between the waterfront terminals and Manhattan would have to be retained to care for the excess over the capacity of the loop line. That would mean that the terminals themselves would have to be retained and to a great extent the railroad operation would continue to be throttled by, the same bottle necks which limit it today. While it might be theoretically possible for some of the trains to end their trips at the transfer stations on the Hackensack Meadows, such curtailment of service would be a serious inconvenience to passengers desiring to reach the waterfront terminals to take the ferries and Hudson & Manhattan tubes.

That large numbers of commuters would prefer the present ferry and tube service to that offered by the proposed loop line seems probable. On account of the high cost of construction the report states that a 15-cent fare will be required on the interstate loop unless interest and sinking fund charges can be eliminated. Moreover, the routing is somewhat circuitous and would not deliver all of the passengers conveniently near their destinations.

Investigation by the commission showed that the ultimate destinations of the inbound railroad passengers were widely distributed. Expressed in per cent of the total number of passengers, the destinations may be classified approximately as follows:

District	East of Broadway	West of Broadway	Total
Below Chambers Street	—	—	38
Between Chambers and Fourteenth Streets	7	7	14
Between Fourteenth and 33d Streets	7½	7½	15
Between 33d and 42d Streets	6	6	12
Between 42d and 59th Streets	5	5	10
North of 59th Street	2½	2½	5
Brooklyn	—	—	5
Queens	—	—	1
Total			100

This classification is based on the findings of the commission that traffic is fairly evenly divided between passengers destined to points east of Broadway and those to points west. It is believed that the proportion is approximately constant for the different districts.

Assuming that the loop line will be convenient for all passengers below Chambers Street and for those on the east side of town above that street, about 66 per cent of all inbound railroad passengers would be brought to points within ten minutes walk of their ultimate destinations. If the other 34 per cent of the commuters used the loop line they would be compelled to transfer to some other transportation agency in New York. Moreover, the proposed route would involve a detour of several miles for a substantial proportion of the commuters. For example, a passenger on the Lackawanna Railroad wishing to reach the 34th Street

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district in Manhattan would be obliged to go north from Hoboken to the 57th Street tunnel and down again on the New York side or to go south as far as the Battery and up again to 34th Street. A similar situation would exist with regard to the Erie commuters desiring to reach the mid-town business district of Manhattan.

Use of the present west side subway in New York is suggested by the commission as a means of reaching sections somewhat remote from the route of the interstate loop, transfer from the loop to the subway being made at 57th Street and Broadway. A serious objection to this arrangement is that the section between 96th and 42d Streets is the maximum load area on the north-and-south rapid transit lines. Passengers from the interstate loop line would be compelled to board southbound subway trains in the area where the maximum load was being carried in order to reach destinations below 57th Street. They would, therefore, add to the existing congestion at its very worst point.

The existing suburban steam railway lines in New Jersey separate into seventeen distinct branches, requiring individual train service. On account of the length of these lines each of the seventeen at present has from two to three and sometimes four classes of trains —local, express and semi-express, or trains running express on the outer end of the line and local nearer the city, and vice versa. Assuming that the train service of each of the seventeen lines be of two classes, express and local, then at least 34 different kinds of trains must be run around the loop, in two directions, in order to give service to each one of the outlying stations on all of the different lines from the stations on the loop to Manhattan Island. Something like twenty minutes will intervene in the service under the heaviest rush-hour conditions to any of the outlying local stations.

In order that such a loop system be at all convenient, it must run at reasonably frequent intervals in both directions from the Meadows Transfer throughout the day for the purpose of carrying these suburban passengers to destinations on Manhattan Island. If the service is not frequent it will be unattractive. From the suburban time-tables of the New Jersey railroads, however, it will be seen that frequent service is provided during short rush-hour periods night and morning, while only a scattered service, sometimes at one-hour or two-hour intervals, is given during the rest of the day. Moreover, the habits of the people living in these suburban communities are so similar that transportation service is required on nearly all the lines at approximately the same hours. This would inevitably result in very uneven loading of the loop trains during the middle of the day. It would not be possible to render the loop service by short trains, as is usually done in the off peak, because capacity would have to be available to accommodate entire steam railroad trainloads. In the intervals between trains the traffic would be almost nothing. Additional to the objection of the lack of capacity of this two-track loop for rush hours, therefore, is its uneconomical frequent operation throughout the rest of the day.

Several of the difficulties which would be involved in the operations of such a loop, circuitous routing, a high fare, etc., apparently arise from a desire to furnish two different kinds of transportation service by a single agency. The problem of the North Jersey commuter has two distinct sides. These involve, first, the transportation of residents of suburban communities to Manhattan Island, and, second, their distribution after arrival. While it would no doubt be a convenient arrangement to make the trip from one's home to one's place of business in a single vehicle, the scattered character of the residential districts in North Jersey and the diversity of locations of places of business in New York City render such a proceeding almost impossible.

Distribution of passengers by the transportation agency which they use for the greater part of their journey is hardly feasible when the distribution must be along a line at right angles to the general direction of the railroad. A system for carrying North Jersey commuters to New York and distributing them there must necessarily have the general shape of the letter T. Experience shows that efficiency in operation of a route having this shape is almost impossible to attain. For practical transportation purposes it may be said that the resident of New Jersey who goes to business every day in New York City becomes a New Yorker after crossing the river. The problems connected with his movements about the city are the problems of transportation in New York and can hardly be undertaken by New Jersey railroads.

Possibilities of the Battery Line

A preliminary project recommended in the report of the commission to be undertaken before the construction of its interstate loop is the building of a rapid transit line from a Meadows transfer station near Croxton through the Communipaw terminal of the Central Railroad of New Jersey and under the Hudson River to the Battery. The major problems of two or perhaps three of the railroads would be solved by such a plan. The Erie could move its terminal from the waterfront to Croxton and secure as much additional track capacity as might be desired. Tube connection between the Central Railroad terminal and New York City would be provided. The West Shore Railroad could easily extend its service south to Croxton and thus secure rapid transit connection to Manhattan. Passengers desiring to reach uptown points in Manhattan could use the New York rapid transit facilities, moving in a direction opposite to the rush. If desired, through operation probably could be arranged with the subway lines now terminating at the lower end of Manhattan Island, or with the proposed Westchester subway.

Such an arrangement would be open to the same criticism on account of the circuitous routing necessary to reach uptown Manhattan, as is the loop plan. For that reason, the Battery line could hardly be considered a complete project in itself, but might better be undertaken in conjunction with a second rapid transit route to provide more direct service uptown. This could be done by continuing the line eastward from Croxton through a second tunnel under the Hudson River and across to the east side of the island, intersecting all north and south rapid transit lines. Transfer could then be made either north or south at points where capacity was available. An alternative plan would be the extension of the Fourteenth Street subway of the B.-M.T. to Croxton. In either case there seems to be no good reason why the two arms of such a system should be connected in New York to form a loop. A substantial part of the estimated high cost of the proposed interstate line is accounted for by the low-level subway under Lexington Avenue, and this would be true, though to a less degree, with a smaller loop. Resulting advantages would hardly compensate for the large outlay.

While it might be possible to arrange for service of

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the Lackawanna Railroad to terminate at the proposed transfer station at Croxton, it may be doubted if this would be a satisfactory arrangement. The present waterfront terminal of this railroad is modern in design and ample in capacity to care for traffic for some time in the future. Ferries will probably be needed for many years to take care of vehicular traffic, which is growing more rapidly than can be accommodated by the tunnels and bridges now planned. A large volume of passenger traffic can be handled by this means at little additional expense. Ferries are popular with the commuters and extremely convenient for reaching many districts on the west side of Manhattan Island. Moreover, the total elimination of ferry service would place an extremely heavy load on the rapid transit facilities and would necessitate a more expensive construction program than would be necessary if the ferries were continued.

Increased service on the Lackawanna can best be secured, it would seem, either by taking the roof off the tunnel, which would permit a closer spacing of trains, or by electrification, which would eliminate smoke in the tunnel and thus permit its division into several blocks. The latter plan would also do much to relieve congestion on the main line between Hoboken and Roseville Avenue.

Suggestions have been made from time to time that the New Jersey railroads be electrified and extended under the Hudson River directly into New York City, as has been done in the case of the Pennsylvania. Although this would be convenient for the passengers, it would involve an enormous expenditure, and would tend to continue rather than eliminate the bottle necks. Take the case of the Erie alone. To accommodate the 23 inbound trains which now arrive at Jersey City during the maximum half hour would require a four-track tunnel under the Hudson or a storage yard in New York City large enough to absorb many of the trains before they are shunted back to the yards on the New Jersey side. To be really effective this plan would require also electrification of all the eight branches of the Erie, involving heavy additional expenditures.

At best the traffic capacity of the railroads would not be greatly increased by extending their lines to Manhattan, and future expansion would be limited by the capacity of the under-river tunnels.

Consideration of these various factors leads to the conclusion that increased facilities for New Jersey commuter traffic can best be had by the construction of a new rapid transit line, similar in plan to the Battery route proposed by the commission. Another line to reach midtown New York would also be needed, but this should not be so far uptown as 57th Street, nor does it appear desirable that the two lines should be connected to form a loop.

B.-M. T. Renews Lloyd's Contract

THE Brooklyn-Manhattan Rapid Transit Company has renewed a contract with Lloyd's of London providing indemnity for losses exceeding $50,000 resulting from a single accident casualty or wreck. The amount of the premium was not announced. Travis H. Whitney, vice-president, said that the policy covered physical damages that might result to railroad property besides damage claims awarded in the courts. The contract was made a year ago. It is said the railway has never made any claims under the Lloyd's contract.

Regenerative Braking Tried on Multiple-Unit Trains

Machines Mounted on Trailer Axles Act as Boosters During Acceleration and Brakes During Retardation —Tests Being Made on Chicago Elevated Lines

BY L. M. ASPINWALL
Railway Equipment Engineer Westinghouse Electric & Manufacturing Company

WHILE regenerative braking has been in use for some years on electric locomotives operating on long, heavy grades, tests have been made recently with a view to applying this principle to multiple-unit operation. In such service the runs are generally comparatively short and the schedule speeds high, with the result that braking is started at high speeds and a large proportion of the energy taken from the line is wasted in heat at the brake shoes. On this account the application of regenerative braking offers possibilities of thoroughly beneficial returns.

Runs of ½ mile in length with braking started at a speed of 30 m.p.h. are not uncommon in this class of service. Under these conditions the energy wasted at the brake shoes is only slightly less than that portion of the energy taken from the line which is actually used to propel the car. Under such conditions it is quite evident that if a considerable portion of this wasted energy can be saved without undue complication of the equipment the proposition is worthy of serious consideration.

RAPID RETARDATION AND FREQUENT STOPS COMPLICATE THE PROBLEM

Regenerative braking on electric locomotives is a comparatively simple matter, for in this case the usual problem is to maintain a constant speed down a long grade. With multiple-unit trains operating on a high schedule speed with frequent stops the problem becomes a much more difficult one. In this case it is necessary to be able to start braking instantly at widely varying speeds, to be able to maintain a practically constant rate of braking over a period during which the speed is rapidly falling and, finally, to glide smoothly from regeneration to air braking for the final stop.

The Westinghouse Electric & Manufacturing Company has devoted considerable study to this problem, and in 1923-24 extensive tests were made on a stationary flywheel outfit with a system of regeneration which gave promise of being suitable for application to electric car service. The system was particularly suitable for two-motor, double-truck cars of the type which are common in subway and elevated service. Briefly, the system was as follows: Two axle-driven machines mounted on the trailer axles supply exciting current for the fields of the main motors during the braking period and act as motors during the period of acceleration. On account of this motoring action during acceleration these machines are designated as "boosters." The booster armatures are connected in series with the main motors during acceleration and their fields are separately excited.

The design and gearing of the axle machines are such that when motoring they add approximately 25 per cent to the tractive effort supplied by the main motors. This additional tractive effort is obtained principally from energy which usually is wasted in resistance, so that this is a gain aside from the regenerative feature. The

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tractive effort added by the "boosters" makes it possible to obtain the same accelerating rate with less energy from the line and lower duty on the main motors, thus making them more able to withstand the additional load of regenerative braking. If the motors are of ample capacity, this added tractive effort can be used to obtain a higher acceleration and a consequent increase in schedule, without any additional load on the motors or additional energy from the line.

Another outstanding feature in the system is the use of a constant time element sequence switch for bringing in the correct switches during the braking period and for regulating the field strength of the "booster." The system also embodies means for regulating the regenerative currents, for balancing the generated voltage against the line voltage and for cutting in and out the air brake so that it will act in proper conjunction with the regenerative system.

Chicago Rapid Transit Cars Equipped for Test

The tests made on the flywheel outfit were so promising that it was decided as a next step to try the system out in operation on several cars. Two standard Chicago Rapid Transit Company steel cars were equipped with regenerative apparatus so that further tests could be made under service conditions. One of these cars was operated last fall for some months on the test track of the Westinghouse company at East Pittsburgh. The results obtained during these tests were very gratifying and corresponded closely to the calculated figures. The regular equipment on the car consisted of two Westinghouse type 567-R-1 motors with a gear ratio of 17:60 and Westinghouse automatic electro-pneumatic control. The equipment added for regeneration comprised two "booster" motors, an air-operated sequence switch, four electro-pneumatic switches, two engineer's brake valve switches and several relays. The weight of the added equipment is approximately 4,500 lb. and the total weight of car with the additional equipment is about 79,000 lb. The equipment on this car is so arranged that the master controller and engineer's brake valve are handled in precisely the same manner as in the case of the ordinary non-regenerative equipment. When the master controller handle is thrown to the "full on" position the acceleration takes place in the usual manner, except that the "boosters" act as motors and assist the main motors to bring the car up to speed. When full parallel position is reached the "boosters" are automatically cut out of circuit.

When the master controller handle is thrown to the "off" position the proper connections are automatically established so that the main motor fields are excited by the "boosters" to such a strength that a voltage equal to a little more than line voltage will be generated across the motor armatures. This generated voltage is automatically maintained within fixed limits as the car drifts to lower speeds, so that this "standby" position is maintained ready to start braking at any instant.

When braking is desired the engineer's brake valve handle is moved to "service" position and the desired reduction in brake pipe pressure is made in the usual manner. The moving of the brake handle to "service" closes a pair of contacts in an attachment which is mounted on top of the engineer's brake valve in place of the usual handle guard. This action closes the line switches and throws the motors onto the line. At the same moment that the line switches are closed the fields of the "boosters," which are exciting the main motors, are strengthened by cutting out a certain amount of resistance and the sequence switch which governs these fields starts to revolve at a constant speed.

The result of these operations is to start regenerative braking immediately when the handle is moved to "service" position. These take place before the air brake has had time to come into action. The current which is regenerated to the line closes a series relay and blocks off the connection between the brake cylinder and the triple valve so that no air passes to the cylinder in spite of the fact that a reduction has been made in the brake pipe pressure. The sequence switch as it revolves at constant speed gradually cuts out resistance in the "booster" fields and at the same time carries the motor connections through a bridging transition from the parallel to a series combination, with the result that the regenerative braking is maintained at a practically constant rate down to a speed of approximately 10 m.p.h. At a speed of approximately 12 m.p.h. the air brake is automatically cut in, and when the pressure in the brake cylinder has reached a given value the regenerative braking is cut out automatically. The pressure attained in the brake cylinder at this time is governed by the reduction which was made in the brake pipe pressure at the time that regenerative braking was started.

During the tests on this car the transition from regenerative to air braking was made so smoothly that it was hard to detect when the change took place without watching the instruments which were in circuit. The final spotting of the car is taken care of in the usual way by manipulating the air brake. The connections on the car are such that if regenerative braking fails to act for any reason, the air brake comes into action in the regular way. The emergency or the engineer's brake valve is left intact so that air braking is always obtained on this position.

Substantial Savings Can Be Made by Regenerative Braking

The proportion of energy which can be returned to the line naturally varies with the length of run. Assuming a yearly mileage of 40,000, runs averaging ½ mile in length and power at 1.5 cents per kilowatt-hour, the value of the power returned per car would amount, in round numbers, to approximately $550 per annum. The indications are that a net reduction in energy consumption of approximately 25 per cent may be obtained by the adoption of regeneration in typical elevated railway service.

Aside from the question of energy saved by the use of regenerative braking, the saving in brake shoe maintenance and wheel wear are items of considerable importance. It seems reasonable to expect that the life of brake shoes on a multiple-unit train equipped with regenerative control would be increased four or five times. A reduction in brake shoe dust, which is an enemy to electrical equipment, should make a trend toward a reduction in the general equipment maintenance.

The first car which has received very elaborate laboratory tests and a second car equipped with identical apparatus are being tested under service conditions in typical Chicago Elevated service. It is expected that some interesting data will be forthcoming shortly from these tests which will be of much value to operators of rapid transit lines.

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The Readers' Forum

EDITOR'S NOTE

Comments on the recent report of the North Jersey Transit Commission and the analysis of it published elsewhere in this issue were asked for from a number of engineers and transportation men who are keenly interested in it. Several replies are published below. This paper will be glad to receive and publish any other helpful comments on this important subject.

All-Rail Delivery of Passengers in Manhattan

ERIE RAILROAD

NEW YORK CITY, March 3, 1926.

To the Editor:

Referring to your request for comment from me concerning the proposed rapid transit plan for north Jersey, I may say that nothing more important confronts that state today than the problem of transportation of the suburban population to New York City. If the state continues to grow as it has in the past, a comprehensive scheme something like that suggested in the report of the North Jersey Transit Commission must be adopted.

The Erie Railroad has reached its saturation point in the handling of the vast army of commuters morning and evening. Passenger trains operate on an 88-second headway into the Jersey City terminal during the rush hour and the station tracks are fully occupied. Waterfront property at Jersey City and at Weehawken is an essential part of the Erie Railroad system, just as much as the tracks in Illinois, Indiana and the other states traversed. A terminal cannot be developed in Jersey City of sufficient size to take care of the future commuter business without the loss of freight facilities, on which the railroads have to depend for a living.

There is only one practical thing to do. That is to create an all-rail delivery of passengers to Manhattan Island. The destinations of passengers are widely scattered, of course, but the greater preponderance are destined to the lower end of the island. With the development of the 42d Street zone, with its great office buildings and with the intermediate cloak and suit development, it will be physically impossible, however, to handle about 35 per cent of the passengers without change.

An outer station in the vicinity of Croxton is practical. A station at that place should be built on the loop plan with a connecting subway system for the distribution of passengers to the downtown district and to the district around Fourteenth Street and to the north. This distribution might be brought about by extension of the Hudson & Manhattan lines to the station at Croxton and construction of additional tracks under the river between Exchange Place, Jersey City, and the Hudson terminal, as well as additional tracks uptown when needed. Probably an extension could be made into the 42d Street zone.

Another scheme would be the operation of the New York subways from a point near the Battery across to the Central Railroad of New Jersey station and thence through a section of Jersey City susceptible of great development to the Croxton station and back across the river to Manhattan near Fourteenth Street. Downtown subway trains in the morning could thus be utilized for an uptown load after leaving the distributing station on the New Jersey side. Southbound subway trains which were emptied at Fourteenth Street could be sent across to the Croxton station to pick up a downtown load.

To my mind, a loop from the centralized station to 57th Street is too far north. I do not desire to comment on the various loop lines outside of the centralized station in New Jersey other than to say that north Jersey is pretty well provided with passenger lines now, and until such time as their capacity has been reached and some scheme worked out to finance their electrical operation, we can afford to wait for this development. When such time arrives, if certain of these lines are electrified, trains can be run through to destinations in New York City without change at the so-called outer stations.

J. J. MANTELL,
Vice-President New York Region Erie Railroad.

Analysis Will Stimulate Discussion

THE NORTH JERSEY TRANSIT COMMISSION

HOBOKEN, N. J., March 2, 1926.

To the Editor:

Mr. Miller's article impresses me as a keen analysis of the situation and as an illuminating and fresh point of view on a very difficult subject. Its publication can only result in salutary stimulation of discussion.

In the main, my comment is that Mr. Miller possibly has not taken the ultimate conditions into account. The North Jersey Transit Commission is aiming at more than assisting present commuter transit and providing intracity communication in metropolitan New Jersey. It is endeavoring to contribute to an ultimate scheme of regional transit in the whole metropolitan area on both sides of the river.

Perhaps, too, he has not considered that our complete plan suggests river crossings such as those at 41st and Fourteenth Streets, which are not properly part of the proposed north Jersey system, or, also, that we are figuring upon transfer of the majority who take the west side subways at a point in lower Manhattan rather than at 57th Street, where no provision is made for such transfer.

His forecast of the extent to which the capacity of the proposed interstate loop will immediately be absorbed is not susceptible of disproof, being based on a judgment of probabilities. But we cannot imagine the entire number of passengers arriving at the waterfront crowding into our lines. The Hudson & Manhattan will always carry a respectable share and there are factors other than the commuter which will involve the continuation of ferry service for many years.

Our optimism has never been equal to the hope of a system adequate at once to make the ferries unnecessary. Our system would be the beginning. As facilities increase, the curtailing of ferry service would gradually follow. I may say that we were only deterred from recommending, now, eight lines under the river by the financial necessity of keeping down the initial cost.

From the ultimate point of view, personally, I feel there is not much difference between any of the plans proposed. The more river crossings, the better the distribution, but the more crossings, also the greater the cost. Over a long period, undoubtedly, river crossings will multiply.

B. H. SAUNDERS,
Chairman.

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Alternative Methods of Handling Commuter Traffic

PARSONS, KLAPP, BRINCKERHOFF & DOUGLAS
NEW YORK, March 11, 1926.

To the Editor:

In reply to your request for an expression of opinion upon your analysis of the North Jersey Transit Commission's report, I would say that I am glad to see a technical discussion of the suburban problem undertaken. I hope you will give our Westchester plan similar treatment.

The feature of your article and the Jersey commission's plan which most interests me is the broad basic question of whether a plan based upon the loop idea entering Manhattan at the Battery and leaving at 57th Street or 125th Street is sound as compared with a number of direct east and west lines.

I made an analysis of this New York metropolitan transportation situation in a paper prepared at the request of the American Society of Civil Engineers in 1920. I arrived at that time at the conclusion that to encourage and promote a more uniform distribution and development of the wider New York metropolitan district a system of east and west and north and south lines traversing Manhattan Island and the metropolitan area should be built. The thought was to encourage wider distribution of the factory, office and other employment centers on Manhattan Island, Long Island and in New Jersey by providing station stops at intervals along these east and west lines. These same lines would deliver people by a direct route to their Manhattan destination and supply transfer to all north and south lines on Manhattan.

Subsequent study made for the Westchester commission convinces me still further of the soundness of this basic idea of transit development for the central part of the metropolitan district.

If we can combine direct routing of passengers to their employment places with a system of lines also tending to lessen Manhattan congestion, we will be both "taking people where they want to go by the shortest route and encouraging them to go where they ought to go at the same time."

The Westchester plan in order to be financially possible must consist in its first step of a single line delivering its passengers to points along the north and south axis of Manhattan.

Instead of the interstate loop of the Jersey commission's plan, the Westchester plan proposes an extension of the Westchester tracks south from their terminal below the City Hall, Manhattan, via the Battery and the Jersey Central to the Meadows Transfer. All the functioning of the south end of the interstate loop and distribution north along the axis of Manhattan would be provided by carrying the Jersey passengers between the Meadows Transfer and southern Manhattan with the Westchester trains and such loading will be on empty trains in the reverse direction to their own traffic.

The extension, as we propose, of the Interborough 42d Street tube to New Durham and on the surface to the Meadows Transfer will serve more conveniently the Jersey traffic seeking the shopping, theater and midtown business district than the 57th Street route of the interstate loop. This takes the place of the north end of the loop by extension of an existing line and the use of equipment now loaded only one way.

The reverse direction use of the Westchester line would save millions of dollars for the long Lexington Avenue side of the interstate loop. Instead of separate equipment required by the initial plan of operation of the interstate loop, the car capacity would, under the Westchester plan, be supplied by the B.-M. T. on its Fourteenth Street route, the Interborough on its Queensboro route and Westchester by the extension of its trip to the Meadows Transfer.

The sums of money required for this type of transportation are so great that it appears to me it is vital to load all trains in both directions and extend present lines when possible, so as to avoid duplication of expenditure. The interstate loop trains would be loaded in only one direction and take a long (17-mile) circuitous route.

I have commuted from Jersey to Manhattan for the past eighteen years and have used at times practically every steam railway, ferry and tube system. My American Jersey commuter mind does not take kindly to riding on a long belt line, à la London, or Paris. When we Jerseymen leave our "beautiful suburban homes" to earn our daily bread on Manhattan Island the shortest, most direct way in and out suits our ideas best. I am also sure New York residents and transit officials do not want us riding up and down their narrow congested island if it can be avoided.

HENRY M. BRINCKERHOFF.

Commission Plan Has Two Objects

RIDGEWOOD, N. J., March 2, 1926.

To the Editor:

The North Jersey Rapid Transit Commission is particularly anxious for criticisms of the plan for improved transit for the New Jersey area as outlined in its recent report, and the members fully recognize the responsibility resting upon them in attempting to solve the very complex problem of present and future transit.

We had in mind two very definite purposes in the plan outlined; first, to distribute the commuter in Manhattan as near as possible to his destination; second, to afford an opportunity for travel between the principal points in north Jersey with the least possible inconvenience.

Mr. Miller's criticisms are constructive and may call forth other comments and suggestions which will be helpful. I think, however, that he has overestimated the number of persons who will transfer at 57th Street on the west side for destination south of 57th Street. It is our belief that passengers for the west side will travel through the Battery tunnel and change at Rector Street for points north of that point and south of 57th Street on the west side, thereby traveling with the lighter flow of traffic.

It is also well to consider that it is the expectation of the commission that the Hudson & Manhattan will make connection with the Meadows Transfer, as it was never intended that the H. & M. should be relieved of all but the Newark traffic.

Your attention is also called to the very excellent report of Mr. Lewis to the Regional Plan Committee,* which has just been received. From a hasty reading this report seems to be an indorsement of the plan of the North Jersey Commission.

DANIEL A. GARBER,
Vice-Chairman North Jersey Transit Commission.

*An abstract of this report appears on page 458.

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Association News & Discussions

Improving the Pull-In Record at New Orleans During 1925*

By Frank T. Dawkins
Engineer Rolling Stock and Shops Department, N. O. P. S., Inc.

IN DECEMBER of last year a record of 636,000 miles per pull-in was achieved by the rolling stock and shops department of New Orleans Public Service, Inc. This enviable record, while unique and showing the possibilities of the systems which we have installed, should not be taken as a standard. However, our record for the year 1925, with 190,644 miles per pull-in as compared with 130,725 miles per pull-in in 1924, shows conclusively that the system we installed and which will be outlined in this paper has accomplished wonderful results.

The first step is the checking over of the car by the foreman of the shop and the engineer, who make complete notes of conditions in order to be in a better position to direct the work and have a check against the final test of the car. The previous performance data of this car are of great importance in giving the car an accurate inspection. These data are furnished by the different reports from carhouses.

The car is run over one of the car hoists and a crew of men placed on it. Motor leads are disconnected and the car body is raised from the trucks. The crew then runs the trucks out from under the car and removes motors from the truck. The motors are sent to the motor assembly room by means of a traveling electric crane. The truck is given a thorough inspection after it has been well cleaned. If found in a good condition, except for tightening of bolts, it is supposed to be placed back under the car. If the trucks are found in a bad condition, the brake levers and rods shall be removed, holes rebushed with case-hardened bushings and case-hardened pins used in all places. Springs shall be thoroughly inspected and, where necessary, replaced. In general, all worn parts are to be replaced with new and loose parts tightened.

When the motor is received in the motor assembly room it is gone over by the engineer. The resistance of fields and armatures is checked and the condition of bearings, brush-holders, pinions, motor leads, motor shells, etc., is examined. The motor is then taken apart and the armature and fields are sent into the armature and field department for dipping and baking. If bearings are worn to such an extent that it would be harmful to the motor to let them out for 40,000 miles more, they are sent into the bearing department. A difference of 0.020 in. between bearing and shaft is the limit of wear, this being determined by micrometer measurements. If any parts on the motor frame housing or axle caps have flaws or are worn, they are sent into the machine shop for repairs.

When the armatures and fields are received in their department they are given resistance, short and open circuit tests and a ground test, and if found all right their dressings are removed. They are placed over the dust collector opening in the room and all dust removed from them. They are then placed in an oven to preheat. After the specified time for preheating, they are taken out and dipped in insulating varnish long enough to become saturated. They are then replaced in the oven for the final baking, after which they are removed from the oven, allowed to cool and final dressings put on. In order to give the field coils a better treatment, impregnating tanks are being designed by the engineering department. The commutator is turned and slotted and it is given its final test for opens and shorts and a 1,500-volt ground test by the engineer. Bearings are fitted on and they are sent into the motor assembly room. The bearings that require rebabbitting are cleaned in a solution of hot Oakite and water to remove all grease and dirt. They are then placed in the melting out furnace and all babbitt removed from bearing shell.

Next the shell is dipped in acid and given a thorough cleaning and dried off. It is then swabbed with zinc chloride and all surfaces not to be tinned are coated with a solution. Following this it is dipped in a second tank containing half and half solder, which is kept at a temperature of between 770 deg. and 824 deg. F., by means of an electric pyrometer. This operation is repeated once more. The bearing is then ready to be babbitted. If the bearing is poured at once, the heat from the tinning is sufficient for the pouring operation, but if allowed to remain for some time it must be heated again. The bearing shell is then mounted on a mandrel and babbitt from a third tank poured into the shell by means of a self-skimming ladle. The babbitt is kept at a temperature between 860 and 900 deg. F. by means of an electric pyrometer.

After the armature and fields have been received back in the motor assembly room, the motor is ready to be assembled. The motor shell is cleaned thoroughly and the inside is given a coating of air drying insulating varnish by means of a spray gun. The fields are placed in the motor shell and all field connecting cables are placed so they cannot by any means rub against the shell. Next the armature is placed in the shell, all housing bolts tightened, axle bearings fitted and if the old pinion is in good condition and shows no flaws it is placed back on the motor. The motor is then placed on the test floor and given its final tests—resistance, ground test, low-voltage running test and load test by the engineer. The motor is painted and is ready to be placed on the truck. Care is taken that the pinion and gear mesh correctly to eliminate as much noise from this source as possible.

After the electrician and carpenter have thoroughly inspected the car and all of its accessory equipment, the motor is placed on the truck, gear cases bolted up and axle collars placed in position. The trucks are then run under the car, which is lowered. Motor leads are connected and placed in spreaders and brake rods connected. The brake equipment is then gone over. Extreme care is taken in inspecting and overhauling this equipment and foundation brake rigging. The compressor is removed from the car and sent into the compressor room for overhauling. A repaired compressor is placed on the car. The compressor sent in for overhauling is opened up, field and armature removed and sent into the field and armature department, where they are given the same test and overhauling that the motor armature and fields received. All parts of the compressor are thoroughly cleaned and bearings are tested for wear. If in need of repair, they are removed and replaced with new or rebabbitted bearings. All loose or defective bolts are replaced, valves removed and cleaned, vent cleaned out, back head and piston removed, cylinder cleaned, reassembled and tested for leakage. The compressor is then reassembled, refilled with oil and given a performance test on the bench for rate of pumping up to capacity and pressure. If the cylinder is badly worn the compressor is sent into the machine shop, where cylinders are bored, bushed up and finished to standard size. A careful inspection is given to all other items of brake equipment and they are cleaned, adjusted and replaced when necessary.

Trolley wheels and harps are properly lined up and lubricated, the trolley pole inspected, the trolley base thoroughly gone over and lubricated, and, if in need of repair, it is removed and replaced with an extra one. The car is then ready for its final inspection, which is made by the engineer. The resistance of all car wiring, motors and resistors is taken by means of a Kelvin bridge ohmmeter. This resistance is checked against standard resistance for this type of equipment and if found off, it is checked back to its source and repaired. A variance of 5 per cent is allowed each way. The cable, wiring

*Abstract of paper presented at annual meeting of Electric Railway Association of Equipment Men, Southern Properties, held at Mobile, Ala., Feb. 24-26, 1926.

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and controllers are given a 1,250-volt insulation test. After all electrical equipment has been checked, the air equipment is gone over and checked against its standards. The trucks and car body are then given a final inspection and the car is run out on the line for trial. It is then cleaned and sent back to the carhouse. After it is received there it is inspected for hot journal, axle brasses and armature bearings before it is placed back in service.

In this overhauling system a complete set of records is kept of all the cars, their operating condition, equipment and data pertaining to their road performance previous to this overhauling period, so that when the car is received for overhauling its performance may be known in giving it the required test.

Advantages of Electric Drive for Gasoline Buses*

By J. C. THIRLWALL
Special Railway Engineer General Electric Company

DURING the past ten months more than 300 large-capacity gasoline buses equipped with electric transmission have been put in operation. Their operation, in Philadelphia, Albany, Atlanta, Kansas City and Miami, has already demonstrated a number of very positive advantages over the ordinary type of mechanical drive using clutch and transmission gearing.

A long series of road tests on a sample equipment had indicated that it should be possible, with electric drive, to operate materially higher schedule speeds in frequent-stop service; to reduce maximum engine speed and total engine revolutions in such service; to provide greater comfort and safety to the passengers; and to relieve the driver of a considerable part of the physical and mental fatigue incident to repeated shifting of gears. The actual operation of the fleets that have been similarly equipped have proved that our conclusions were well founded.

In both Philadelphia and Albany, schedule speeds decidedly faster than it has been possible to maintain with the old mechanically-driven buses are being made with the gas-electric types, the increase being in the neighborhood of 20 per cent for actual running time, and more than 10 per cent in miles operated per crew-hour, which includes all layovers. In both places public appreciation of the speed, smoothness and quietness of the new buses has been shown by letters of commendation and by a gratifying amount of riding.

Several factors contribute to the ability of gas-electric buses to make higher average speeds in city service. Of chief importance is the elimination of the time lost in shifting gears during each acceleration or on grades. An expert driver, trying to make a fast schedule, can shift gears and let the clutch into complete engagement in about 1½ seconds; the average driver, trying to avoid jerking the bus and clashing gears, takes from 2½ to three seconds per shift. On level runs with four-speed transmission, drivers usually start on second, and have three shifts to make at each acceleration, which consume at least four to five seconds and usually seven to eight seconds. During these intermissions, not only is the engine doing no useful work but there is an actual retardation of bus speed.

To make up for these sags in the acceleration curve, altogether too many drivers will race their engine up to dangerous speeds in second or third so as to get the benefit of high power output from the engine and high tractive effort at the rear wheels. Moreover, unless the engine speed is brought up higher than is safe in third gear, its speed when starting on high gear is so low as seriously to reduce the rate of acceleration. These features are inherent in mechanical transmission where the engine speeds are directly proportional to the revolutions per minute of the wheels, and in each gear position the engine speed and its power output must climb from a relatively low point to its more efficient range.

With the electric drive the characteristics of the generator and motors are such that the engine can be brought in less than one second from idling to high output speed, and from there on up to maximum safe output with no intermissions or lag. The result is operation at the most efficient part of the speed curve, a more constant power output and a very appreciably higher rate of acceleration for the bus.

In actual service, tests show that on either the Fageol or Yellow coaches, the maximum engine speeds attained are about 1,700 r.p.m. (this being on long runs at full bus speed, or in climbing along severe grades); and normally in frequent stop service, maximum speeds of not more than 1,500 r.p.m. Similar tests with mechanical drive, when attempting to maintain similar schedules, showed maximum engine speed of from 2,000 to 2,600 r.p.m. in the intermediate gear positions.

The torsional strains during acceleration on the engine, chassis, clutch and gearing are recognized as contributing to high maintenance costs, and the surges of torque and changes in cylinder pressures due to too rapid clutch engagement are a factor in cracking the fuel and causing knocking due to explosive combustion. The lack of such torque surges in the electric transmission permits of the use of higher engine compressions on advanced sparks and increases its power and efficiency. Without change in compressions, the fuel consumption in city service is approximately about the same for either drive. With higher compressions, as shown by recent tests reported by Mr. Froesch, assistant engineer of the Mack Company at an S.A.E. meeting on Nov. 14, the miles per gallon at five stops per mile or more actually are greater with the electric drive, despite its added weight. According to the same authority, even in purely interurban service there was a difference of only 10 per cent in gasoline consumption in favor of the mechanical drive.

The period of operation is too short, as yet, to make available any figures on relative maintenance. However, the Philadelphia Rural Transit Company and the Capitol District Transportation Company have doubled their inspection period with their new buses, and considerably reduced their garage expense.

In conclusion, all the experience to date bears out our claim that the use of electric drive on buses will enable faster schedules to be operated at reduced costs and will improve the comfort and safety of the passengers and of the drivers, and that these positive advantages far outweigh the relatively small increase in investment for buses so equipped.

*Abstract of paper presented at annual meeting of Electric Railway Association of Equipment Men, Southern Properties, held at Mobile, Ala., Feb. 24-26, 1926.

Great Lakes Cruise for C.E.R.A. Meeting

SAILING over the Great Lakes the Central Electric Railway Association will hold its midsummer meeting on board the steamer *South American* on June 28-July 2. The itinerary as adopted tentatively follows:

Monday, June 28:		
	Leave Buffalo	9:30 a.m.
	Arrive Cleveland	9:30 p.m.
	Leave Cleveland	11:00 p.m.
Tuesday, June 29:		
	Arrive Toledo	7:00 a.m.
	Leave Toledo	8:00 a.m.
	Arrive Detroit	1:00 p.m
	Leave Detroit	2:00 p.m.
	Pass Port Huron	7:00 p.m.
Wednesday, June 30:		
	Arrive Mackinac Island	12:00 noon
	Leave Mackinac Island	8:00 p.m.
Thursday, July 1:		
	Arrive Harbor Springs	7:00 a.m.
	Leave Harbor Springs	5:00 p.m.
Friday, July 2:		
	Arrive Benton Harbor	7:00 a.m.
	Leave Benton Harbor	9:00 a.m.
	Arrive Chicago	1:30 p.m.

Stopping at Mackinac Island Wednesday noon the entire afternoon will be available for golf or trips around the island. There are two golf courses, both available for members. The boat will reach Harbor Springs in time for breakfast Thursday. The Weguetonsing Golf Club has made available two 18-hole courses about five minutes from the dock. There is a third 18-hole course at Harbor Point. For those who do not care to play golf the steamer will proceed down Traverse Bay to Traverse City, stopping there about two hours and then returning to Harbor Springs for the golfers.

The *South American*, which has been used for similar meetings before, has been entirely rebuilt and improved. While berths are available for 500 passengers, it is the intention to limit the number on this cruise to 350. The total cost of the trip including stateroom and meals will be from $35 to $45, depending on the starting point. Children five to twelve years of age will be carried at half fare. Formal notice of the program will be sent out about April 15. This preliminary announcement will make it possible to make up parties for the cruise.

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American Association News

Cleveland for 1926 Convention

CLEVELAND, OHIO, has been selected for the 45th annual convention of the American Electric Railway Association and affiliated bodies and the manufacturers' exhibit to be held in connection therewith. The dates will be Oct. 4 to 8, inclusive. The charge for space has been fixed at 75 cents per square foot. This was decided at a meeting, held on March 8 by the special sub-committee of the executive committee appointed to act on the recommendations of the committee on location. Those present were C. E. Morgan, chairman; C. R. Ellicott, E. P. Waller, J. H. Hanna, L. S. Storrs, J. W. Welsh and F. C. J. Dell.

The recommendation of the committee on location in favor of Cleveland was made after a careful survey of conditions in that city and Atlantic City, where the convention was held last year. Sub-committees visited both places and obtained first-hand information.

It was found that in the case of Atlantic City the primary difficulty was the lack of space on Young's Million Dollar Pier to take care of the total requirements for the exhibit. A second difficulty encountered this year was the refusal of the Million Dollar Pier management to permit heavy machinery or operating exhibits on the ballroom floor, even though a protecting temporary floor were installed.

To provide 20,000 sq.ft. additional space a temporary building was offered directly across the boardwalk from the pier. This would probably have had to be devoted to the bus exhibit and would therefore have encountered the same criticism as last year to the effect that the delegates would not visit it as extensively as the main exhibit, and that it partook of the nature of a side show. The rental for space on the pier charged by the management as well as the cost of the temporary building represented a substantial increase over last year.

In Cleveland the public auditorium provides an exhibit area of 52,000 sq.ft. net in a building designed with all the equipment and facilities required by exhibitors. In addition the Cleveland convention committee proposes erecting an annex to this building having a net area of 74,000 sq.ft. The plot on which the auditorium and annex are located also provides an open air space of 7,200 sq.ft. where 1,500 lineal ft. of car tracks can be placed to hold exhibits of cars, and other outside track tools and equipment can be exhibited in actual operation. The Cleveland Railway will install temporary tracks and connect them with its own system and also with the siding from the New York Central tracks immediately adjacent to the auditorium plot.

The auditorium and annex will give practically unlimited space for exhibitors with all facilities required and without restrictions as to size and weight. The open air space immediately adjacent to the auditorium will provide exceptional opportunity for a street car exhibit and for the demonstration of track tools, steam shovels, digging machines and other outside construction equipment. The cost of installing exhibits, particularly heavy machinery, track tools and street cars, will be far less than at Atlantic City since they can be brought directly into the exhibit space on their own power if necessary, over the Cleveland Railway or the connection to the New York Central siding.

The central location of Cleveland should result in lower transportation costs for most of the delegates, and the hotel rates are materially less than at Atlantic City. The cost for space has been fixed at 75 cents per square foot, which is the same charge the committee estimated would be necessary at Atlantic City this year, although it is 10 cents higher than the cost for space last year. This increase is necessary because of the cost of erecting the annex, but in the event that any appreciable surplus remains after paying the expense of the convention and exhibit a pro rata refund will be made to exhibitors.

The convention committee of the Cleveland Chamber of Commerce will provide between 2,700 and 3,000 rooms, of which 88 per cent will have baths, in the leading downtown hotels. These hotels are all within a few minutes walk of the auditorium, which is located in the heart of the city. The committee believes that through the intermediary of a local hotel committee adequate accommodations can be allotted to all delegates. The hotels have been instructed not to make reservations directly with delegates. Suitable blank forms will be sent out in the near future by the hotel committee, which will handle all reservations.

A local convention committee consisting of leading Cleveland citizens, including John J. Stanley, president of the Cleveland Railway; City Manager W. R. Hopkins and others, will stand sponsor for providing all of the facilities and equipment and the making of the necessary arrangements for the holding of the convention and exhibit.

Space applications and diagrams showing the exhibition layout of booths will be ready to go in the mail June 1. Thirty days will be allowed members in which to file requests for display space.

For information regarding exhibit space communicate with Fred C. J. Dell, director of exhibits American Electric Railway Association, 292 Madison Avenue, New York City.

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 17-18—Central Electric Traffic Association, Portage Hotel, Akron, Ohio.

March 17-18—Illinois Electric Railways Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

March 25—New England Street Railway Club, 26th annual banquet, Copley Plaza Hotel, Boston, Mass.

March 29-31—National Conference on City Planning, St. Petersburg, Fla., April 1—West Palm Beach, Fla.

April 2—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8:00 p.m.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Subjects and Meetings

AT A MEETING of the committee on subjects and meetings of the American Electric Railway Association, held in Chicago on Feb. 25, tentative plans for the annual convention program were discussed. Members in attendance were J. P. Barnes, chairman; W. A. Draper, L. S. Storrs, J. W. Welsh, H. L. Brown, C. R. Ellicott, Thomas Fitzgerald, M. B. Lambert, C. L. Van Auken and Charles Gordon representing Morris Buck.

It was decided to follow the procedure adopted last year of sending out committee reports in advance and limiting the time taken on the convention floor to brief abstracts by committee chairman. In this way it is planned to concentrate the program on outstanding topics of major importance to the industry. Various subjects were considered and a tentative program was discussed. It is expected to have this in more complete form before the next meeting.

1925 Proceedings Distributed

PROCEEDINGS of the American Electric Railway Association and its affiliated associations for 1925 were distributed to members in February. All railway member companies should have received a complete set of these proceedings covering the American, Engineering, Transportation and Traffic, Accountants, and Claims Associations. Manufacturer member companies should have received copies of the American, Engineering and Transportation and Traffic Associations' proceedings. Executive Secretary J. W. Welsh states that any member company which has not

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received these volumes should communicate immediately with association headquarters.

Heavy Electric Traction

PROGRESS reports were considered at the second meeting of the committee on heavy electric traction of the engineering association held at headquarters on March 4. Those present were: H. F. Brown, chairman; J. M. Bosenbury, vice-chairman; Morris Buck, secretary; L. S. Billan representing J. H. Davis, H. C. Griffith representing J. V. B. Duer, J. O. Madison, M. W. Manz, J. C. Davidson, J. T. Hamilton, Homer Cross representing L. S. Wells, and G. C. Hecker of association headquarters.

It was felt that standardization should be taken up with all the interested parties so that an agreement can be reached as to what material should be included. It was also the sense of the meeting that so far as possible assurance should be obtained from operating companies that they will adopt the standards.

The sub-committee on track and third rail bonds has held two meetings. It is reviewing standard bonding practice and preparing a tentative standard procedure for measurement of bond resistance. In the discussion which ensued Mr. Bosenbury suggested that a tabulation of the resistances of standard rail sections be included as part of the scope of this subject. The carrying capacity of the angle bars is of material importance depending upon their type, the number of bolts and the conditions. According to Mr. Manz, it is difficult to separate the current flowing through the bond and the angle plate in the ordinary methods of testing, making it next to impossible to determine accurately the resistance of the bond itself when in service. It was agreed that the subject of rail resistance be added to the assignment of this sub-committee.

Mr. Brown reported that the status of the bibliography of heavy electric traction is under consideration by the executive and policy committees of the American Association.

Chairman Armstrong was unable to be present, and no report of the sub-committee on branch line electrification and self-propelled cars was presented. It was pointed out, however, that the interest in gasoline, gas-electric and Diesel-electric cars and locomotives demands that full mention be made of them in the sub-committee report.

A report from Chairman Daus of the sub-committee on articulated trains was read. In it he stated that a letter had been sent to several equipment superintendents requesting information. It was felt that in view of the interest in the subject, all information possible should be made available in the report of the committee.

Data on locomotives, multiple-unit cars and electrified mileage is being revised, particularly to eliminate errors which were found in the tabulation last year, according to Mr. Buck, chairman of the sub-committee.

At the luncheon following the meeting, President Charles Rufus Harte of the Engineering Association spoke regarding the proposal to send letters on standardization to railways. He feels that the matter should be on a broader basis than that of a single committee only. He is going into the matter thoroughly in connection with the substitution of letter ballots for voting on the floor of the convention. This would include consideration of standards proposed by all committees. It is desirable to have greater support from the member companies in the use of standards, particularly if manufacturers are to be asked to produce material according to them.

Metropolitan Section Discusses Transportation Methods

"FURNISHING TRANSPORTATION" was the subject at the meeting of the Metropolitan Section of the A.E.R.A., held at the Engineering Societies Building, New York, on the evening of March 5.

The principal paper was by W. B. Wheeler, superintendent of transportation Third Avenue Railway System. Sketching the various forms of transportation, he showed that the street railway has a definite place and is not likely to be abandoned. He called the attention of his hearers particularly for the need of a man to keep interested in his work, as otherwise he cannot be wholly efficient. Good feeling between the various departments was also declared essential to the success of an organization.

Discussing this paper, S. S. Hamilton, assistant to superintendent of transportation Brooklyn City Railroad, said that in the metropolitan district the essentials to satisfactory service are sufficient cars to accommodate all desiring to use the service, regular intervals between cars, a type of car that is up to date and clean, and courteous employees who give a little thought to the comfort and wants of their passengers. Mr. Hamilton pointed out some of the difficulties of trolley car operation in the congestion of New York City.

M. J. O'Connor, superintendent of transportation New York Railways, also stressed the troubles from street congestion. The cost of living is increased for the average New Yorker some $44 due to this cause alone, according to the Sage Foundation, he said. The conditions are so bad that his company operates only about 90 per cent of its schedules.

Street Car Operation in Manhattan Difficult

Practically all of the surface cars in the Borough of Manhattan use the conduit system, said the speaker. With this system contact rails, cables, etc., are concealed under ground, and notwithstanding regular inspections made by trained men, trouble is experienced from short circuits due to nuts, bolts, skid chains, tire irons and numerous metal pieces that fall from passing vehicles which become lodged in the conduit, and at some time or other come in contact with the conductor rails, or, if they do not fall into the conduit, obstruct the slot.

The delay report for the month of October, 1925, represents what might be called normal conditions. This report is based on delays of five minutes duration or longer. Slot obstructions caused 31 delays, or a total of 601 minutes. Plows were charged with 86 delays, or a total of 871 minutes. The plow, which corresponds to the trolley pole on the overhead system, is quite a source of trouble. These failures are not due to material or workmanship, but solely to the conditions peculiar to conduit operation.

Accidents, car troubles (other than plows), carelessness, construction work, fires, parades and miscellaneous delays of minor nature caused 386 interruptions to service, or a total of 3,395 minutes.

Under the modest heading "Blocking by Vehicles," we have the staggering total of 1,300 delays or a total of 9,481 minutes, or expressed in another way, 73 per cent of the interruption to our service is caused not by broken-down trucks but by congestion of traffic, for the most part on lower Manhattan south of 59th Street. Delays in this classification are increasing from month to month and constitute a real danger, not alone to passenger carrying vehicles but to all forms of surface transportation as well.

The street railroads are also paying the freight. Our bill for overtime for platform men amounts to approximately $1,000 a month. This sum is paid, not for extra service to encourage more business, but for time lost in traffic holdups and is a total loss. From March 17, 1925, to Jan. 16, 1926, it has been estimated that 400,000 car-miles were lost owing to the low speed in getting through the congested parts of the city. Figure 65 miles to a car and you will get an idea of the service lost to the traveling public.

Many remedies have been suggested and some adopted, such as one-way streets, widening of thoroughfares, control of moving traffic by lights and others too numerous to mention. The relief, however, was only temporary, and the condition at present is worse than ever. What we want is immediate relief, and that can be obtained only by keeping the highways clear for moving vehicles. The parking of automobiles in congested areas should be stopped at once.

On a recent survey of the district from 59th to 14th Street from Lexington Avenue to Seventh Avenue 6,135 vehicles were found parked. This condition interfered with the passage of tens of thousands of other vehicles and hundreds of thousands of passengers. Our own checks show cars parked on Broadway and in 34th Street from two to six hours.

A north and south thoroughfare is needed in midtown; why not extend Park Avenue from 96th Street to the Madison Avenue Bridge? This can be accomplished by roofing over the New York Central tracks as far as 112th Street, thus providing easy and quick access to the east Bronx, thereby relieving Fifth and Madison Avenues of some of the overload.

A number of others discussed the general subject. It was the general opinion that the local situation is so serious that definite steps should be taken to rectify it.

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Maintenance Notes

Wheel Hoist for Raised Pit

AN INGENIOUS form of wheel hoist is used in the shops of the Mobile Light & Railroad Company at Mobile, Ala. It is not new, having been installed some 20 years ago, but this fact alone makes it interesting, because it has given satisfaction for two decades. While it takes some room, it is easy to operate, and as the car is about 3 ft. above the floor when the truck is removed there is plenty of room for the workmen to move about in and there is plenty of light to let them see what they are doing.

The Mobile shops are equipped with both sunken and "raised" pits, and it is one of the latter which is equipped with the hoist. As shown in the illustrations, the hoist consists of a vertical piston operated by air and carrying at its upper end two short sections of track on a framework which is swiveled around the piston. When the car is run over the pit this section of track is in line with the pit rails and the piston is in its raised position. The rails are kept in alignment in this position by fishplates and bolts.

When the wheels come over the rails on the hoist the car is jacked up. The bolts and fishplates are then removed and the piston is lowered. When the wheels come to the level of the shop floor the framework supporting the wheels is swung around a quarter circle and the wheels are rolled out.

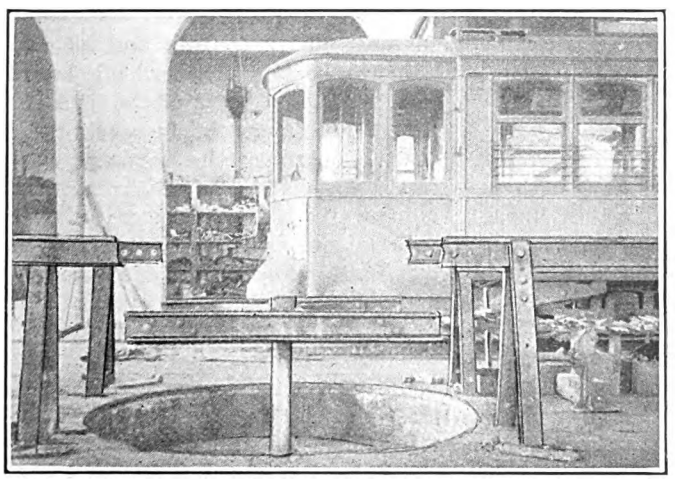
Car Sign Painting Methods Used in the Shop of the Department of Street Railways, Detroit, Mich., Greatly Reduce the Cost and the Time Consumed

Fast Work in Car Sign Painting

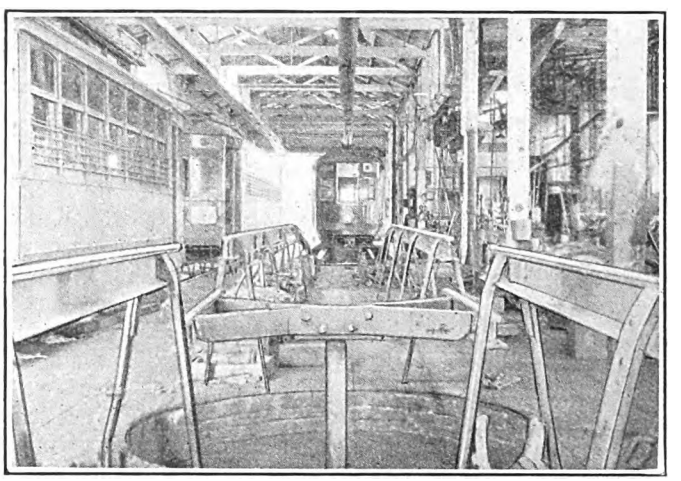
PAINTING car signs is but a moment's job as carried out in the car shop of Detroit's Department of Street Railways. The cloth used in the sign painting is first treated to a bath of fish oil and then hung up to dry, as shown in the view of the section used for sign painting. This treated cloth is then wound on rolls and hung on either end of the double sign painting table shown to the right in the illustration.

Letters forming the sign are cut from cardboard and pasted on the frames prepared in advance. These frames are of metal and wood construction and have silk bolting cloth stretched tightly in place. The letters forming the signs are then glued to the bolting cloth. The frames are hinged so that they may be attached to the table as shown. To the right of the table one of these frames is standing vertical just before being lowered over the cloth. One sweep of a rubber-edged wiper filled with a thick black sign paint forces the paint through the mesh of the cloth except in the space forming the letters. The frame is raised and the sign is painted. A few dabs of the brush complete the margins and an occasional spot that may be missed. The operator cuts the sign section in the manner shown on the left half of the table and hangs up the section to dry on the wire racks in the background.

After use the bolting cloth frames



Side View of Pneumatic Pit Hoist at Mobile



End View of Pneumatic Pit Hoist

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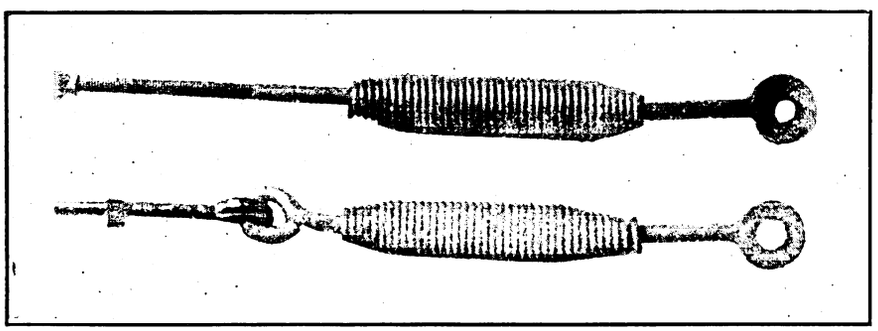
are thoroughly cleaned with gasoline in the tray table, shown slightly to the left of the cutting table. The workman is in the process of cleaning the frame just removed from the left end of the sign painting table. The frame is then stored away for future use in vertical racks, the edge of one just showing in the lower right-hand corner.

Most of the finished signs seen in the background are sections made to replace parts of rolls that were worn. When dry these are stitched in the roll sections of cars brought in for repairs.

The type of sign used in Detroit shows up well as it consists of white letters against a black background. At night the lamps placed back of the signs illuminate the letters silhouetted by the opaque background. Other colors can be used at will simply by using a different color paint. There is no comparison to the time formerly consumed by hand painting or by the use of double stencils that had to be carefully matched, one name at a time.

Double Rod Reduces Brake Release Failures

CONSIDERABLE trouble with broken rods for brake release springs was at one time experienced on the Richmond cars of the Virginia Electric & Power Company. The breaks did not occur in the springs themselves, but in the threaded shank. While not a serious matter, it was bothersome and so worth remedying.



Release Spring Connection on Brake Rod as Modified in Richmond

The most plausible theory advanced to account for the trouble was that the pull on the rod came sometimes from one angle and sometimes from another slightly different and that breakages could be avoided if the connection was not quite so rigid. This suggested the use of a rod in two parts joined together by two eyes. After this type of construction was installed the trouble disappeared, showing that the theory followed was correct.

In the accompanying illustration the upper view shows the spring rod as it was formerly used; the lower view shows the spring rod as changed in the shops under the direction of W. J. Hicks, master mechanic.

Emergency Valve Used with Straight Air Brake

USE has been made by an Eastern electric railway of the balancing feature of the triple valve to give added safety to cars equipped with straight air brakes. This company operates one-man cars in hilly districts and occasional difficulty has been experienced in stopping cars when the ordinary brake apparatus has been put out of order as the result of accident. Relief of air pressure on one side of the balancing valve is effected by a hand valve. The movement of the balancing valve then produces a direct connection between the air reservoir and the brake cylinder. This, of course, is sufficient to stop the car and hold it for some time, affording all the passengers an opportunity to alight if desired.

The release valve has been placed inside the front bulkhead, and an emergency pull cord runs the entire length of the car. The balancing valve has been installed under the longitudinal seat. Holes were cut in the back of a near-by heater to eliminate the possibility of moisture in the valve, causing it to freeze up. Above the holes in the heater a horizontal piece of transite has been placed to reflect the heat down against the valve and away from the rattan cushion. While the need for using this apparatus is infrequent the cost of installation is comparatively slight and the added safety provided by it is believed to be advantageous.

New Equipment Available

Oil-Tight Multi-Pole Circuit Breaker

SO AS to meet the demand for greater reliability and increased interrupting capacity, created by the modern tendency toward expanding concentrations of power and the demand for maintenance of uninterrupted service, the Westinghouse Electric & Manufacturing Company has developed a new type of oil-tight multiple-pole oil circuit breaker.

One of the novel features of this breaker is the inclosing of the three poles in a single round tank. This arrangement results in a type of breaker from which material advantages are gained in the form of increased interrupting ability; rugged, oil-tight construction, increased electrical clearances for terminal connections and a minimum of space requirements. The single circular tank with a rounded bottom and the dome-shaped frame form a breaker chamber cylindrical in shape with domed ends resembling boiler construction. This shape represents a maximum of strength for resistance to internal pressures with the most efficient use of material and the maximum volume of inclosed breaker chamber for a given installation space. The domed frame permits using space, heretofore inefficiently utilized, about the contact studs for additional volume of air expansion chamber above the oil, and also allows the system of operating levers to be inclosed within the breaker chamber, all without increasing the over-all height of the breaker.

A main shaft brought through the frame with a single operating lever outside, and well away from the live terminal connections, and the remainder of the levers within the breaker results in the removal of grounded moving parts from the vicinity of the bus connections. By this means the air insulating distances outside the breaker are increased and an oil-tight structure

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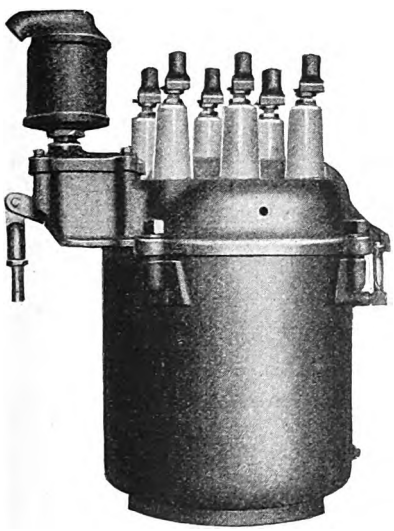
obtained, neat and trim in appearance and easily kept clean. The single round tank for all poles provides for the most efficient use of the oil, the insulating properties of the entire volume of oil being available for each pole, and simplifies such maintenance features as renewal of oil, maintaining the oil level and the inspection of contacts.

The breaker is particularly well adapted to meet the requirements of heavier switching service in powerhouse and substation applications due



Type B-20 Multi-Pole Oil Circuit Breaker with Single Tank

to the increased interrupting capacity obtained by this form of construction. Adequate mechanical strength for resisting internal stresses; the large volume and head of oil; the ample air expansion chamber; large air insulating clearances outside the breaker chamber and the minimum of installation space required, together with its sturdy contact construction and a closing mechanism with sufficient power to close the contacts positively and accelerate them rapidly in opening, make the breaker dependable under severe operating conditions.

Light Electric Soldering Irons

LIGHT in construction and designed to heat up quickly, a new soldering iron is made by the General Electric Company in standard sizes ranging from ½ in. to 1¼ in. tip. The power ranges from 70 watts for the smaller iron for light and intermittent use to 350 watts for the larger size on heavy duty. The irons for heavy duty are provided with radiating stands for the purpose of maintaining the iron at the correct operating temperature when temporarily not in use. The rapid rate of initial heating is brought about by unusually good heat conduction between the heating element and the copper tip. Heat from the tip is prevented from reaching the handle by means of a special mechanical construction between the two, this being in the form of a spiral made from a steel rod. This also provides a rigid connection between the handle and tip.

Instead of mica, usually used for an electrical insulator in the heating unit of soldering irons of this type, the heating unit has an insulating powder so highly compressed that it becomes a good heat conductor and will withstand temperatures of more than 2,000 deg. F.

The iron is provided with a standard lead and connection plug. Its construction is simple, parts are few and all parts are easily replaceable.

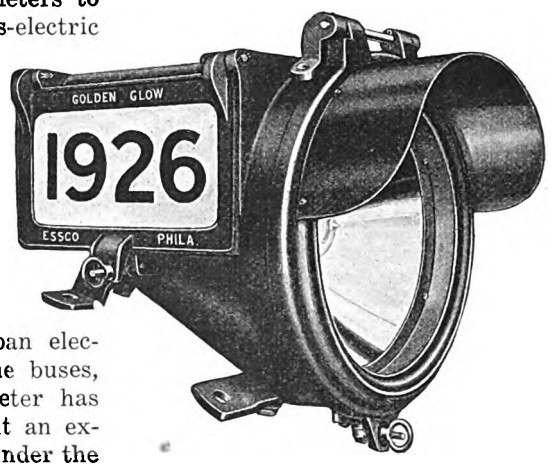
Meter Measures Bus Performance

FOR recording the performance of gas-electric buses, the Economy Electric Devices Company, Chicago, has recently placed on the market an Economy watt-hour meter with kilowatt-hour inspection dials. The Philadelphia Rural Transit Company has ordered 375 of these meters to be installed upon its gas-electric equipment. The order is the result of exhaustive tests which have been made by the Philadelphia company on watt-hour meters designed for this purpose. The meter itself resembles the standard railway type of Economy watt-hour meter used in street railway and interurban electric car work. Used on the buses, however, this particular meter has characteristics which give it an excellent accuracy curve even under the greatly varying voltage and current conditions typical of the gas-electric drive. It is connected to measure the output of the gas-engine-driven generator and will therefore afford definite means for comparing the relative efficiencies of the bus drivers and also for determining operating efficiencies of the individual gas-electric power plants.

In addition, the kilowatt-hour inspection dial feature of these meters will serve the shop maintenance department in determining the proper time for inspection and lubrication of equipment. The meter has three dials, each equipped with a moving and a stationary hand. The stationary hand is set at a point representing the amount of power which may be produced or consumed before inspection is necessary. When the moving indicator coincides with the stationary one, indication is given that inspection is due. After inspection is made, the moving hand is reset at zero and another cycle of operation is started. This feature eliminates all bookkeeping formerly necessary by the shop forces to keep account of mileage and to pull the bus into the shop at the end of 2,000 or 4,000 miles. The shop foreman or clerk, by a glance at the meter each night, may determine which particular bus is due for inspection and overhaul on the following day.

Tapered Body Feature of New Headlight

DESIGNED to fit the roofs of electric cars, a new headlight has just been placed on the market by the Electric Service Supplies Company, Philadelphia, Pa. This is an addition to the Golden Glow line and is specially designed for electric cars, self-propelled rail cars and the like, where installation on the roof is desirable. The body of the new



Headlight Arranged to Fit Curvature of Electric Car Roof

headlight is tapered and the seats are made so that they will conform to the curvature of electric car roofs. The main body of the new headlight is made in one integral cast aluminum shell. Front and side doors are also of aluminum and are gasketed to make them weatherproof. All fittings are of bronze. This new headlight has been designated type RA-128.

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The News of the Industry

Trustees Favor Boston Control Bill

Interesting testimony about the Boston Elevated Railway, Boston, Mass., representing official points of view, was given recently before the Massachusetts legislative committees on metropolitan affairs and street railways, sitting jointly. H. Ware Barnum, general counsel for the Board of Public Trustees, said that he spoke for the majority of the board. He accepted, in general, the provisions of the bill. The extension of the public control for thirty years he approved. Such an extension he regarded as necessary to economic financing, as it gives an element of certainty to the investment. Uncertainty of termination of public control, and private management, is more injurious to the financing, he said, than a certainty of private ownership would be. At least $6,000,000 is needed in the next five years to keep the present service going.

Some people contend that the upkeep should come from earnings, so that if there is a proper depreciation account there is no need of new capital to maintain the service. The fact is that all the items going into the property cost twice as much today as when obtained, and under the law this excess in cost for replacement purposes must come out of new capital, and not out of earnings. That is a proper provision, as otherwise the road would be building up out of earnings.

When the report speaks of $6,000,000 it bases this on a minimum requirement, and Mr. Barnum estimated that the road really needs $2,500,000 a year of new capital. If it is allowed to sell preferred stock that improves its finances more than the actual amount of the new stock issue, because it follows that new bonds may be issued to the same amount as the stock, and with the new capital the company would be in a position to keep pace with the growth of population and the proper demands for expansion of the transportation facilities.

The proposed 30 years extension, Mr. Barnum thought, would give the necessary certainty and security to get low rates on the new money. The ten-year period which comes to an end in two years was not long enough for any comprehensive financial plan. In reality it has been only a six-year period, because the first four years were consumed in testing and determining the constitutionality of the law, and such proceedings do not encourage any long-term financing at favorable rates. It takes a much longer period to have any appreciable effect upon money rates.

Frederic E. Snow, counsel for the Elevated, said he did not believe that extension of public control 30 years, with a dividend rate of 5 per cent, would restore stock to par, and that consequently he "did not feel that the purpose of the Legislature would be accomplished by the proposed bill."

Although he said he was not authorized to speak for the common stock holders, Mr. Snow said he thought they are going to feel that they ought not to be asked to make the sacrifice involved in a cut in the dividend rate. "There is grave doubt about them accepting any proposition of this kind," said he.

Mr. Snow said that although the directors have passed no vote on the question of taking the road back, they are "ready to do it if the state decides to pass the road back." Asked by Senator Rice whether upon return of the road to private ownership the directors could finance it, give as good service at the same rate of fares as the public trustees, Mr. Snow said that it would take some time for the road to obtain new capital, and that the public would have to be content with the same service as at present.

Fact-Finding Study of New York Transit Problems

Causes of Congestion Outlined in a Report by the Regional Plan Committee—Traffic of Surface Cars, Buses, Elevated and Subway Lines and Steam Roads Is Analyzed

GROWTH of the port of New York and the industrial business and residential communities which now form one metropolitan region has led to congestion in places of business and recreation, delays in movement and in the transaction of business and increased costs of handling freight and passengers. This problem has been studied by the Committee on the Regional Plan of New York and its Environs and a report prepared by H. M. Lewis, executive engineer. The purpose of the study was to obtain the knowledge of facts needed to formulate a plan. Review of certain proposals made by public bodies does not carry with it any indorsement of specific projects and no definite suggestions are put forward on behalf of the committee. Progress has been made in the development of a plan, but the time is not yet opportune for publication.

Additional Facilities Needed on Vast Scale

Additional facilities of all types should be provided on a vast scale, the report states. While it is recognized that these cannot all be provided at once, the plans for them can be prepared, steps for carrying them out can be tentatively determined upon and available funds can then be applied to the progressive execution of a broad scale plan, which will provide for and direct the future growth of the region.

Experience in New York City has proved that population will follow transportation lines promptly and intensively. Their construction may lead either to increased congestion or to dispersion of business and industry in accordance with the amount of far-sightedness applied to the plan. The transit situation has grown so much more rapidly than the municipal authorities could estimate that the confusion is discouraging. In New York City more than 1,000 franchises exist giving transportation companies the right to operate upon public property. The periods vary for which these franchises were granted, but a large percentage of them are for long terms and many of them are perpetual. More than 200 operating companies hold these franchises.

2,000,000 Enter New York a Day

Of a total of more than 2,000,000 persons who enter Manhattan on a typical business day, 52.8 per cent come from Long Island, 29.8 per cent from the north, 15.6 per cent from New Jersey and 1.8 per cent from Staten Island. Almost two-thirds of the total number are carried by rapid transit facilities and less than 10 per cent by surface cars, while the trunk line railroads carry only 6.1 per cent into the city. In 1925 the mileage of rapid transit main running track in New York City was more than 590. Of this amount, about 100 miles was built in the period from 1904 to 1909 and more than 260 miles was added between 1914 and 1921. Since 1921 there has been no substantial increase in the mileage and the increase in traffic has heavily overloaded the existing facilities.

Concentration of buildings in the district below Fulton Street, Manhattan, an area of a little more than one-third of a square mile, is one important cause of congestion. The uptown business area is more scattered, but also presents a serious transit problem. More than 40 theaters, seating nearly 60,000, located within 1,000 ft. of the intersection of Broadway and 42d Street cause a concentration of passenger traffic which has placed a dangerous burden upon the rapid transit stations.

As congestion increases some form of decentralization will be forced, and this probably can best be guided by furnishing a system of belt line and

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bypass routes which would encourage a more desirable distribution. It would be possible to add to the volume of traffic entering Manhattan south of 59th Street without constructing new transit lines by using to capacity all of the tracks and other facilities which are now only partially used. In the case of the lines from the north crossing 59th Street, increased capacity could be obtained only by lengthening the local platforms to accommodate longer trains or by constructing new lines. It would be desirable to supply as soon as possible such subway connections and facilities in Manhattan, Brooklyn and Queens as will make possible the full utilization of East River crossings. After the completion of various changes now under consideration, the total possible ultimate increase of capacity across the East River on the lines of the Interborough Rapid Transit Company would be only about 18 per cent, and on the Brooklyn-Manhattan Transit Corporation lines about 100 per cent. The capacity of Interborough north and south lines on Manhattan could be increased approximately 13 per cent.

In 1924 the total transit fares per inhabitant in New York City were about 450, having increased from 220 in 1890 and 320 in 1910. Surface car riding increased steadily during the years from 1860 to 1900, but there has been comparatively little increase since the latter date. The present riding habit on surface lines is about 180. Fares collected along subway routes outside of the central business district correspond to an annual riding habit based on the adjacent population of about 260 fares per inhabitant. Similar sections of elevated railway systems average 100 to 200 rides per inhabitant a year, varying with the type of development along the route.

Peak Noted During Spring Season

Rush-hour traffic in the morning on the rapid transit lines is from 380 to 584 per cent of the average hourly traffic, while the theater rush hour in the evening is from 112 to 156 per cent of the average hour. A study of seasonal variation of transit traffic indicates a peak during the spring months and a minimum in August. The elevated and surface lines both draw passengers from the subway lines during the summer months. Elevated lines show the least seasonal variation of these three groups of facilities.

Traffic on the surface lines has been practically stationary since 1914. It is believed, however, that this type of transit will continue to have its definite field.

Development of bus routes within the area has been mostly within the last ten years, and the growth of their business in many places has been rapid. During 1922 a complicated system of bus routes was proposed for New York City by the Department of Plant and Structures. More recently the Board of Transportation of New York City has developed proposals for bus routes.

An interesting point brought out in the report is that a large part of the traffic carried during rush hours by the Fifth Avenue Coach Company is long-haul traffic, averaging 5.1 miles. The average length of haul on Manhattan surface car lines is only 2.05 miles. Average speed of the buses is 7.9 m.p.h. and of the cars 7.3 m.p.h. More than five times as many buses were operated in the rush hours on Fifth Avenue as surface cars on Broadway or Madison Avenue. The buses, however, carried only 3½ to 4½ times as many passengers as did the cars.

Estimates of future traffic are also included in the report. By 1965 it is estimated that about 4,500,000 persons may enter Manhattan on a typical business day by all lines of transportation.

Passenger traffic and freight traffic problems of the existing steam railroad systems are considered in the report. Other sections deal with the use of waterways and with aviation. Airway transportation must be considered in planning for the future, but there is little chance of any serious competition in the near future with existing ground systems of transportation.

The danger of a network of rapid transit lines in the outlying parts of New York City and the metropolitan sections of New Jersey, such as will encourage intensive development in those areas, should be avoided. A homogeneous business district is advantageous, but residential areas should possess variety and provide for both open and close development.

$77,000,000 Valuation Fixed at Baltimore

Finding Handed Down in United Railways Case, Long Pending Before Public Service Commission—President Disappointed with Final Figure—No Fare Increase to Be Sought

PROPERTIES of the United Railways & Electric Company, Baltimore, Md., were valued at $77,000,000 as of Jan. 1, 1924, in an opinion handed down on March 9 by the Public Service Commission. The opinion brought to an end a case pending since Dec. 30, 1912.

An order was passed continuing the present rate schedules for two years, commencing at last midnight and ending at midnight April 30, 1928. This order, however, may be changed by the commission any time within the two-year period.

The commission expressed the opinion that "it would be unwise" to require the United "to embark on such an experiment" as the weekly pass.

The majority opinion of the commission made an allowance of $7,000,000 for easements (lands over which tracks are laid but not owned outright by the company) in the valuation figure. The United placed a value of approximately $18,000,000 on this item.

J. Frank Harper, member of the commission, wrote a dissenting opinion, in which he refused to concur with Harold E. West, chairman, and Ezra B. Whitman, the third member, in making any allowance for easements.

C. D. Emmons, president of the company, expressed disappointment at the low figure of the valuation. He pointed out that under the valuation the company was entitled to a higher rate of fare, but stated that the company expects to stand by its promise not to ask for any increase at present. The company has ten days in which to file with the commission a statement of agreement with the opinion or dissension from it. Mr. Emmons said.

> Our own valuation, after depreciation and all kinds of allowances, was $88,000,000, exclusive of easements, which I thought represented the actual cash value of the property, but people's counsel contended for $60,000,000, so it was quite evident at the trial that he didn't really expect so low a valuation.
>
> The commission allowed $70,000,000 for net value, exclusive of easements. In so doing they gave the people's counsel and the car rider the benefit of very doubt and discounted every possible uncertainty in the proof. I think this was lower than we were entitled to.
>
> Our total income with proper allowances ation of $70,000,000. According to all the rules of courts and commissions we would be entitled, even on present valuation, to a higher rate of fare, but we have said we hoped to avoid applying for an increase unless taxes or similar charges further make it necessary. By this statement we expect to stand.
>
> The opinion shows such painstaking care that it is difficult to get into a complaining mood.
>
> It is a satisfaction also that the three commissioners are unanimous as to the main point—a minimum value of $70,000,000, and that they differ only as to the $7,000,000 for easements. And it is a satisfaction also to find that the commission unanimously found our investment value, counting all doubtful questions against us, was over $71,000,000.
>
> Our total underlying divisional bonds, funding and other notes, amounted as of the valuation date, to between $49,000,000 and $50,000,000. The valuation is $77,000,000 and excluding easements the unanimous valuation is $70,000,000, so that these securities have an equity even under the worst conditions of 40 per cent, and including easements, of 55 per cent.
>
> Our securities are evidently selling below their proved asset value and I hope this prolonged investigation will finally set at rest the question of the value of our property and the reasonableness of our fare, and assure the security holders of the soundness of their investment.
>
> Whether we shall appeal I cannot at present decide. I am satisfied that a review of all the questions involved will result in a higher rather than a lower valuation, especially as to amounts allowed for easements. We will decide this after we have had a better opportunity to go over the opinion.

ELEMENTS TAKEN INTO CONSIDERATION IN EVALUATING UNITED'S PROPERTIES

The various elements taken into consideration by the Public Service Commission in determining the fair value of property owned by the United Railways are as follows:

Cost to Reproduce New, Undepreciated:	
Company (including easements)	$113,264,205
Company (excluding easements)	95,079,251
People's counsel (excluding easements)	72,975,688
Commission's finding (excluding easements)	78,541,895
Cost to Reproduce New, Less Depreciation:	
Company (including easements)	106,641,360
Company (excluding easements)	88,456,406
People's counsel (excluding easements)	60,488,392
Commission's finding (excluding easements)	70,100,645
Securities:	
Par value	85,827,200
Market value	56,629,818
Original Cost:	
Company	68,158,908
People's counsel	57,000,000
Original Cost in Present-Day Dollars:	
Company	100,087,000
Company (less superseded property)	86,810,000
People's counsel	83,730,000
People's counsel (less superseded property)	71,410,000

The commission allowed a total valuation of $77,000,000, including a $7,000,000 allowance for easements.

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Special Limited Service Begun on Detroit Interurban

"Royal Blue" limited cars were put into operation on March 8 between Detroit and Royal Oak and Detroit and Pontiac, on the Pontiac Division of the Detroit United Railway. The limited cars run on schedule providing a car every hour on the hour from 7 a.m. to 5 p.m., leaving both Detroit and Pontiac terminals. Additional local interurban service varying from fifteen-minute to half-hour intervals between terminals, with a ten-minute rush-hour service in the morning between Birmingham and the Ford plant in Highland Park, has been announced by A. L. Drum, executive manager for the Security Trust Company, and W. C. Dunbar, receivers for the Detroit United system. All of the new equipment is not available to complete the improved service, but in the two or three weeks intervening the new schedules are to be in effect.

The limited cars which have already started in operation have bodies of royal blue and are decorated on the outside with pictures of the Indian chief Pontiac, "the Chief of the Ottawas." The new cars for local service are sand color. The all-steel de luxe chair car with observation platform has another color scheme, including the green band around the center of the body.

These changes are in accord with the improvements and economies planned for the Detroit United lines by the receivers. Other changes and improvements are planned for the coach lines now operated in connection with the D.U.R. system.

It has been announced that double-deck buses for rush-hour service will be put on the route between Royal Oak and the Ford factory, and in addition there will be another series of double-deck sightseeing buses for summer service on the Woodward super-highway between Detroit and Pontiac.

The receivers have been authorized by Judge Charles C. Simons to pay the city of Detroit $48,500 for rental of tracks and power for two years. The order is made contingent on the fact that the payment does not deplete the operating funds of the railway.

No Formal Wage Demand Yet in New York State

Employees of the New York State Railways in Rochester, Syracuse and Utica are beginning conferences preparatory to making demands for a revised wage and working agreement for the year that begins May 1. No formal program has been adopted, but a demand for an increase in wages, at least 5 cents an hour for all classes, was said to be assured.

Adoption of a definite program hinges on whether the Rochester union shall submit its demands separately from the workers in Syracuse and Utica.

Last September the Rochester men voted to ballot on contract proposals separately. This action followed the Rochester union being voted down by the preponderance of the Syracuse and Utica vote in the last poll on wage agreements.

In Rochester an 8-cent fare went into effect on Jan. 1. While the railway has asked for a similar fare increase (of 1 cent) in the two other New York State cities, the proposal is pending before the State Public Service Commission, with little likelihood of its beng adjusted before the time for voting on a yearly wage contract.

Rochester employees are likely to ask for power to bargain separately in the belief that the fare increase granted in their city will give them added ground for their request for higher pay.

Merchants Interviewed on Proposed Subway

Chicago merchants may pay a substantial part of the cost of the new subway which the city expects to build under the loop district in 1927 or 1928. Marshall Field & Company, owner of two of the seven blocks on State Street, have agreed to contribute.

The city, through a special committee headed by Alderman Albert, is interviewing the merchants who will derive the most benefit from a subway. The Field promise is believed to have set a precedent that makes the committee's work simple.

Owing to legal obstacles in the way of a collection of benefits for subway building, no official "negotiations" have been launched, but material is being collected to determine whether the response of the merchants will make it worth while to get special laws passed at the next Legislature to cover their contributions.

Albany Fare Hearing Deferred

No definite date has been set for a hearing on the application of the United Traction Company, Albany, N. Y., for an increase in fare from 7 cents to 10 cents cash or thirteen tokens for $1. The matter was held in abeyance by the Public Service Commission due to the death of Mayor Hackett of Albany. It is expected the commission will fix the date for some time in April.

John Boyd Thatcher, second, who has succeeded Mr. Hackett as Mayor, has announced that he will carry out the policies and program of his predecessor so far as possible. It is understood that the Corporation Counsel of the city of Albany is preparing to oppose the application for an increase in fare in so far as legal means may prevail.

Linked with the increase sought in the capital district is the application of the New York State Railways for increases in Utica and Syracuse.

Bridge Between Kentucky and Indiana Needed.—Prospects appear rather bright at this time for eventually securing an interstate bridge at Louisville, connecting Louisville with southern Indiana, for passenger, vehicular and street car use, to operate for approximately 25 years as a toll bridge, after which it would become a free bridge. At the present time there are three railroad bridges, two of which are used by interurban cars and one has roadways for automobile traffic. Bills have been introduced in Congress by Kentucky Representatives and Senators and enabling acts are now in the Kentucky Legislature. The proposed bridge would cost about $4,000,000.

Springfield Supports Rehabilitation Plan

Support has been extended by the City Council of Springfield, Mass., to the rehabilitation plans of the New Haven road in connection with the Springfield Street Railway system. Springfield will join with Worcester in asking for legislation to proceed with the proposed plans. The order of the City Council follows:

> Ordered, if the Common Council concur, that the Mayor be and is hereby authorized, in the name and on behalf of the city, to petition the General Court of Massachusetts that it take favorable action on the petition that the New York, New Haven & Hartford Railroad be authorized to acquire and hold the securities and properties of the New England Investment & Security Company; provided, however, before using such favorable action, the Mayor shall request the General Court to amend said bill by adding at the end thereof an additional section providing that so much of the bill as relates to the Springfield Street Railway, the Springfield Railways and the New England Investment & Security Company, controlling the operation of street cars in Springfield, shall take effect upon its acceptance by vote of the City Council of the city of Springfield.

The directors of the New Haven have met and officially approved the report for the rehabilitation of the Springfield system. The plans involve an expenditure of $1,500,000, which includes new rolling stock, additions to lines and new trackage. The proposed changes at Worcester in the Worcester Consolidated Street Railway were also approved. They involve an expenditure of $1,000,000. The proposed amendment to the petition by the City Council of Springfield was also approved as a reasonable request.

Vice-president E. G. Buckland of the New Haven does not approve of the wording of the order as constructed by the City Council, as it does not allow the New Haven to take over the New England Investment & Securities Company without the approval of the Council. This, however, will be rectified at the preliminary hearing in Boston.

The bill to the Legislature is divided into three parts. It grants the New Haven railroad the authority to take over the holdings of the New England Investment & Securities Company, makes its control over the Springfield Street Railway effective subject to the approval of the City Council of Springfield and makes its control of the Worcester Consolidated Street Railway subject to the approval of the City Council of Worcester.

In commenting on this line of action Mr. Buckland said:

> This will allow us to negotiate with the owners of stock when the enabling act is passed by the Legislature. We will not, however, be allowed to take over management and control of the trolley systems until the local City Councils have given their approval.
>
> I do not want any misunderstanding about the railroad's attitude. It has been said the railroad is insistent upon certain terms. In fact, we have been guided by the recommendations of the joint survey committee and approve its expert advice as to what improvements would modernize the Springfield system. The traffic expert of Springfield was a member of the committee and I understand that Mayor Parker is pleased with the contents of the report. Therefore our attitude is formed on the basis of the judgment of these experts.

The hearings on the matter before the Legislature at Boston are to start at once, and it is expected they will be completed by March 17.

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110-Mile Electrification in Prospect

Electrification of the Springfield, Havana & Peoria Railroad, Springfield, Ill., is now under consideration, according to J. F. Gilchrist, a vice-president of the Commonwealth Edison Company, the new owner of this stretch of the old Chicago, Peoria & St. Louis Railway. Mr. Gilchrist is also president of the Chicago & Illinois Midland Railway, a 30-mile coal road which has acquired by lease the Springfield, Havana & Peoria. The new owners plan to expend a considerable sum in rebuilding the Springfield, Havana & Peoria, which extends from Springfield to Pekin, having 110 miles of trackage.

Milwaukee Authorized to Build Freight Line

Ruling that the Wisconsin Railroad Commission need not heed zoning or civic planning activities in granting certificates for rail lines, the Wisconsin Supreme Court denied the petition of the Milwaukee County Board and the County Park Commission for a rehearing on the order under which the Milwaukee Electric Railway & Light Company was granted authority to build and operate a freight line from its Lakeside power plant west through Tippecanoe and the town of Lake to connect with the main system of the Chicago, Milwaukee & St. Paul Railway.

This new decision finally ends the long controversy which the county waged against the building of this line. Objection was made to the line running through a proposed residential section when it could have been built further south in a district that is to be industrial in character. When the commission issued a certificate of convenience and necessity for the building of the line on Sept. 22, 1924, county and town authorities appealed to the Dane County Court. The court set aside the commission's order, but the commission reissued the certificate on May 30, 1925, without another hearing. Appeal was then taken to the Supreme Court, which upheld the findings of the commission. Motion was then made for a rehearing, which was denied, ending the fight.

New Parking Plan in Philadelphia Highly Beneficial

J. H. M. Andrews, assistant vice-president of the Philadelphia Rapid Transit Company, speaking before the Philadelphia alumni of the Massachusetts Institute of Technology at the Engineers' Club on March 3, made the following statements:

A recent check made by the Philadelphia Rapid Transit Company shows a very direct benefit to the car riders, who compose 90 per cent of the users of the downtown streets, brought about by the new parking regulation on Chestnut and Walnut Streets.

The result to the car rider under the new ordinance has been a 14 per cent increase in speed, which to the man boarding a car at Front and Walnut Streets means about four minutes saving in his ride to 20th and Walnut Streets.

A check has been made of the length of time required for a street car to operate eastbound from 20th and Chestnut Streets to Front Street, to Walnut Street and westbound to Nineteenth and Walnut Streets. The result showed that the average journey at the hour selected for the check was made in 33½ minutes. Checks made at the same hour and under similar conditions on Jan. 6 and on Jan. 20 showed that the same journey required from 38 to 40 minutes prior to adoption of the present "no parking" plan.

The total saving in time and money to the users of Chestnut and Walnut Streets, to the merchants and to the community generally is incalculable. Traffic congestion in American cities costs $1,500,000,000 a year, according to a special committee appointed by Secretary of Commerce Hoover.

Permissive Recapture Legislation for New York City Introduced

Mayor Walker of New York has sent to Albany and had introduced to the Legislature under bipartisan auspices a bill which would give power to the Board of Estimate to negotiate for the recapture of obsolete surface lines in the city. The bill is permissive in character. If, after a public hearing, it should be determined by the Board of Estimate that a line has outlived its usefulness, the board can decide that its tracks should be removed, and with the approval of the Mayor may enter into an agreement with the railroad or operators on terms of surrendering the property. With an agreement reached, the franchise would be voided and the tracks ripped up, the city paying with proceeds from serial bonds or short-time securities.

Accident Competition Renewed in Chicago

A one-year accident prevention contest was started in February among the many divisions of the Chicago Surface Lines, under the direction of Victor E. Noonan, supervisor of accident prevention. It is an amplification of an experimental contest conducted last year with great success, according to Surface Lines employees.

Meetings that are being conducted are well attended. Scores will be posted monthly, with divisions rated on ten classifications of accidents and figured in proportion to the car-miles of each division. The ten classifications are:

1. Fatal accidents to trainmen or other employees.
2. Fatal accidents to passenger and public.
3. Boarding or alighting accidents.
4. Collisions with vehicles.
5. Persons struck by cars.
6. Collisions of cars.
7. Brushed off steps (cars in motion).
8. Thrown in car by start or stop.
9. Employees injured on duty.
10. Blind cases.

A percentage of ten will be perfect in each classification. Prizes will be awarded to winning divisions.

Transportation Study at New Bedford

The New Bedford, Mass., City Planning Board has prepared a study, reproduced in the New Bedford *Sunday Standard* on March 7, on the position of the highways of today, how far they will be able to meet the needs of the people, and just what the big unsolved problem for the municipalities is today. The board's survey outlines aims sought and results of various methods tried. It discusses parking space versus travel lanes, loading space within buildings, store garages versus branch stores, staggered closings and other important problems in the traffic tangle. It is the opinion of the board that the greatest advance in the solution of the problem will be attained when each user of the streets considers the safety and convenience of others as well as his own.

Loss in Atlanta Freight Receipts

Permission to abandon freight and express service on all of its interurban lines has just been asked of the Georgia Public Service Commission by the Georgia Railway & Power Company, Atlanta. The two interurban lines affected are the Atlanta Northern, running between Atlanta and Marietta, Ga., and the Stone Mountain interurban, operating between Atlanta and Stone Mountain. The petition referred to the increasing use of automobile trucks as well as to the passenger automobile as the cause for the slump. Figures in the petition show a decrease in net freight and express revenue from $14,938 in 1919 to $4,543 in 1925. The net loss in 1919, the petition further states, was $8,647, increasing to $10,857 in 1925.

Business Men Will Help Preserve Indiana Line

To insure the continued operation of the Evansville Suburban & Newburgh Railway, Evansville, Ind., something must be done in the way of increased patronage. The company recently installed one-man cars on its lines with the hope of reducing expenses. The Business Men's Association of Boonville, Ind., has taken steps to lend assistance to the line. A committee will be appointed to call on the business men and ask them to patronize the railway. It was pointed out by this association that the bus lines and trucking associations operating between Evansville and Boonville have cut deeply into the business of the traction company. The company operates a line from Evansville to Newburgh, a distance of 10 miles, and from Evansville to Boonville, a distance of 18 miles. An improved state highway starting at Evansville runs through Boonville and on to French Lick.

Advertising Emblem Sought at Cincinnati

After trying unsuccessfully for three months to obtain an appropriate trademark from private artists, the Cincinnati Street Railway, Cincinnati, Ohio, has announced that it would give $50 for an acceptable drawing of such an emblem to be used for general advertising purposes. The contest is open to all school children and to the general public. If the winning emblem should be submitted by more than one person the prize will be divided proportionately. "We want a trademark that will stand the test of time and that will properly represent the safe, dependable all-day, all-night, all-the-year-round transportation service of the Cincinnati Street Railway," said Hudson Biery, director of public relations. He said that the design must be simple, that the trademark may include words or letters, may be symbolic or be purely a design.

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Philadelphia May Run Subway

Mayor Kendrick of Philadelphia, Pa., in a recent statement threatened municipal operation of the Broad Street subway in the event of failure to reach an agreement with the Philadelphia Rapid Transit Company for its operation. The Mayor's statement protests against the ultimatum of the company in claiming back dividends for the company's stockholders under the 1907 city-transit contract and expresses the hope that negotiations for operation of the $100,000,000 investment may be entered into with a spirit of fair play.

News Notes

Wage Demands Made at Des Moines—Demands have been made by the employees of the Des Moines City Railway, Des Moines, Iowa, for a 5-cent wage increase with time and a half for all Sunday and holiday work. The present maximum is 60 cents an hour.

Prefer Street Car in Marinette.—Preference for the retention of street car service instead of replacement by bus service was the unanimous choice of the Marinette, Wis., City Council when it turned down the petition of the Menominee & Marinette Light & Traction Company asking permission to institute trial bus service on its unprofitable Pierce-Hall Avenue line.

Interurban Rates Increased.—Another change in interurban fares has been announced by the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind. The increase recently approved by the Indiana Public Service Commission brings the fares from 2 to 2½ cents a mile. The increase followed similar action on bus fares in that section. The company officials said they were unable to pay operating costs on the present income. The company has been going through a period of experimentation with reduced fares as a result of bus competition. Commutation rates by which travellers can buy $5 of transportation for $3.75 still hold good.

Fare Increase in Evansville.—A 1-cent fare increase in Evansville, Ind., has been ordered by the Indiana Public Service Commission following the request of the Southern Indiana Gas & Electric Company, owner and operator of the Evansville street car lines. Under the new rule, patrons will pay 7 cents for a single fare, and will receive only sixteen checks for $1, instead of a 6-cent fare or twenty checks for $1, as in the past. Increase in automobile traffic and consequent falling off in passenger traffic on its lines was given by the company as the chief reason for seeking an increased fare.

Mrs. Charles Henry Dies at Indianapolis.—Mrs. Charles Henry, 72 years old, wife of Charles L. Henry, president and receiver of the Indianapolis & Cincinnati Traction Company, pioneer traction man of Indiana, died recently at her home in Indianapolis, following an extended illness. She married Mr. Henry 51 years ago. Mrs. Henry is survived by her husband, four daughters and one son.

Recent Bus Developments

Application for Gas-Electric Operation in Buffalo Renewed

Ernest M. Howe, Detroit, has renewed his application before the City Council of Buffalo, N. Y., for a permit to operate 5-cent gas-electric buses over 71.5 miles of streets on thirteen routes in the city. Recently the Public Service Commission rejected Mr. Howe's application for a permit to operate in Buffalo when he failed to reveal plans for financing the project. It is now reported the company represented by Mr. Howe has been financed by New York interests.

Of the $1,600,000 necessary to start operations on the 5-cent bus lines in Buffalo, Mr. Melville informed the municipal authorities that $1,200,000 has been raised and Mr. Howe has sailed for England to secure the remaining $400,000 capital. The Tilling-Stevens gas-electric buses will be used by the Buffalo Omnibus Corporation, of which Charles P. Norcross, vice-president of O. J. Gude & Company, outdoor advertisers, is president.

Opposition to the Howe bus proposals was entered by the International Railway, Buffalo, and its subsidiary the International Bus Corporation.

Mayor Frank X. Schwab charged at the Council hearing on the bus proposals that the International Railway is a "confessed bankrupt" and is seeking to saddle its "$40,000,000 debt on a bus company, so that if the traction company becomes bankrupt in fact it could still operate as a bus company."

Bus Hearing in New York on April 8

The Board of Estimate of New York on March 11 postponed until April 8 the statutory hearings on 29 applications for bus franchises, presented by 24 companies. Mayor Walker informed the applicants that the board felt that the statutory hearings should not be held until they had completed an analysis of the offers. According to the Mayor the board will reach no conclusion until all the petitioners have been examined and their offers weighed in executive session.

John A. Ritchie, chairman of the board of directors of the Fifth Avenue Coach Company, declared that the company would be ready on a week's notice to supply full service on all eleven routes which it has proposed to operate in the Bronx.

Mayor Walker held his usual weekly transit conference with members of the Transit Commission and the Board of Transportation.

Service in Cincinnati on April 1

Service will be started on April 1 on two crosstown lines by the Cincinnati Street Railway, Cincinnati, Ohio, with the first bus consignment representing 23 buses. In the meantime this equipment will be held in storage at the plant of the Cincinnati Car Company in Winton Place. The two routes first to be operated intersect nineteen electric railway lines. The buses are of Mack make with Bender bodies, are orange colored with cream top, have aluminum bodies, a seating capacity of 29 passengers and are upholstered in leather. A feature is a vacuum booster brake, which is an added safety factor. The street railway has received a large number of applicants for the position of bus operators. Preference will be given to present employees where they are found to be fitted for the work.

City Lines in Indiana Under Commission Rule

Operation of bus lines wholly within the limits of a municipality under the terms of a municipal ordinance licensing the local bus lines does not exempt the lines from the jurisdiction of the Indiana Public Service Commission in its administration of the new motor bus law. This is the opinion rendered by Arthur L. Gilliom, Attorney-General, to the Indiana Public Service Commission. The question was whether such operation came within the classification of a contract which is exempted from the commission control by the bus law. The controversy arose at Connersville.

Joint Operation Over Camden Bridge Suggested

Joint operation of a bus line over the Delaware River bridge between Philadelphia, Pa., and Camden, N. J., by the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey was proposed on March 6 by the Philadelphia company. A new company, the stock of which would be owned equally by the two concerns, would be formed if the proposal is accepted by the bridge commission.

Trial Service Abandoned.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has abandoned the operation of bus service on Grand Avenue from Thirty-sixth Street to Hawley Road in Milwaukee, started on Dec. 28 as a trial line. Lack of patronage led to the suspension.

Seeks Increase in Bus Rates.—The Indianapolis & Cincinnati Traction Company filed with the Public Service Commission on March 4 a petition asking authority to increase its rates of fare for its bus line operating between Indianapolis and Shelbyville, Ind. The present rate is 2 cents a mile for straight fares and 1.49 cents a mile for commutation tickets. The company asks that a straight 3-cent fare be established, that tickets be interchangeable between the bus line and traction line, and that permission be granted for the baggage of bus passengers to be carried on the traction cars. Recently the company purchased the last of its bus competitors when it took over the Red Ball lines between Indianapolis and Shelbyville.

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Keeping Pace with Needs.—The Wisconsin Gas & Electric Company, Kenosha, Wis., will improve its city bus service by the installation of three additional buses costing $9,000 each. A $70,000 garage and storeroom are under construction for the accommodation of the buses.

Buses Between Collinsville and East St. Louis.—The Illinois Commerce Commission on Feb. 24 granted the East St. Louis & Suburban Railway a certificate of convenience and necessity for the operation of buses in intrastate business between Collinsville, Ill., and East St. Louis, Ill. This line, operated by the Red Line Company, a subsidiary of the East St. Louis & Suburban, had been operating intrastate business between Collinsville and Greenville and continues into St. Louis.

Seeks Permission to Buy Bus Certificates.—Authority to buy bus certificates held by the Anderson Bus Corporation, Anderson, Ind., is asked in a petition filed with the Indiana Public Service Commission by Arthur W. Brady, receiver for the Union Traction Company. The bus corporation holds six certificates authorizing the operation of bus routes wholly within the city of Anderson.

New Bus Route Opened.—The new Lemay Ferry Road bus route of the St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., went into service on March 3. It extends from Broadway and Koeln Street, St. Louis, to Point Breeze, on the Lemay Ferry Road in St. Louis County. A fare of 7 cents for adults and 3 cents for children is charged, but no transfers to the lines of the United Railways are furnished. The buses connect with the Broadway and Bellefontaine divisions of the railway.

Opposes Intrastate Business.—The Eastern Massachusetts Street Railway in a petition to the United States District Court has sought an injunction to restrain the Abbott Motor Coach Company from carrying on an intrastate business between Brockton, Mass., and Providence, R. I. The injunction was granted March 8 by Judge Brewster. The bus line will be allowed, however, to continue its interstate business between these two points.

New Schedules Planned.—Buses will replace trolley cars, beginning March 15, on the Hartford & Springfield Street Railway, East Side line, between Warehouse Point and the Connecticut state line, and also on the Somers division, where a limited schedule has been maintained for trolley cars for several months. An exception will be made on Saturdays, however, when the present schedule will be maintained, and on other weekdays school and workmen's extras will be run. The existing car service will be maintained from Warehouse Point south to connect with the Connecticut company's system. In place of the trolleys on the northern end, buses will be run every half hour between Thompsonville, Conn., and Springfield, Mass., and hourly bus service will be given on the Somers division and also south of Warehouse Point, where buses are used to supplement the trolleys.

Financial and Corporate

Net in Duluth Much Higher

Earnings of 100-Mile System in Pacific Northwest Cities Show Marked Progress in 1925

The net income transferred to profit and loss of the Duluth-Superior Traction Company, Duluth, Minn., for 1925, showed an increase of $41,857 compared with the year previous. The increase in operating expenses and taxes indicated in the accompanying table is due to vacation allowances to employees, an increase in personal property taxes in the city of Duluth and the cost of bus operation. The sum of $59,286 was expended for renewals and charged against the depreciation reserve. For additions to property during the year $216,237 was spent.

In his annual report to the stockholders, A. M. Robertson, president, referred to the steps taken to develop the bus transportation business. He tells the history of the Duluth Coach Company, which later changed its name to the Duluth-Superior Coach Company. The outstanding stock of this company, $61,600, is all owned by the Duluth-Superior Traction Company.

In July the Duluth Street Railway, a subsidiary of the Duluth-Superior Traction Company, purchased the local jitney bus business in Superior, thus eliminating all remaining bus competition in both Duluth and Superior. No extensions of railway lines were made during the year in Duluth or Superior.

The Duluth Street Railway amended its articles of incorporation to provide for an issue of 7 per cent preferred stock and offered $500,000, par value, for sale in limited quantities through its own employees. The offering was made on March 16, 1925, and at the end of 22 days the amount was fully subscribed. The stock was sold to employees at 96 and to the local public at 98. At the close of business on Dec. 31, 1925, these 5,000 shares were distributed among 1,653 holders in Duluth, Superior and immediate vicinity, 337 employees of the company being the owners of from one to seventeen shares of this preferred stock.

The report goes into detail on the fare controversy waged by the Duluth Street Railway, the subsequent court hearing and a decision of the Supreme Court of Minnesota sustaining the lower court, which "will remove the last legal obstacle delaying a hearing by the commission on the company's application for an increased fare."

Some statistics on the railway operation only are included in the accompanying tables.

CONSOLIDATED INCOME STATEMENT OF THE DULUTH-SUPERIOR TRACTION COMPANY

	1925	1924
Operating revenues:		
Revenue from transportation	$1,928,624	$1,774,763
Revenue from other operations	14,868	14,638
Total operating revenues	$1,943,493	$1,789,402
Operating expenses:		
Way and structures	$209,908	$206,146
Equipment	225,193	194,919
Power	178,704	175,939
Conducting transportation	729,398	689,660
Traffic	2,521	967
General and miscellaneous	243,109	228,404
Transportation for investment—Credit	—10,823	—9,980
Total operating expenses	$1,578,012	$1,486,058
Net revenue from operations	$365,480	$303,343
Taxes assignable to operations	$139,294	$113,313
Operating income	$226,186	$190,029
Non-operating income:		
Income from funded securities	$15,169	$8,713
Income from unfunded securities and accounts	2,456	2,050
Income from sinking fund and other reserves	13,980	14,199
Miscellaneous income	465	397
Total non-operating income	$32,070	$25,359
Gross income	$258,256	$215,389
Deductions from gross income:		
Interest on funded debt	$171,054	$172,651
Interest on unfunded debt	2,736	127
Miscellaneous debits	604	606
Total deductions from gross income	$174,395	$173,385
Net income transferred to profit and loss	$83,861	$42,004

STATISTICAL STATEMENT OF THE DULUTH-SUPERIOR TRACTION COMPANY

(Street Railway Only)

	1925	1924
Total revenue	$1,905,001	$1,814,759
Total operating expense, including depreciation	$1,494,898	$1,457,342
Net revenue	$410,102	$357,417
Revenue passengers carried	30,638,092	29,204,274
Transfers redeemed	5,309,085	5,104,670
Operating, per cent of revenue, taxes included	85.58	86.55

COMPARATIVE STATEMENT OF RAILWAY OPERATING REVENUES*

1916	$1,407,511
1917	1,621,952
1918	1,665,909
1919	1,937,142
1920	1,919,579
1921	1,777,330
1922	1,784,774
1923	1,904,606
1924	1,789,402
1925	1,873,013

*Above comparative statement has been made to conform with the Interstate Commerce Commission's classification of accounts. Non-operating income not included.

TRACK MILEAGE AND PASSENGER EARNINGS PER MILE OF THE DULUTH-SUPERIOR TRACTION COMPANY

(Street railway only)

Total miles, single track	16.40
Total miles, double track	43.56
Total miles, special track	6.21
Total miles, all track reduced to single	109.73
Average total miles, all track reduced to single, operated during 1925	109.71
Total miles of street and right-of-way occupied by tracks, 1925	59.97
Average total miles of street and right-of-way occupied by tracks, operated during 1925	59.97
Revenue from transportation, per mile single track	$16,936
Revenue from transportation, per mile street occupied by tracks	$30,984
Revenue from transportation	$1,858,144

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$539,914 Carried to Surplus by Midland Utilities

Rapid development of the Midland Utilities Company, Chicago, an investment company which owns or controls public utility companies in northern Indiana and western Ohio, is shown by the first annual report prepared to cover the calendar year 1925. The Midland Utilities began business on June 22, 1923, but its securities were not offered to the public until March, 1925.

The annual report shows the total income of the company in 1925 was $2,985,781.60, compared with $2,118,716 in 1924. Net income for the last year was $2,287,912, compared with $1,517,104 in 1924. After the payment of dividends on the prior lien and preferred stocks and $219,048 paid on the common stock, $539,914 was carried to the surplus account, which on Dec. 31 aggregated $1,115,607.

The Midland subsidiaries at the close of 1925 were furnishing electric, gas or transportation service to 194 communities, as compared with 118 communities served on Dec. 31, 1924. The estimated population served increased from 600,000 in 1924 to 850,000 at the close of 1925.

The principal operating subsidiaries in the Midland group are the Northern Indiana Gas & Electric Company, Northern Indiana Public Service Company, formerly called the Calumet Gas & Electric Company; Indiana Service Corporation, Gary Railways, Chicago, South Shore & South Bend Railroad and West Ohio Gas Company.

Philadelphia-New Jersey Merger Not Yet Accomplished

No definite plan of merger has been accomplished by the Trenton, Bristol & Philadelphia Street Railway, the Pennsylvania-New Jersey Railway and the Frankford, Tacony & Holmesburg Street Railway. It was said in the spring of last year that plans were under way for a consolidation of three electric railways through which there would be a direct route from Bridge Street and Frankford Avenue, Philadelphia, to Trenton, N. J. The Trenton, Bristol & Philadelphia Street Railway and the Pennsylvania-New Jersey Railway are controlled by the same interests, which also have a minority interest in the Frankford, Tacony & Holmesburg Street Railway.

Status of Connecticut Line Explained

Action pending to foreclose the two mortgages on what was originally the Groton & Stonington Street Railway, now underlying mortgages on the property of the Groton & Stonington Traction Company, Groton, Conn., is intended to clear the title to these properties and create one unified property all owned by the traction company. So far as the Groton & Stonington Street Railway is concerned it is non-existent. It was liquidated in 1916. The trackage became the Groton and Stonington Division of the Shore Line Electric Railway. On Jan. 1, 1923, the receiver of the Shore Line Electric Railway sold this division, subject to the underlying mortgages, to a new company incorporated as the Groton & Stonington Traction Company in order to expedite liquidation of the receivership estate. All the securities of the traction company are now owned by the Shore Line receivership estate, so that the Groton & Stonington Traction Company is a going concern with no suggestion of receivership, either present or future. It is in excellent financial condition. The traction company is the owner in fee of the trackage from Groton into New London and owns the equity in the main line.

Cincinnati & Dayton Traction Sold—Reorganization Arranged

Eighty-six-Mile Road Soon to Come Out of Receivership—Debt to Be Cut from $4,900,000 to $1,300,000—$4,000,000 Equity Represented by 20,500 Shares Holding Company Stock

PROPERTIES of the Cincinnati & Dayton Traction Company, offered for sale on March 9 by George P. Sohngen, receiver, in the suit of the Citizens Savings & Trust Company, Cleveland, Ohio, against the company, brought a total of $519,400 for constituent properties. The College Hill division was sold for $89,000; the Dayton division, extending from Hamilton to Dayton, $208,500; Hamilton City lines, $201,000; power house at Lindenwald, $19,000. and miscellaneous, $1,900.

The purchasers were Thomas E. Conway, Philadelphia, and Warren S. Havens and Livingston Jones, Cleveland, forming the bondholders' reorganization committee. This committee represents 95 per cent of the bondholders of the Cincinnati & Dayton and the underlying companies holding securities valued at approximately $2,000,000.

The sale is subject to approval of the Court of Appeals, which ordered it and fixed the knockdown price for the various divisions of the company's lines.

The plan and agreement for the reorganization of the Cincinnati & Dayton Traction Company have been adopted by the protective committee representing the holders of the first and consolidated mortgage bonds of the Southern Ohio Traction Company and by the committee representing holders of the Cincinnati & Hamilton bonds. As both of these committees were faced with the fact that the security holders they represent will become the owners of the railway, their problem was to try to set up a financial structure which will adequately care for the future as well as for present capital requirements. Accordingly provision has been made for the incorporation of an operating company to take title to the entire property subject to a small divisional first lien upon 11 miles of interurban between Dayton and Miamisburg, under which $250,000 par value of bonds are now outstanding.

The successor company will execute a new $200,000 closed first mortgage upon the Hamilton city lines to replace the Hamilton & Lindenwald mortgage to be foreclosed. The operating company will also create a modern open-end mortgage as a lien upon the entire property, subject only to the two divisional liens previously mentioned. To provide new capital $850,000 of first and refunding series A 6 per cent gold bonds will be issued. The balance of the equity in the property—substantially upward of $4,000,000—will be represented by common stock, all of which, with the exception of the directors' qualifying shares, will be owned by the holding company.

The holding company will issue the following securities:

$2,125,000 par value of 6 per cent prior lien debenture gold bonds, dated Jan. 2, 1926, due Jan. 1, 1976.

$875,000 par value, 6 per cent, adjustment income gold bonds, dated Jan. 2, 1926, due Jan. 1, 1976.

20,500 shares of common stock, no par value.

Incidentally arrangements have been made for the extension of the $250,000 of Dayton traction bonds for a period of five years. On the other hand, it was impossible to effect an extension of the Hamilton & Lindenwald bonds in the hands of the present holders. In consequence, it has been necessary to provide for refinancing this issue in connection with the reorganization. The reorganization managers have arranged for the distribution of a substantial part of the proposed issue of new Hamilton & Lindenwald bonds in lieu of cash, in payment of fees and expenses fixed under order of the court or otherwise. The plan contemplates that the balance will be subscribed for and issued to holders of the Cincinnati & Hamilton and of Southern Ohio bonds.

It is explained that the prolonged efforts of the Cincinnati & Hamilton and Southern Ohio protective committees to formulate a plan of reorganization under which the Cincinnati, Dayton & Toledo committee would agree to accept securities for the property and equities owned by it, free and clear of the liens of the Cincinnati & Hamilton and the Southern Ohio mortgages, proved fruitless. As a result, the Southern Ohio committee, with the approval of the Cincinnati & Hamilton committee, has taken an option on the so-called Cincinnati & Northwestern division, consisting of the section of the interurban line from the Cincinnati terminal to College Hill and of the freight line from College Hill to Mount Healthy. With this exception, no provision is made in the reorganization plan for the stockholders of the Cincinnati & Dayton Traction Company.

In order to meet the immediate financial needs Southern Ohio bondholders, as well as the holders of Cincinnati & Hamilton bonds, are asked to subscribe to part of an issue of $200,000 par value of new Hamilton & Lindenwald bonds and to part of an issue of $850,000 par value of bonds to be issued under the new first and refunding mortgage

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There will be no assessment for expenses upon depositing bondholders who assent to the plan, as it is felt that the funds which will come into the hands of the committee from operation and from other sources will be sufficient to enable the committee to function.

As for the new money which depositing bondholders are asked to provide, the entire contribution represents new capital, the proceeds of which will be expended in the reorganization and rehabilitation of the property. It will be represented by an equivalent par value of new securities, upon which the committee believes a regular return will be enjoyed by the holders. In this connection, it is interesting to contrast the initial bonded indebtedness of $1,300,000 of the operating company with the fact that from 1906 to 1917 the same property was subject to mortgages aggregating $4,900,000.

The property included under the plan of reorganization consists of:

(a) An interurban line, 53½ miles in length, a large part of which is of double-track construction, located almost entirely upon private right-of-way, running from the center of the city of Dayton to the outskirts of the city of Cincinnati.

(b) A branch line from College Hill to Mount Healthy, 3 miles in length, over which only freight service is now rendered.

(c) Local street railway lines serving the city of Hamilton.

(d) Two local railway lines furnishing service to a rapidly growing section of Dayton, Ohio.

The total population of the territory served, including the cities of Dayton and Cincinnati, was 733,030 in 1920. The total track mileage of the property is 86.2 miles.

At the time of the appointment of the receiver in 1920 the property was badly run down. More than $300,000 in net earnings from operation have been returned to the property in rehabilitation, improvements and betterments.

There is no bus competition between Hamilton and Dayton, but the railway is still subject to competition between Hamilton and Cincinnati. There also is competition with the local railway lines in Hamilton.

The city lines in Hamilton have been upon a paying basis for some time. Present net revenues are upward of $71,000 a year. This good showing is attributed to efficient operation and the modernization of the property, including the thorough rehabilitation of the tracks and the introduction of modern light-weight one-man cars. It has been impossible during the receivership similarly to modernize the interurban lines and the Dayton City lines. The new financing in connection with the reorganization is intended to provide funds for these purposes.

The net earnings during the twelve months ended Oct. 31, 1924, and 1925 respectively, are as follows:

	Year Ended Oct. 31, 1924	Year Ended Oct. 31, 1925
Gross earnings from operation	$968,606	$972,255
Operating expenses, including maintenance, rentals and taxes	861,940	852,638
Balance	$106,665	$119,616

The interest charges on $250,000 on Dayton Traction sixes, $200,000 new Hamilton & Lindenwald bonds and $850,000 first and refunding series A 6 per cent bonds aggregate $78,000 per annum. The net earnings available for the payment of fixed charges in the twelve months ended Oct. 31, 1925, were $119,616, or more than 1½ times the interest charges upon these securities.

Announcement is made that, conditioned upon the prompt acceptance of the reorganization plan and the provision of the new capital, an arrangement has been effected with Thomas Conway, Jr., and his associates to become the executive officers of the new companies. Based on the assumption that the reorganization will become effective early this year, that the Cincinnati subway will be opened in 1928 and that the necessary additional investment will be made from time to time for the purpose of handling the anticipated growth in the company's business, Mr. Conway has furnished the accompanying estimate of the probable results of operation of the railway in the five years 1926 to 1930.

The annual interest charges on the prior lien debenture gold bonds contemplated in the plan are $127,500. Estimates indicate that this interest will be earned by the operating company beginning in 1928.

The annual interest charges on the adjustment income gold bonds aggregate $52,500. Estimates indicate that the interest on these bonds will be earned by the operating company beginning in 1929, after providing for interest upon the prior lien debenture gold bonds.

Upon surrender of his certificate of deposit issued under the bondholders' protective agreement of May 15, 1918, each depositor will be entitled, for each $1,000 bond deposited, to receive interim certificates calling for $500 face value adjustment income gold bonds of the holding company and two shares of common stock without par value of the holding company. Each depositor will also be entitled, for each $1,000 bond deposited, to purchase for $250 the following securities:

$50 face value of new Hamilton & Lindenwald bonds.

$200 face value of first and refunding mortgage series A 6 per cent gold bonds of the operating company.

$500 face value of prior lien debenture gold bonds of the holding company.

Four shares of common stock without par value of the holding company.

The committee recommends that each of the depositing bondholders purchase his proportion of the new securities and thus protect his present investment.

ESTIMATE OF PROBABLE EARNINGS OF THE CINCINNATI & DAYTON TRACTION UNDER REORGANIZATION

	1926	1927	1928	1929	1930
Gross revenues from operation	$1,030,000	$1,162,500	$1,426,000	$1,532,000	$1,642,000
Operating expenses including maintenance, rentals and taxes (exclusive of federal income tax	903,606	905,490	1,108,110	1,157,510	1,212,185
Balance	$126,394	$257,010	$317,890	$374,490	$429,815
Interest on bonds of "operating company" chargeable to operation	50,000	78,000	108,000	126,000	144,000
Balance	$76,394	$179,010	$209,890	$248,490	$285,815
Depreciation accrual	40,000	55,000	57,500	60,000	62,500
Balance available for dividends to "holding company," federal income tax, and surplus	$36,394	$124,010	$152,390	$188,490	$223,315

$2,000,000 British Columbia Issue

Sales Campaign to Be Conducted by Canadian Company to Place Stock with Local Public

A customer-ownership campaign to sell $2,000,000 of stock in Vancouver and Victoria will be opened on March 20 by the British Columbia Electric Railway. Of the total, $500,000 will be sold through employees of the company and the ramainder through bond dealers in the two cities.

The issue will consist of 6 per cent cumulative preference shares in the British Columbia Electric Power & Gas Company, a subsidiary of the British Columbia Electric Railway, incorporated in the province of British Columbia for the purpose of permitting customer ownership to be realized. It will take over the capital stock of several power and a few gas companies, amounting in value to more than $15,000,000, which has been held in the past by the railway.

The British Columbia Electric Railway is an English company and as such its capital is in pounds sterling and its dividends are subject to English income tax. It has never been feasible to sell the stock or shares of this company to local people in British Columbia for these reasons.

The railway will continue to operate the properties of the power and gas company and will guarantee the dividends. These shares will be sold at the price of 99. The guarantee of the railway places the new shares ahead of all other stock issues, amounting to $21,000,000. There are unencumbered assets behind the new issue totaling $20,000,000, or $1,000 for every $100 share. While only $2,000,000 of these shares will be issued at present, a total issue of $5,000,000 is authorized.

Of the present issue $1,000,000 has been underwritten by a syndicate which has an option on a further $500,000. The employees of the company have been allotted $500,000 to sell and to subscribe. The employees' campaign has been placed in the hands of a committee consisting of W. Saville, general secretary; E. H. Adams, comptroller, and J. Lightbody, publicity manager. The two sales will be carried on simultaneously.

The subscription limit has been placed at $5,000. The company will accept no applications from persons resident outside the province of British Columbia.

The proceeds of the issue will be used on construction work during 1926. The year's program calls for a total expenditure of nearly $5,000,000. Any

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further financing that is necessary will be done, as in the past, in England.

The directors and officers of the new company will be identical with those of the railway.

Dividend on Common Stock Increased by Twin City

The Twin City Rapid Transit Company, Minneapolis, Minn., has declared a quarterly dividend of $1.25 on the common and the regular quarterly dividend of $1.75 on the preferred, both payable April 1 to stock of record March 15. The previous common dividend was 4 per cent yearly. It was paid semi-annually.

January Revenue in Boston Lower

In January, 1926, the revenue of the Boston Elevated Railway, Boston, Mass., exceeded the cost of service by $223,302, against $269,649 for January, 1925. Details of January operation are given in the following table:

General Financial Data:	1926	1925
Revenue exceeded cost of service	$223,301.90	$269,649.08
Operating revenue per car-hour (A.E.R.A. std.)	$6.15	$6.25
Operating revenue per car-mile operated, cents	64.09	65.27
Average fare per revenue passenger, cents	9.231	9.186
Ratio operating expense to operating revenue, per cent	67.17	65.83
Passengers Carried:		
Revenue passengers	33,144,528	33,305,311
Per cent 5-cent and 6-cent passengers, per cent	18.63	19.49
Revenue passengers per car-mile operated	6.804	6.973
Operating Facts:		
Trips operated	635,193	606,938
Car-miles operated:		
Rapid-transit lines	1,258,980	1,290,266
Surface, two-man	2,100,618	2,261,585
Surface, one-man	1,193,843	1,090,984
Express, newspaper and sprinkler cars	6,513	6,875
Motor bus	311,407	126,571
Total miles operated	4,871,361	4,776,281
Accident Data:		
Accidents per 10,000 car-miles	2.28	2.30
Accidents per 10,000 bus-miles	5.96	5.06
Revenue passengers carried per accident	27,078	29,340
Average number of witnesses per accident	3.28	3.26
Complaints and Defects:		
Complaints in regard to car service	26	28
Employees complained of by car riders	118	136
Car defects reported per 10,000 car-miles	5.5	8.9

Permission Sought to Acquire Tennessee Line.—The Tennessee Eastern Electric Company, Johnson City, Tenn., recently applied to the State Railroad and Public Utilities Commission for permission to acquire the Johnson City Traction Corporation, operating 6 miles of line. The electric company already owns a majority of the traction stock.

San Juan Company Enjoined from Discontinuing.—The Public Service Commission of San Juan, Porto Rico, on Feb. 27, 1926, enjoined the Porto Rico Railway Light & Power Company, of which the Porto Rico Railways, Ltd., is a subsidiary, from discontinuing its trolley service in San Juan. The Porto Rico Railways, Ltd., on Feb. 24, 1926, announced that the trolley company would surrender its franchise and discontinue service on Feb. 28, 1926.

Railway Sold.—The St. Francois County Railroad, Bonne Terre, Mo., has been taken over by a group of Farmington, Mo., business men. They will continue the passenger and freight service between Farmington and DeLassus. This is the third time that local citizens have owned this electric road. The St. Francois line operates 12.9 miles of line.

Surplus of $221.—The Greenfield-Montague Transportation Company, operating an independent railway line between Greenfield and Montague, Mass., reports a net profit of $1,796 in 1925. Each town received a dividend and $1,450 was paid into the treasury for emergencies, leaving a surplus of $221. The total passenger revenue for the year was $72,024. The line operates under special permissive legislation from the State of Massachusetts.

St. Louis Certificates Called for Payment.—Pursuant to the order of the United States District Court Receiver Rolla Wells of the United Railways, St. Louis, Mo., has called for payment at 100.5 and accrued interest on April 1 all of the present outstanding issue of series B receiver's certificates. Funds for payment of the certificates and interest will be deposited with the First National Bank of St. Louis and the Guaranty Trust Company of New York. The certificates outstanding total $4,200,000.

Railway Rights May Go to Bus Company.—Negotiations have been opened for the purchase of the Hudson River & Eastern Traction Company, which owns the railway lines in Ossining, N. Y., by the owners of a bus company. If the project is successful it will lead to the abandonment of the railway. Officers of the railway are said to have admitted that the village authorities had indicated a preference for bus lines to street cars and that the negotiations had been opened. It is reported that the Westchester Coach Company, in which E. W. Niver of Briarcliff is interested, is seeking control of the railway.

Abandonment Petition Denied.—The Missouri Public Service Commission recently denied the application of the Southwest Missouri Railroad to abandon service between Joplin and Duenweg, a distance of about 6 miles. Duenweg has lost heavily in population since work in the mines adjacent to it fell off. Service over the railway to Duenweg has been reduced to one car a day, but the company desires to supplement the service by operating buses.

Seeks Abandonment of Unprofitable Lines.—A representative of the Northern States Power Company recently appeared before the City Council of Chippewa Falls, Wis., to determine whether public objection would be voiced against the proposal of the company to discontinue city service in Chippewa Falls and interurban service between Eau Claire and Chippewa Falls. The operation of these systems, it is declared, has proved a losing proposition due to the popularity of the bus and private automobile as well as objections from the city in connection with the use of city streets by the company. There was no personal objection voiced by members of the City Council to the proposal. It is expected that the next step will be a formal application to the commission.

Key System Issue Offered.—A syndicate headed by E. H. Rollins & Sons, New York, is offering at 97½ and interest to yield 5.78 per cent $2,500,000 of first mortgage 5½ per cent gold bonds, series C, of the Key System Transit Company, Oakland, Cal. The bonds are dated Oct. 1, 1925, and are due July 1, 1938. The proceeds will be used to reimburse the company's treasury for capital expenditures heretofore made and will provide funds for additional improvements.

New Financing in Portland Planned.—Stockholders of the Portland Electric Power Company, Portland, Ore., on March 24 will consider the issuing of common stock of no par value for common stock of $100 par value and plans for financing through the sale of common stock instead of bonds or prior preferred stock. This announcement was made recently by Franklin T. Griffith, president. A statement pointed out that the company will need $6,450,000 to meet its obligations, provide sinking funds and revenues for the construction program.

Capital Stock Increased.—At a special meeting of the board of directors of the Madison Railways, Madison, Wis., an increase of $300,000 in its capital stock was authorized, raising it to $1,000,000. By the sale of this additional stock the company hopes to secure sufficient money to carry on its 1926 program of improvements and extensions. The first improvement to be made this year will be the paving and double tracking of Breese Terrace and the improvement of six other streets used by the company.

Conditions in St. Johns.—The present actual cost of operating the line in St. Johns, Newfoundland, by the Newfoundland Light & Power Company is 10 cents a passenger exclusive of overhead cost, while the passenger receipts average 4.6 cents, as six tickets are sold for 25 cents. The deficit on the railway has to be met from the profits of the lighting system. J. W. Morris, superintendent of the line, is reported to have said that there had been an appreciable increase in traffic since the road was rehabilitated and new cars installed.

Grand Junction Utilities Bought.—Henry L. Doherty & Company, New York City, have purchased all the public utilities of Grand Junction, Col. Gas, light, transportation and ice plants are included. The owners of the Grand River Valley Railway and the Grand Junction Electric & Gas companies' properties, which are involved in the deal, are the estate of the late Charles M. MacNeill, Charles L. Tutt, A. E. and L. G. Carlton, Joseph Stewart and Spencer Penrose. The consideration is said to be $150,000. The properties will be formally transferred on May 1. The railway, comprising 27 miles, operates between Grand Junction and Fruita.

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Legal Notes

ALABAMA—*Time to Sound Gong.*

In an action for injuries resulting from a collision between an automobile and a street car, the company's counsel requested an instruction that the duty of the motorman did not require him to sound his gong until he realized, or by the exercise of reasonable care should have realized, that the automobile driver was not aware of his approach. The court held, however, that this might have deprived the alarm of its utility, and the proper time at which the gong should have been sounded, in the circumstances, should be determined by the jury. [Mobile L. & R. Co. vs. Logan, 106 Southern Rep., 147.]

MAINE—*Public Welfare as Well as Public Convenience and Necessity Required for Certificates.*

The Maine laws require automobile common carriers to secure permission from the Public Utilities Commission before beginning operation, and the commission has jurisdiction over the routes, schedules, rates of fare, etc., of such motor vehicles. A bus company to which a certificate was refused by the commission applied for a writ of mandamus to compel the issue of a certificate on the ground that it is a ministerial act and no discretion was permitted to the commission in the issuing of such certificate. The court held that the Legislature has vested in the commission a broad discretion, having in view not only the necessity and convenience of the public but also its general welfare, and its authority, if it desires, to prohibit the use of public ways to heavy high-powered motor buses cannot be doubted. In this case, no abuse of discretion appeared on the part of the commission. [Maine Motor Coaches, Inc., vs. Public Utilities Commission, 130 Atlantic Rep., 866.]

MASSACHUSETTS—*State Trustees of Electric Railway Must Secure Local Licenses to Operate Motor Buses.*

Under the authority of the Legislature, trustees were appointed to operate the Eastern Massachusetts Street Railway system and were empowered with authority over rates and other matters. This authority was held not to include that of operating motor buses without first securing licenses for such bus operation from the local authorities concerned. [Eastern Mass. St. Ry. vs. Trustees of Eastern Mass. St. Ry., 149 Northeast Rep., 628.]

MICHIGAN — *Contributory Negligence and Assumption of Risk as Defenses Under Employers' Liability Act.*

In the case of a section hand who was injured and brought suit under the federal employers' liability act, the court held that while contributory negligence was not a defense under the act it might be considered by the jury in diminishing the plaintiff's damages. Assumption of the risk by the employee, however, is a distinct defense that would bar recovery. [Safranski vs. Detroit G.H. & M. Ry., 250 Northwest Rep. 485.]

NEW JERSEY—*Duty of Automobile Guest.*

A man riding as a guest on a motor truck was injured in a collision between the truck and a trolley car. He admitted that he had observed the car as it was approaching but had said nothing to warn the driver. His negligence, in such circumstances, was held to be a question of fact to be determined by the jury and not a matter of law to be disposed of by the trial court. [Baus vs. Trenton & Mercer County T. Co., 131 Atlantic Rep., 92.]

NEW YORK—*Liability for Collision with Unlawful Bus.*

A bus, which was being operated without lawful authority to use the public streets, was injured by a trolley car. The railway company claimed the presence of the bus on the streets to be a trespass and a public nuisance, so that it was not liable. The court held that the trespass was not the proximate cause of the accident, so that the railway was not relieved of its duty to exercise reasonable care to avoid a collision. [Audubon Transportation Co. vs. Yonkers Railway, 212 N. Y. Sup., 684.]

OHIO—*Conditions for Issue of Interstate and Intrastate Certificates of Convenience and Necessity.*

An applicant for a certificate of convenience and necessity for a motor bus line in Ohio to a point outside the state was asked if he desired a certificate to operate an exclusively interstate motor service and said he did not. He could not then complain at not receiving either an interstate or intrastate certificate, where the Public Utility Commission decided that the public convenience and necessity did not require intrastate service. [Eager vs. Public Utilities Commission of Ohio, 149 Northeast Rep., 865.]

PENNSYLVANIA—*Supervision over Infant Passengers.*

A boy 8½ years old, riding on an electric car with his sister 14 years old, left his seat and stood on the steps of the rear platform. He was seen in this position by the conductor who warned him of his dangerous position, but immediately afterward he fell or was thrown from the step and injured. A judgment in the trial court for the plaintiff was reversed. [Trippett vs. Monongahela W. P. P. S. Co., 130 Southeast Rep., 483.]

Book Reviews

Guiding Principles of Public Service Regulation

By Henry C. Spurr, editor of Public Utility Reports. Public Utility Reports, Inc., Munsey Building, Washington, D. C., 750 pages. $7.50.

This is Vol. II of the new work on utility regulation. It is based upon findings by public bodies. There are full references, and complete index. The table of cases covers 56 pages. For convenience the table of contents has been divided into 25 chapters, carrying over from Vol. I and including the subjects: Pavement over Mains, Land and Buildings, Property Not Used or Useful, Abandoned and Superseded Property, Standby Equipment, Property Acquired for Future Needs, Property Not Owned by Utility Company, Donated Property and Services, Property Paid for Out of Earnings, Miscellaneous Charges to or Deductions from Capital, Working Capital: Function and Amount Necessary, Basis for Estimating Working Capital, Nature and Kind of Depreciation, Necessity of Providing for Depreciation, the Depreciation Fund or Reserve, Prevailing Treatment of Accrued Depreciation, Proper Treatment of Accrued Depreciation, the Annual Depreciation Charge, Rates of Depreciation, the Return and Its Ascertainment, Treatment of Expenditures for Betterments, Replacements and Repairs, Treatment of Other Expenditures, Amortization of Expenses and Losses, Reasonableness of Operating Expenses in General, Reasonableness of Payments to Other Companies for Service or Commodity and Estimates of Operating Expenses.

The text is a running account of the position taken by the public regulatory bodies on the subjects cited. It is not overstating the case to say that the book is essential to the proper conduct of all work that has to do with the problems of regulation.

Signal Wiring

By Terrell Croft, consulting engineer. Published by McGraw-Hill Book Company, Inc., New York. 1926. 350 pages. $3.

This book on signal wiring consists principally of circuit diagrams. Of these there are more than 460 in the volume. The book is planned for the man who installs signals and who is interested in wiring diagrams. Currents involved with signal equipment are very small and voltages usually are very low. The diagrams have been selected from a mass of available material as those most useful to the average man. The subject matter is divided into 16 divisions. It includes such headings as, Bells and Annunciators, Burglar Alarms, Hospital and Hotel Signals, Time and Program Clock Circuits, Auto Call Signaling Circuits, Telephone Circuits, Fire Alarm Circuits, Watchman and Police Call Circuits, Power Station Signaling, Water Flow and Pressure Alarms, Elevator Signaling, Mine Signals, Railroad Signaling, Miscellaneous Signal Circuits, Batteries, Transformers and Signal Devices, Signal Wiring Methods.

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Personal Items

J. H. McClure to Rehabilitate Another Property

J. H. McClure, vice-president and general manager of the Chicago, Aurora & Elgin Railroad, Aurora, Ill., has been made vice-president and general manager of the Cincinnati & Dayton Traction Company. As noted elsewhere in this issue the Ohio line has been purchased by an Eastern syndicate headed by Thomas Conway, Jr. This property, in which Mr. McClure will be financially interested, is one of a dozen or more similar properties taken over, rehabilitated and sold by these interests. The Cincinnati & Dayton Traction Company operates electric trains between Cincinnati and Dayton, about 50 miles.

Mr. McClure will have direct charge of operation of the reorganized property as vice-president and general manager. Since 1910 he has in turn been in charge of various public utility properties in Pennsylvania, Ohio and Illinois. He was general manager of the Citizens' Traction Company and the Citizens' Light & Power Company of Oil City and Franklin, Pa., from 1912 to 1920. During the latter part of this period he filled the position of vice-president in charge of operation of the Youngstown Suburban Railway, Youngstown, Ohio, and Salem Light Company, Salem, Ohio.

In April, 1920, Mr. McClure went to Lima, Ohio, as vice-president in charge of operation of the Ohio Electric Railway, and in connection with the financial readjustment of the affairs of that company has served as receiver of the Indiana, Columbus & Eastern Traction Company, and as operating manager for the receiver of the Columbus, Newark & Zanesville Electric Railway, with headquarters at Springfield, Ohio. He resigned from this position to take charge of the Chicago, Aurora & Elgin road.

Mr. McClure is at the present time receiver for the Indiana, Columbus & Eastern Traction Company, operating 200 miles of high-speed electric railway in the heart of Ohio.

Earl G. Hines with Brown Boveri

Earl G. Hines has been appointed general sales manager for the American Brown Boveri Electric Corporation in charge of subsidiary company organization and general sales policies of the Brown Boveri Corporation. He is also vice-president of Wilder Electric Trusts, which founded the American Brown Boveri Electric Corporation.

Since 1915, with the exception of eighteen months in 1919 and 1920, Mr. Hines has been with the McGraw-Hill Publishing Company, Inc., as Eastern manager of the *Electrical World* and the *Industrial Engineer*. Previous to this he was with the organization of Harrison Williams, engaged in public utility management and finance, and still earlier in his career he was sales manager for Conger interests in central New York. The American Brown Boveri Electric Corporation has been recently organized with main works at Camden, N. J., and with several American subsidiary companies.

Pierre See President Central Body

Superintendent of Equipment at Akron Made President of Master Mechanics Association

Pierre V. C. See, elected president of the Central Electric Railway Master Mechanics Association at the annual meeting held in Akron last month, is superintendent of equipment of the Northern Ohio Traction & Light Company, Akron, Ohio. To Mr. See his job, like that of the modern physician, is a preventive one. His first aim is to anticipate defects in equipment, and where they do occur to correct them as soon as possible. He keeps his work well organized, but he does not permit detailed reports and statistics to overwhelm him.

P. V. C. See

He grew up from the ranks and has an uncanny faculty of taking in at a glance a shop situation both with respect to men and equipment. Many of his orders are given on the run to his subordinates, but he himself follows up the work, making personal inspections of all activities of the company for which he is responsible wherever he deems them to be desirable.

Not only in the maintenance of electric railway cars but in the maintenance of buses has he made a name for himself. The Northern Ohio Traction & Light Company was one of the first roads in the country to use the bus on an extended scale. In caring for these vehicles Mr. See had to hew out his own path. Here again, as in the railway field, he sought to establish practices that would prevent troubles and defects rather than resort to measures to correct troubles after they had occurred.

As a result of his able handling of the fleet of buses on this property in city, suburban and interurban service, he has won for himself a reputation as one of the foremost bus maintenance men in the United States.

His experience in the railway field covers all types of electric operation. Before he went to Akron Mr. See was superintendent of car equipment for the Hudson & Manhattan Railroad, Jersey City, operating high-speed lines in heavy service. Before that he was general foreman of the Decatur shops of the Illinois Traction System. Previous to that he was general foreman of the shops of the Twin City Rapid Transit Company in Minneapolis and St. Paul. Mr. See's first work in the electric railway field was with the Metropolitan West Side Railroad, Chicago, as foreman and car-builder inspector in the Throop Street shops. He went to this job after he had been graduated from the Armour Institute, Chicago, in 1904 from the electrical engineering department. He was born in New Brunswick, N. J.

For the last two years Mr. See has been chairman of the equipment committee of the American Electric Railway Engineering Association. Previous to that he did considerable committee work, particularly on equipment subjects.

F. T. Hulswit Out of United Light & Power Company

Frank T. Hulswit has resigned from the presidency of the United Light & Power Company, Grand Rapids, Mich., formerly the United Light & Railways Company.

In recent years Mr. Hulswit has been very active as a financier in the utility industry with widespread holdings. He was not only the president and prime mover in the United Light & Power Company but also an organizer and director of the American Super-Power Corporation.

Mr. Hulswit was born in Grand Rapids, Mich., on Sept. 10, 1875. He was the eldest of a family of four boys. He apprenticed himself to a watchmaker at the age of fifteen, but quickly determined that there was no future for him in that line. Civil service in the conduct of the post office offered an opportunity to secure a clerkship in government service. He soon grew restive of the chances for advancement which government service held forth and, opportunity offering in the shape of a job as messenger in the Michigan Trust Company, he quit the post office at a sacrifice of salary and entered what was to be his life work.

The experience gained in the service of the Michigan Trust Company was utilized in 1904 when the firm of Child, Hulswit & Company was formed, to do a general bond brokerage business. The firm dealt largely in the bonds of public service companies, and as the business grew he, as a banker, entered actively into the affairs of the utilities that were being financed through this firm. The organization was enlarged by the addition of experts in gas engineering and in management.

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Joseph C. McCune to Occupy New Post

Joseph C. McCune, connected with the Westinghouse Air Brake Company in various engineering capacities since 1913, has been appointed assistant director of engineering with the air brake organization. Mr. McCune's first employment with the Westinghouse organization was as assistant to the chief engineer. Previous to this connection, he was affiliated with the Cutler-Hammer Company, Milwaukee, and the Pittsburgh Railways.

From 1915 to 1917 Mr. McCune served as mechanical expert for the Westinghouse company in the eastern district, with headquarters in New York. He then spent several years in military service, first on the Mexican border and later in the World War. At the conclusion of the latter, he was made special engineer of the engineering department at Wilmerding, in which capacity he remained for several months. He was then transferred to the eastern district, where he served first as assistant to the district engineer and then as district engineer. He held this position until his recent appointment, which will again bring him to the home office of the air brake company at Wilmerding. Mr. McCune is a graduate of Cornell with the class of 1911. While there he won the first Sibley prize for scholarship and received the degree of mechanical engineer. He is widely known in electric railway, steam railroad and engineering circles.

Richard Schaddelee President of United Light & Power

Richard Schaddelee, Chicago, senior vice-president of the United Light & Power Company, Grand Rapids, Mich., has been elected president of the company to succeed F. T. Hulswit. New directors added to the board are H. B. Rust, president of the Koppers Company; J. S. Brookes, secretary and general counsel of the Koppers Company, and Richard Ingliss of Otis & Company.

M. M. Nash has resigned as superintendent of the Terre Haute division of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind. He had given 24 years of continuous service to the company. His plans for the future have not been announced.

A. M. Farrell, who has been connected with the Wisconsin Power & Light Company as district manager of the Oshkosh branch and general superintendent of the railway and bus systems since January, 1923, has resigned to become sales manager in the states of Ohio, Pennsylvania and West Virginia of the Puncture Proof Compound Company, Milwaukee. Prior to his work at Oshkosh Mr. Farrell was traffic manager of the traction company at Joliet, Ill.

J. I. Beals has been appointed superintendent of the Terre Haute, Ind., division of the Terre Haute, Indianapolis & Eastern Traction Company to succeed M. M. Nash, recently resigned. In the fall of 1925 Mr. Beals resigned as general superintendent of the Monongahela-West Penn Public Service Company, Clarksburg, W. Va., after a service with the company of eight years.

C. D. Porter remains with the Newport News & Hampton Railway Gas & Electric Company, Newport News, Va., as general manager for the General Engineering & Management Corporation. The Newport News property was recently taken over by the Fitkin utility group.

Obituary

Waldo G. Paine

Waldo G. Paine, vice-president and general manager of the Spokane & Eastern Railway & Power Company and the "Inland" system, operating interurban lines out of Spokane, Wash., died suddenly at his home in Seattle on Feb. 20 after a brief illness. He had recently gone to Chicago, but was forced to return home before he had completed the work of his mission to that city. Mr. Paine had been suffering only a short time from heart disease.

Mr. Paine was associated with F. A. Blackwell in the construction of the Spokane & Cœur d'Alene Railway, the first interurban line at Spokane. Since 1903 he had been an executive with that line and allied properties out of Spokane, serving for years as traffic manager. He succeeded as manager F. E. Connors, who died three years ago. Since that time he had been the directing head of the "Inland" lines. Mr. Paine was also a director of the Spokane United Railways, operating the city lines in Spokane.

Waldo Paine was one of the best known operating men in the electric railway field on the Pacific Coast. He was a native of Minnesota, but had been identified with interests in Spokane since 1889. After a period in the real estate business, and a subsequent connection with a mercantile company, he became one of the incorporators of the Spokane & Cœur d'Alene Railway. This company, with others, was later consolidated as the Spokane & Inland Empire Railroad, and Mr. Paine was made general freight and passenger agent. He was appointed vice-president and traffic manager in 1910, following a reorganization of the company.

Calvin H. Allen, 66 years old, real estate and tax agent for the Union Traction Company of Indiana for more than fifteen years, died at his home in Anderson, Ind., recently. At one time he was county auditor at Anderson.

Joseph M. Nougues, superintendent of the Sutro Division of the Market Street Railway, San Francisco, Cal., died on Feb. 20, 1926. He entered the service of the Market Street Railway as a conductor on March 29, 1904, and was transferred as a clerk in the employment bureau a few months later. In 1907 he was appointed superintendent of the Ferry Terminals and two years later, in May, 1909, he became superintendent of the Sutro Division. Mr. Nougues was born in St. Louis, Mo. on March 4, 1873. He was the son of Joseph M. Nougues, for many years city attorney of San Francisco, who died several years before the fire of 1906.

Sterling P. Anderson, auditor of the Tennessee Public Utilities Commission for the past five years and former state auditor, died recently. He was an important figure in the civic life of Jackson, Tenn., for many years.

Henry M. Ballard, for 20 years an executive of the old West End Street Railway, Boston, Mass., and at one time its electrical engineer, died recently. For several years he was with the Thomson-Houston Company in Lynn.

Edmund J. B. Huntoon, for many years asociated with Stone & Webster, Inc., Boston, Mass., died at Milton, Mass., March 8. He was born in Canton, Mass., in 1868, and was graduated from the Massachusetts Institute of Technology in 1889. He was active in the earlier electric railway construction of Stone & Webster, and at the time of his death was identified with the securities department of that organization.

Frank Andrew, who had been president of the Electric Railway Equipment Company, Cincinnati, Ohio, died on March 5, at Fort Myers, Fla., where he was spending the winter. Mr. Andrew went to Florida two months ago, in an effort to improve his health. He was one of the founders of the company, a Mason and a member of the Cincinnati Chamber of Commerce. Mr. Andrew was 80 years old.

Herbert E. Bradford, a pioneer electric railway man in New England, and at one time president of the New England Street Railway Club, died at Providence, R. I., on March 6 at the age of 67. He was a native of Claremont, N. H., and during his career was superintendent of the Marlboro Street Railway, the Worcester Consolidated Street Railway and of the Bay State lines in Newport, R. I. Mr. Bradford was in the automobile business at Providence at the time of his death.

Murray Carleton, during recent years vice-president and director of the United Railways, St. Louis, Mo., died in that city on March 2. For many years he had been a leading figure in the commercial activities of St. Louis. He was never active in the railway on its operating side.

Charles E. Hubbard, formerly well known as an electric railway official, died at Hartford, Conn., on Feb. 19. Mr. Hubbard was born in Essex, Conn., in 1868. He went to work for the Farmington Street Railway, one of the first lines that was built at Hartford, Conn., in 1898, was purchasing agent for the company and later became secretary and general manager. In 1910, when the company was taken over by the Connecticut Company, he became purchasing agent for the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, where he remained until 1914. He then returned to Hartford and went into the building supply business, with which he was connected at the time of his death. Mr. Hubbard was interested in politics and was a member of the Common Council of Hartford in 1917 and 1918. Later he became police commissioner

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Good Will Fostered by Advertisements

Westinghouse Company Has Prepared Collection of Boosters to Assist Railway Industry

In an effort to secure better public understanding of the economic service rendered by the electric railways, the Westinghouse Electric & Manufacturing Company has for the last eight years been conducting a series of good-will advertisements in the leading national popular magazines. The company believes that there is today, on the part of the general public, a commendable increase in knowledge and appreciation of the tremendous importance of adequate transportation facilities, especially those facilities as represented by the service furnished by electric street and interurban railways.

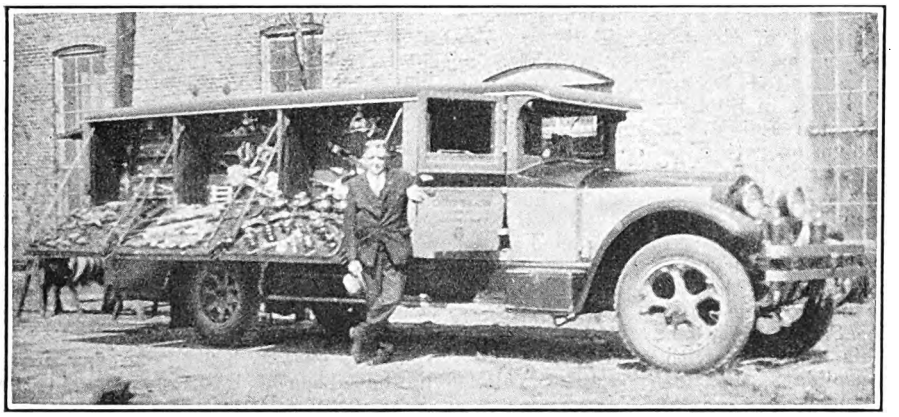
The Westinghouse company has endeavored further to strengthen public understanding of the electric railway industry, which represents an investment at the present time of $6,000,000,000, with securities held by 1,300,000 people and operating 105,000 cars on 50,000 miles of track in the transportation of more than 16,000,000,000 passengers annually. Facts such as these have been stressed in the consistent program of advertising which has been conducted in the *Literary Digest, Scientific American, Forbes, Collier's,* the *Nation's Business, Saturday Evening Post* and many financial papers in recent years.

The most important of these good-will advertisements are reproduced in special publication 1751, entitled "Electric Railways—the Keystone of Progress." This has just been issued by the Westinghouse company and is available to any who desire copies. The advertisements reproduced in this book represent a combined circulation of 26,324,000, or, in reality, that number of individual messages delivered in behalf of the electric railway industry.

An important feature in connection with this publication is that the Westinghouse company announces its desire of sending to any railway company free of charge either mats or electrotypes—for either newspaper or magazine reproduction—of any of the advertisements included in the publication. Copies of the booklet may be obtained from the nearest Westinghouse office or direct from the department of publicity at East Pittsburgh.

A Traveling Exhibit

A feature of the recent meeting in Mobile of the Electric Railway Association of Equipment Men of Southern Properties was the presence of one of the exhibit trucks of the Ohio Brass Company. These trucks, of which there are two, are fitted with racks for the display of the latest type of insulators, overhead line material and other equipment, light in weight, manufactured by the Mansfield concern. This material is attached to the sides of the truck so that when the sides are dropped down the exhibit can be seen to very good advantage. The trucks can be driven from city to city to show the material as occasion requires.



Ohio Brass "Drops In" at Mobile Meeting

The accompanying illustration is reproduced from a photograph taken in front of the repair shops of the Mobile Street Railway at the time the delegates to the Mobile meeting visited these shops. Fred W. Roth of the car equipment division of the Ohio Brass Company was in charge of the truck. He is shown in the picture standing in front of the truck.

G. E. Cullinan Promoted by Graybar

George E. Cullinan has been elected vice-president in charge of sales and a director of the Graybar Electric Company. He has had 24 years service with the Western Electric Company, during which time he has risen from a clerical position to the post of general sales manager of the supply department. Mr. Cullinan's first important position was that of chief storekeeper at the New York distributing house. He held that position until 1907 and was then transferred to the St. Louis branch, where he continued to advance rapidly, becoming Western district manager in 1908 and later central district manager in Chicago. When the supply department became a distinct organization of the Western Electric Company in 1923 Mr. Cullinan returned to New York as general sales manager, a post which he has held until his latest promotion.

Detroit Wants Tires on a Mileage Basis

Proposals for rental and maintenance of tire equipment on 125 gas-electric double-deck motor buses are being requested by the Detroit Department of Street Railways. The option of adding one to 300 additional buses during the life of the contract will be included. Bids will be opened on March 22, the same date as the opening of bids for furnishing the department with the double-deck buses on which the tires will be used. The contract is to cover the period expiring Dec. 31, 1926. Mileage will be computed from the records of the Department of Street Railways.

Each bus specified is to be equipped with six 38-in. x 8-in. pneumatic tires. The successful bidder shall carry in each of the garages of the D. S. R. a number of spare tires equal to 10 per cent of the total number of tires on buses being operated from that garage.

The contract is to include all repairs on all tire failures in operation and daily inspection by the successful bidder. Coaches will be equipped with tires of the manufacture of the successful bidder.

The basis of prices of bidders is the bus mileage, each bus to be operated approximately 100 miles a day. The D. S. R. reserves the right to purchase the tire equipment at the expiration of the rental period if it so desires, less the amount paid as rental on such tires as may at that time constitute such equipment, or to use such tires until unfit for further service, paying for them at the contract rental price.

Metal, Coal and Material Prices

Metals—New York	March 9, 1926
Copper, electrolytic, cents per lb	14.175
Copper, wire base, cents per lb	16.00
Lead, cents per lb	8.575
Zinc, cents per lb	7.75
Tin, Straits, cents per lb	64.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.475
Somerset mine run, Boosn, net tons	2.075
Pittsburgh mine run, Pittsburgh, net tons	2.05
Franklin, Ill., screenings, Chicago, net tons	1.675
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb	10.7
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal.	$1.00

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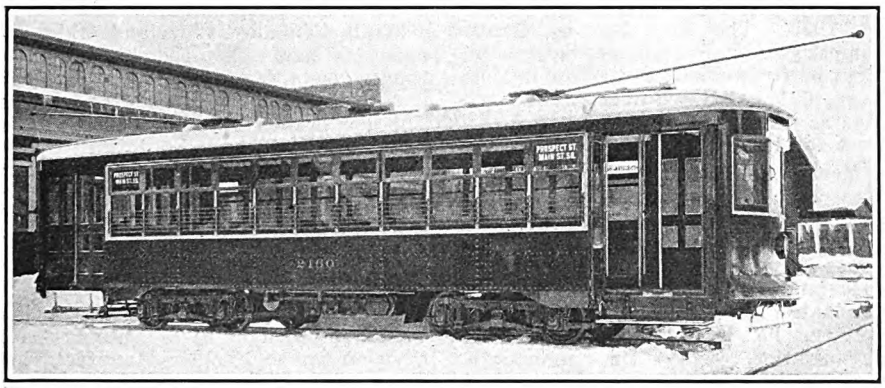
Car Lighting to Be Improved by Standardized Lamps

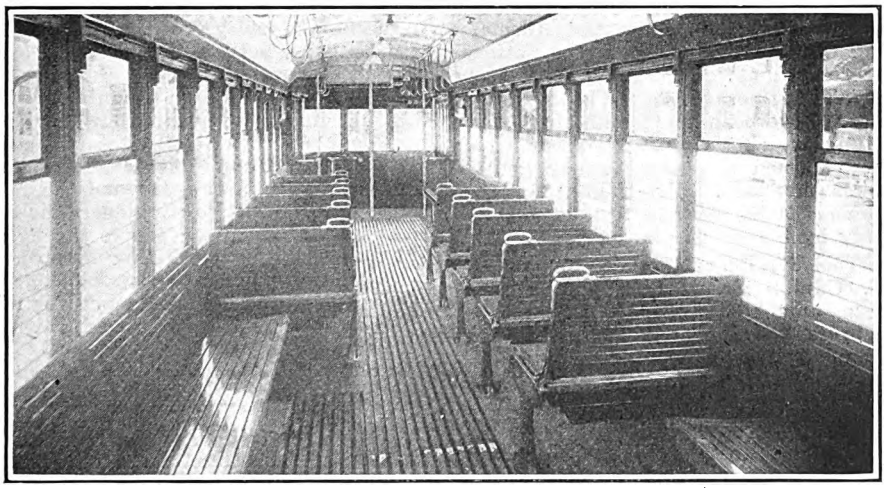
Standardization of the equipment used in the construction and maintenance of street cars has been acknowledged as one of the greatest boons attainable by the industry. Perhaps the latest definite step in this direction was the announcement made last month of the completion of the new standard line of "Mazda" lamps. The first of these lamps, a new 25-watt inside-frosted type, was placed on the market last July. The second lamp of this new line, the 100-watt inside-frosted type, became available on Nov. 1. Also three intervening sizes of 60, 50 and 40 watts respectively, all of the inside-frosted type, are now available.

For years the lamp industry has been directing its efforts to the simplification and standardization both of its line of lamps and its processes and equipment used in making them. While lamp voltages and lamp bases had been reduced in variety, there still remained considerable room for the advancement of a more complete standardization program. The present program affects the assortment of lamps of 100 watts and smaller, which are particularly applicable to car lighting service.

Careful study of requirements to be met in service has shown that the 45 different lamps of several sizes, types and finishes (not counting the three usual voltages of 110, 115, and 120) which existed in the field can be replaced by a single series of but one uniform type of finish.

Data on 25 Cars for United Electric Railways





Good Visibility Provided in New Cars for United Electric Railways of Providence, R. I.

Delivery of 25 type DJ one-man, two-man cars to the United Electric Railways, Providence, R. I., which were ordered from the Wason Manufacturing Company last September, was begun in January. The cars will seat 44 passengers. Specifications follow:

Weights:	
Car body	15,800 lb.
Trucks	15,200 lb.
Total	31,000 lb.
Length over all	41 ft. 0 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 1 in.
Height, rail to trolley base	10 ft. 11⅛ in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	⅛-in. Agasote
Roof	Arch
Air brakes	Safety Car Devices Co.
Armature bearings	Plain
Axles	4½-in. gear fit, 4-in. diameter
Bumpers	Channel iron
Car signal system	Consolidated electric buzzer
Car trimmings	J. L. Howard Co. statuary bronze
Compressors	DH-16
Conduits and junction boxes	Special
Control	Two K-35
Couplers	Bar
Curtain fixtures	Curtain Supply No. 89, pinch handle
Curtain material	Pantasote, double-faced
Destination signs	Hunter illuminated
Door-operating mechanism	National Pneumatic
Fenders	H-B lifeguard
Finish	Pratt & Lambert enamel
Gears and pinions	G.E. solid
Hand brakes	Peacock type G-14; 34
Heater equipment	Gold 500-watt single coil panel and 250-watt cross seat
Headlights	Crouse-Hinds ZL 28540 incandescent
Journal bearings	Plain
Journal boxes	Brill standard
Lightning arresters	General Electric MD-3
Motors	Four GE-265 A, inside hung
Sanders	Ohio Brass
Sash fixtures	Howard sash lock and anti-rattlers
Seats	Brill "Waylo"
Seating material	Wood slat
Slack adjuster	Brill automatic
Springs	Brill
Step treads	Mason
Trolley catchers	Wilson type "T"
Trolley base	Two GE
Trolley wheels	General Electric
Trucks	Brill 177-EX
Ventilators	Brill exhaust
Wheels	Steel, 27-in.

New Detroit Buses Will Have Inclosed Decks

In many respects the 150 new buses for which bids have been asked by the Department of Street Railways, Detroit, Mich., will be similar to those of the double-deck type now in operation in that city. However, the specifications call for completely roofed and inclosed upper decks, able to pass unladen under 13-ft. viaducts. They are to have a low center of gravity, to be easy riding and to be arranged for either one-man or two-man operation. Sixty passengers are to be seated, 27 on the lower deck and 33 on the upper.

The door from the rear platform into the body will be of the jack-knife type, air-operated and opening outward. Treadle control will lock the brakes while the door is open. The front door will be of the double jack-knife type, opening outward.

Some of the principal specifications follow:

Weight, maximum	19,000 lb.
Length over bumpers, approx.	30 ft.
Length over body, approx.	27 ft. 3 in.
Width over all, maximum	96 in.
Height over all, maximum	12 ft. 10¾ in.
Wheel base, minimum	230 in.
Headroom inside body:	
Lower deck at rear	6 ft. 2 in.
Lower deck at front	6 ft. 4 in.
Upper deck	71 in.
Front and rear entrances	69 in.
Floor, height from ground	22⅝ in.
Framework	Second growth seasoned ash
Roof:	
Upper	Haskelite, ⅛ in.
Lower	Monitor, steel construction
Headlining	Aluminum
Inside finish	White enamel
Sash	Curtain Supply Co.
Interior finish:	
Lower deck	Corrugated aluminum matting
Upper deck	Pyramid aluminum matting
Seats	De luxe
Seat spacing	29 in.
Heating	Exhaust through steel tubing around sides of body
Lighting	Keystone
Bumpers:	
Front	Spring type—extra heavy
Rear	Two 3-in. channels
Signs	Hunter illuminated
Engine	six-cylinder
Steering gear	Ross cam and lever type
Generator	GE-1098, 125 volts, 200 amp. at 1,200 r.p.m.
Motors	Two GE-1079—126 volts, 85 amp. at 1,640 r.p.m.
Brakes	Air, manual and electric regenerative
Wheels	Budd pressed steel disk, dual rear

Large Order for Rails for Hanshin Railway

An order for 32 miles of 91-lb. rail has recently been placed with United States rail manufacturers through the medium of Mitsui & Company. These rails are for the Hanshin Electric Railway in Japan and were awarded through Mitsui & Company on the basis of furnishing American open-hearth steel rails. The contract was let in spite of sharp European competition and efforts to discredit American steel products in Japan.

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Rolling Stock

New York Rapid Transit Corporation, New York, N. Y., has had its award of contracts for the purchase of 201 steel subway cars approved by the Transit Commission.

Union Traction Company of Indiana, Anderson, Ind., has been granted the petition recently made by Arthur W. Brady, receiver for the company, for authority to buy bus equipment of the Hoosier State Lines at a price of approximately $135,000. The petition was granted by the judge of the Circuit Court at Anderson, where receivership proceedings had originally been brought. There are at present sixteen buses on the Hoosier Lines and it is expected that additional equipment will be purchased from Mack Trucks, Inc. Mr. Brady stated that leases on bus stations used by the Hoosier Stage will be sought, and that several other details will require attention before the final transfer of the bus equipment is made.

Track and Line

Wisconsin Gas & Electric Company, Kenosha, Wis., plans to lay double tracks on Sheridan Road between South and Elizabeth Streets and contemplates double tracking on Milwaukee Avenue as far as the Bronson Street siding. This is part of the 1926 program of improvements.

Georgia Railway & Power Company, Atlanta, Ga., spent approximately $700,000 for trackwork, paving and miscellaneous improvements during 1925. Of this sum more than $303,000 was spent in building additional track facilities and in rebuilding tracks necessitated by city paving projects. The annual report of the roadway department shows an expenditure of $100,000 for paving work ordered by the city.

Arkansas Central Power Company, Little Rock, Ark. will extend its Fifteenth Street car line a distance of seven blocks, if the Public Utilities Commission grants the petition requesting the city to act toward obtaining this extension.

Los Angeles Railway, Los Angeles, Cal., will spend approximately $75,000 in the reconstruction of the car tracks on East Seventh between San Pedro and Alameda Streets in the near future. The job will include the laying of 6,000 single track feet of heavy girder rail, and the repaving of the surface of 64,200 sq.ft. at a cost of more than $15,000.

United Railways, St. Louis, Mo., has applied to the St. Louis Board of Public Service for a permit to construct a new loop for the Wellston division cars extending north from Easton Avenue on Theodosia and thence westward to the present terminus of the line. The company also asked the Public Service Board to authorize the abandonment of a single track of the Bellefontaine line on portions of North Ninth, North Tenth and Hebert Streets. If permission is given the company will have a double track on north Eleventh Street. This arrangement will straighten out several bad curves and also give North St. Louis two important non-street car thoroughfares in that section. North Ninth and North Tenth Streets are to be repaved this year.

Trade Notes

Root Spring Scraper Company, Kalamazoo, Mich., manufacturer of spring scrapers and steel life guards for electric railways, states that it is now manufacturing the snow scrapers for the new Grand Rapids cars, ordered from the St. Louis Car Company. Details of these cars appeared in the ELECTRIC RAILWAY JOURNAL for Dec. 26, 1925. The Root Spring Scraper Company further announces the appointment of Grayson Railway Supply Company, 601 LaSalle Building, St. Louis, Mo., as its representative in the Southwest for the sale of snow scrapers.

Herman Steinkraus has recently assumed the representation of Bridgeport Brass products in the Cleveland territory in charge of sales and its warehouse service. He has resided in Cleveland for a number of years. A graduate of Western Reserve University, he has handled sales and organization work in managerial capacities for the Cleveland Automatic Machine Company, the Cleveland Chamber of Commerce, the Advertising Club of that city and the national secretary's office of the National Young Men's Business Clubs. The last eight years have been spent with the Osborn Manufacturing Company, from which he resigned not long ago as general sales manager. Mr. Steinkraus' continuous sales service was interrupted only by his service in the World War.

Tool Equipment Sales Company, 18 S. Clinton Street, Chicago, Ill., has been appointed the exclusive factory representative of the Bicknell-Thomas Company, Greenfield, Mass., manufacturer of tapping equipment. A complete stock of this company's product will be maintained.

Ludlum Steel Company, Watervliet, N. Y., announces that T. Holland Nelson, internationally known rustless steel expert, has become associated with the company in a consulting capacity in connection with the production of rust and corrosion-resisting iron and steel. Mr. Nelson is also vice-president of the William T. Bate & Son Company, Conshohocken, Pa. He is well known as a lecturer on problems of rust and corrosion, and has been intimately connected with the development of rustless steel both in this country and in England.

Fageol Company, Kent, Ohio, delivered fifteen motor coaches to the Miami Beach Railway, Miami, Fla., during the period from Jan. 15 to Jan. 31. These were six-cylinder gas-electric buses with the electrical equipment supplied by General Electric Company. The coaches are fitted with Westinghouse air brakes.

Railway Materials Corporation, Toledo, Ohio, has purchased and taken over the business and good will of the Railway Materials Company of Ohio. There has been a complete reorganization, and the following officers were elected: President, E. C. Folsom; vice-president, B. J. Farnham, secretary and treasurer, James P. Schrider.

Dale P. Cartwright, who sailed in January, 1925, on a year's tour throughout Europe and to the Orient in the interests of the North East Electric Company and North East Service, Inc., has just returned to the home office in Rochester, N. Y. In addition to calling upon dealers handling buses equipped with North East products. Mr. Cartwright visited North East foreign service stations in order to build up closer relations with them. In a number of countries he established new NorthEast service stations.

White Company, Cleveland, Ohio, has opened a new direct factory branch in Omaha, Neb., for the selling and servicing of White motor trucks and buses. The new branch sales offices and service department will be located at 1310-1316 Jackson Street. Dean M. Gillespie, former Denver salesman, has been appointed branch manager and A. F. Burgdorf, former St. Louis shop superintendent, becomes service superintendent at Omaha.

Mark A. Smith has been made assistant sales manager of the Motor Coach Division for the Yellow Manufacturing Sales Corporation. He was formerly district representative in Philadelphia. In his new capacity, Mr. Smith will supervise sales activities of the various district representatives. Before he joined the Yellow Coach organization in the fall of 1924, Mr. Smith was vice-president of the Royal Motor Coach Company. Through his long association with the bus industry and the Society of Automotive Engineers he is well known to railway people throughout the country. The Yellow Manufacturing Sales Corporation was recently organized as the selling agency for all Yellow truck and coach products with the exception of G.M.C. truck. It is headed by T. L. Emerson as president.

Advertising Literature

Alexander Milburn Company, Baltimore, Md., has issued a catalog describing various types of Milburn cutting and welding torches. A special type of torch is provided for various applications and differing maintenance requirements.

Fageol Motors Company, Oakland, Cal., has issued a booklet describing the various features of its gas-electric buses. Technical data on the electrical units supplied by the General Electric Company are included, as well as speed time curves showing the acceleration of the Fageol gas-electric unit with a weight of 16,500 lb., a competitive gas-electric unit with a weight of 17,620 lb. and a mechanical unit, manufactured by the same competitor, with a weight of 14,120 lb.

Smith & Gregory, Inc., New York, N. Y., has issued a novel folder calling attention to the Gruss air spring manufactured by the Cleveland Pneumatic Tool Company, Cleveland, Ohio. These air springs may be applied to trucks, buses and passenger cars.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

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Maintenance Men Have an Important Part in Merchandising Transportation

TO THE maintenance man the subject of merchandising transportation has sometimes seemed outside of his immediate interest. He has been inclined to consider merchandising problems as of immediate interest only to the transportation department and the management. Too often the same viewpoint has been taken by the management relative to the maintenance man's relation to merchandising problems. Economy has been the keynote in considering the activities of the men responsible for the equipment, track and line.

There are some notable exceptions to this condition. In the case of one Southern property, maintenance men were asked to join with the transportation men in submitting slogans to be used in attracting new riders. That mechanical men will react to the spirit of the selling idea was demonstrated by the fact that these men brought in slogans that were easily the equal of those submitted by other members of the staff.

But it is not in writing slogans that mechanical men have their greatest opportunity for helping to sell rides. On them rests the responsibility for the physical condition of the property with which the service must be rendered. And if the service is not up in quality, no amount of merchandising activity can hope to be permanently effective. The proof of the salesman's promises lies in the character of the commodity offered. If the goods are not up to standard, the salesman is an unwelcome visitor, and advertising becomes ridiculous.

Thus the maintenance man supports the entire merchandising structure. Unless this is realized both by them and by the management, sales effort is foredoomed to failure. Dirty cars, rough track and interruptions to service due to equipment defects or broken trolley wire are comparable in transportation service to a dingy store, unreliable delivery or faulty merchandise in a mercantile business. No amount of sales effort or publicity will permanently avail under these conditions.

There is a strong tendency, particularly when receipts are falling off, to screw down on maintenance expenditures to the utmost. The result, if this policy is continued, is to aggravate conditions. More infrequently, perhaps, maintenance men have been tempted to make a showing of efficiency and economy by themselves taking the initiative in deferring necessary work at the expense of the condition of the physical property.

In either case the best interests of the property are not being served. Proper facilities, tools and machinery are essential to efficient work and ultimate economy. The merchandising viewpoint is as important in making out the maintenance budget as in the case of advertising. In fact, when funds are limited it may be wise to hold the latter to a minimum until the physical property has been brought up to first-class condition.

Progressive maintenance men are today looking at their work from a merchandising perspective. This is shown by the articles in this issue. Whether the immediate interest is maintenance of equipment, track or overhead line, the opportunities for helping to sell rides are present on every hand. In proportion as he accepts this modern viewpoint and puts it into practice will the maintenance executive rise to his present opportunity.

Paint Is the Cheapest Publicity for any Transportation Company

"PAINT, Publicity and Politeness" is the slogan with which one progressive railway manager carried his road to prosperity not so many years ago despite adverse conditions. While it was in the days when painting had to be done entirely by hand and hence was expensive, he realized that it was the cheapest form of publicity in which the company could invest. Attractively painted cars, with appropriate striping and lettering, were the mute evidence that his road was ready to give its patrons good value for their money. With that background politeness of the men was all the easier to obtain.

Today, when costs have mounted in nearly every department, modern methods have made it possible to reduce sharply the cost of car painting. Furthermore, they can be made to do a better job than that to which the public has become accustomed in recent years. New paints and lacquers have been developed that cut the time a car must be out of service for painting from two or three weeks to as many days. The use of the spray brush makes it possible to get coverage and protection of the surfaces in inaccessible places more effectively than the hand brush ever could do, unless perhaps in the hands of experts. Stencils and cutouts facilitate the lettering and striping, and masks make the use of two-tone or three-tone effects but little more expensive than a single color.

The most successful companies have made it a practice to keep their equipment so well painted that it is hard to tell which are the new cars and which the old. A few new cars, brightly painted, accentuate the difference and show the public that really the remainder of the rolling stock is in deplorable shape. So when a program of modernization of rolling stock is under way, care should be taken to keep up the appearance of the remainder, and the public will feel that the standard of the entire road has been lifted to a new level.

Referring back to the slogan, "Paint, Publicity and Politeness," it is easy to see that the two first items are so closely allied that the one begets the other. In creating favorable public sentiment and in attracting riders to its vehicles, there is nothing which will bring greater returns than a liberal use of paint.

This is the issue in March that is devoted essentially to maintenance subjects

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Labor-Saving Equipment Gives Reduced Maintenance Cost

CARS are too valuable and their earning capacity is too great to justify holding them in shops for long periods of time. A modern repair shop may be small, but it should be provided with the last word in labor-saving equipment in order to keep the cars on the road. Modern cars cost in the neighborhood of $15,000 each. In order to keep the investment working as nearly full time as possible, a considerable investment in modern shop equipment is justified. One of the principal factors in rapid repair of car equipment is to provide cranes, telphers, hoists and like equipment for handling and transporting parts to the particular locations at which they are to be repaired. Work in overhauling cars starts with the removal of the trucks from the car body and continues through different dismantling processes where the various equipment parts are removed and transported to repair sections or to the particular machine tools on which the work is done. It is better to put money into the best means of doing a job in a shop rather than to invest a smaller sum in a slower, less efficient substitute which may delay the return of the car to service.

Cranes, hoists and telphers are but a part of the equipment required for equipment handling. The use now made of truck tractors by electric railways is small, but these can be employed to great advantage and with a material reduction in labor cost. Several of the larger electric railway systems are using them and find that many parts can be handled by one man in less time than was taken by several laborers previously. The type with elevating platform is particularly convenient for removing equipment from cars and depositing it upon the repair bench and after repairs are made for reinstalling the equipment under the car body.

The value of any labor-saving device must be judged by its ability to perform a greater quantity of work of the same or a better quality than is possible with hand labor; in other words, by its ability to decrease labor costs without sacrificing quality. That it is possible to do a larger amount of work with the same number of men is no recommendation for the use of a tool if the work performed will not stand up as well as work done by hand, and if the cost over a period of time will equal that of hand labor. Nor is its purchase justified if the first cost and the maintenance expense over its normal term of usefulness are greater than when the work is performed by hand labor.

It Is Important to Know When to Stop Maintaining Old Cars

MUCH has been said about the low maintenance costs that result from new cars, and there are many examples of roads on the brink of disaster which have been made to pay good returns as a result of new cars and better service. The proportional decrease in maintenance expense where new cars have been substituted for old has been given as varying from 35 to more than 50 per cent. Differences in maintenance costs result from many factors apart from the cars themselves, such as the tracks over which they operate, the service conditions, weather conditions, and the extent to which the equipment is subjected to overload.

All railways are anxious to take advantage of the reduced maintenance cost which results from new cars, and those managements that have secured new equipment should devote their efforts toward continuing the low maintenance cost. Even though the cars be new they still require careful maintenance, or soon the low costs will disappear.

In addition to an adequate degree of maintenance for all cars, both new and old, a sound policy of retirement for the old equipment must be adhered to, so that equipment owned may be reasonably modern and capable of meeting the different requirements without needing constant attention. There is a rather well-defined line of demarkation beyond which it is more economical to retire equipment and replace with modern units rather than to repair and modernize with betterments. The dividing line, of course, varies with market and labor conditions and is affected by financial considerations. Obsolescence is not a constant, but is affected by the introduction of inventions and by the demands of passengers for improved service.

New equipment produces marked reductions in maintenance expense, which is essential in producing ultimate economies. With the added investment resulting from the purchase of new equipment comes also an obligation on the part of maintenance departments to develop the shops, tools and organization needed for keeping cars in proper condition. Close supervision and a specialized organization can effect material economies and at the same time keep the equipment in the high state of repair that is essential.

Co-ordinating Car and Bus Maintenance Avoids Wasteful Duplication

FEASIBILITY of co-ordinating maintenance on electric railway cars and buses depends largely on the size of the particular property under consideration. For small companies, it is obvious that it would not be economical to have separate facilities and separate organizations for the two kinds of work. Where the number of vehicles of each type runs into the hundreds, on the other hand, there is so much work to be done that it is possible to specialize it to a great extent. Between these two extremes is a wide middle ground where the manager must use his own discretion to decide the question. Prevailing opinion, however, appears to favor co-ordinating the work as far as possible to avoid duplication.

Certain kinds of maintenance work are similar for both cars and buses. For example, painters, carpenters, fare box and register repairmen, blacksmiths, and to some extent even machinists, can ply their trades equally well for either type of vehicle. More efficient use of the men's time, as well as greater flexibility in the operation of the shop, is secured by having them work indiscriminately on cars or buses as occasion demands.

Separate maintenance personnel will be required for certain other types of work, however. Electric motors, gears, brakes, wheels and trucks of railway cars must be handled by specialists, as must the gasoline engines, transmissions, differentials, carburetors, tires, etc., of the buses. One way to meet this need on larger properties is to have a man of this type for each specialty traveling constantly among all the shops, carhouses or garages on the entire system.

In general, it is probable that there will be enough

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regular inspection work to be done, even on a small railway property, to justify separate inspection personnel for cars and buses. Cleaners might well be kept separate also, as there is a considerable amount of this work to be done, and it must be performed somewhat differently on the two types of vehicles.

Regardless of how far it may be advisable to go in the use of the same men and the same facilities for these two kinds of work, there are certain advantages in the employment of experienced electric railway men for bus maintenance. They have the transportation viewpoint concerning readiness for service, which it would take a long while for an outsider to acquire. They know the kinds of defects to watch for, the necessity of having all the equipment ready for use in rush hours, and many other little tricks of the trade. Of course care must be exercised in the selection of men with the right kind of experience. Track greasers should not be employed on automotive engine work, or other unskilled labor on delicate jobs. Selection of the proper men, however, will produce close co-operation on account of the feeling of mutual understanding resulting from having a common basis of past experience.

Track Crossings that Reduce Noise Are Desirable from Many Viewpoints

WITH renewed confidence in electric railways comes a desire to improve their operation. Many things are needed. While much has been accomplished in noise reduction, the next few years will undoubtedly see great progress along these lines. One of the worst offenders has been the noisy crossing. Any well-made crossing is good until it breaks, and then it ordinarily remains in use for many months before it is replaced, but the noise is accentuated at once, to say nothing of the damaging effect on the equipment passing over it.

Much expense goes into repairs of broken special work, though they oftentimes are successful only to a limited degree. It is not easy to weld alloy steel successfully and get a permanent job. The alloy in the original case is made, cast and tempered under the supervision of a metallurgist. It is impossible to duplicate this in practical welding processes.

Elsewhere in this issue is the story of Cleveland's attempt to eliminate noise by adopting a crossing type heretofore largely used by the steam railroads. Its popularity with the steam roads has been largely because it wears out before it breaks. This very feature, aside from the economy it produces, is the essence of the noise reduction feature. After adopting this design developed by usage on the steam roads, two important features were incorporated to improve the product for use in paved streets. The principle of flange running was adopted so that the wheel rolls on the flange over the entire crossing. Also by use of the flange block the wheel tread does not come in contact with the rail head at the joint with the crossing leg, thus avoiding a battered rail end.

In this way noise is reduced, first, through a design that permits flange running and, second, by eliminating breakage of the crossing elements. To be sure, a crossing of this type costs slightly more initially than the solid manganese type, and either costs about twice as much as the bolted type built up of rail and guard sections. The ultimate answer, however, is in the service obtained. The more expensive type through longer life may be the cheaper in the long run. Cleveland's answer is in ordering more crossings of this type after a four-year test, with as yet no failures despite the density of service on Euclid Avenue and at the other points where they are used.

When Maternity Cases Overrun the Operating Ward

MAINTENANCE shops, as their name implies, might be likened to an operating ward in a hospital. There the victims of disease and accident are brought, their condition ranging from acute to mildly serious, to have the broken parts mended, the infected parts removed, and perhaps new organs and features grafted. But alas for the inhumanities of the *genus homo!* How frequently have railway officials been wont to ignore the plaintive cries of the sick, the halt and the hurt and have hung the "maternity ward" sign on the door of a perfectly good maintenance shop. Building new cars instead of repairing old ones, making new parts for the repairs instead of purchasing them—burying the true cost of the process under a mass of complicated bookkeeping, so that when the infant finally sees the light of day no one can say how far the proud papa—the railway company—has had to dig down in his jeans—no wonder the accounting departments have petitioned for a psychopathic ward for the personal use of their staffs.

When a patient of long standing comes knocking at the door he is all too apt to be informed that accommodations are lacking—unless his is a case of life and death, when perhaps he may be grudgingly admitted for a brief treatment—and he perforce goes back for another 20,000 miles of "grin and bear it." Perhaps this is a far-drawn analogy. Nevertheless it is true that the practice of building new cars and parts in railway maintenance shops, originally undertaken to make use of shop equipment standing idle in off hours of maintenance work, has sometimes grown to a monster which has all but destroyed its creator.

It is not a question of the right of railway companies to enter into direct competition with car builders or equipment manufacturers. As Thomas Elliott recently said, their justifiable activities in this direction are determined entirely by their abilities to build better cars than they can buy. But the activities of a railway in the operating field alone are manifold. Its reputation is built upon the service it gives, not upon the cars it manufactures. If it unconsciously neglects that service in developing and expanding its activities to other lines, such as that of manufacturing, it will be the one that must ultimately pay the piper.

Maintenance is one of the most important features of proper railway service. If a hard and fast line could be drawn and maintained between maintenance activities and manufacturing activities, the problem would not present the difficulties which it does. It seems, however, that efforts made in this direction have not met with entire success. To keep the bookkeeping straight, so that items properly chargeable to manufacturing are not foisted upon the already overburdened maintenance account, requires much ingenuity. It would seem better, in this day of specialization, for the operator to concentrate on operating details and to leave production details in the competent hands of the car and equipment manufacturers. Certainly he would be able to toss a large bundle of grief overboard were he to do this.

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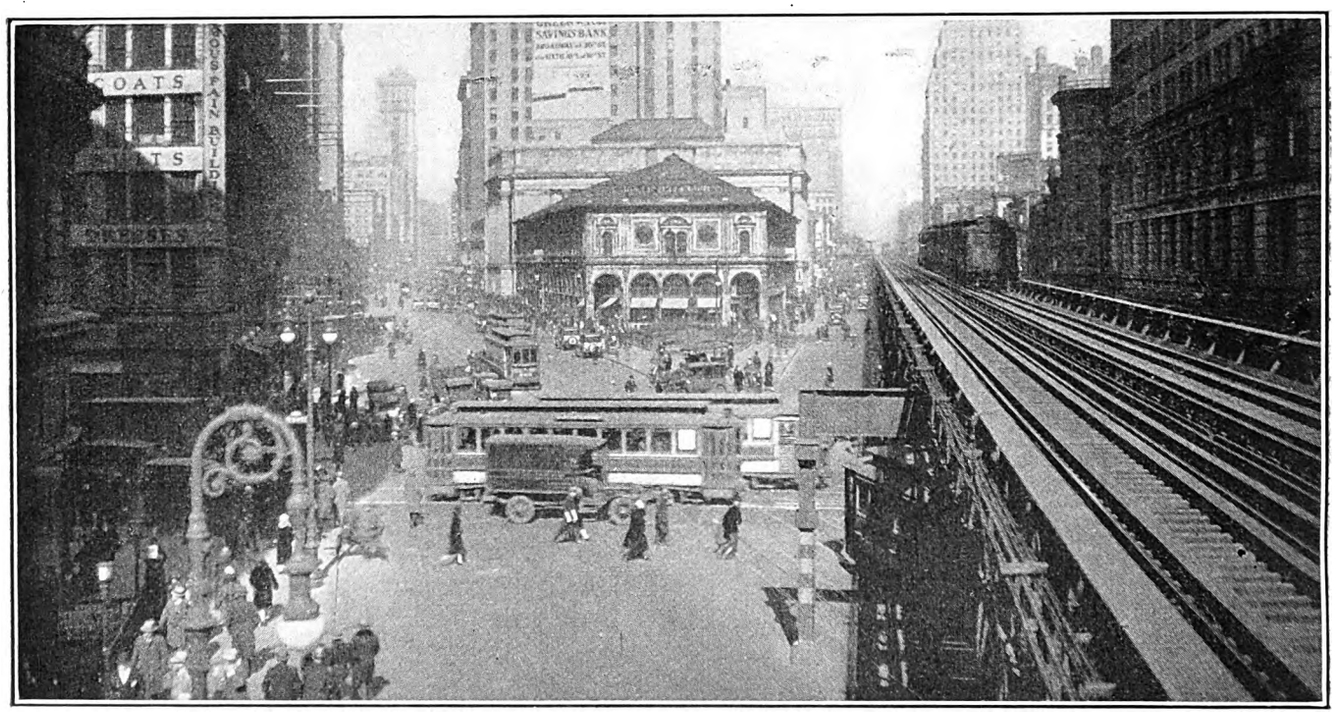
Car Noises from Inadequate Maintenance Demand Attention

Closer Limits for Wheel Wear—Less Side Play—Gearing Properly Centered—Closer Bearing Fits—Oiling of Springs and Close Attention to Brake Rigging Are Some Things that Will Increase Attractiveness of Electric Car Riding by Reducing Noise

By H. S. Williams
Assistant Superintendent of Equipment,
Department of Street Railways, Detroit, Mich.



The Noisiest Corner in New York City. Elevated, Subway and Surface Cars, Combined with Congested Street Traffic, Make the Junction of Broadway, Sixth Avenue and 34th Street Disagreeable

A SUBSTANTIAL reduction of noise in car operation is possible by proper maintenance, but it is a formidable contract for the equipment man, and yet it is absolutely necessary that it be done. The various points to be considered and the work to be done can be carried along gradually in the course of routine car overhauling.

To plunge directly into the subject, let us start at the source where we find two principal things operating to produce noise, i.e., metal wheels rolling on metal track, and motors with their gearing. In order to get the least possible sound from wheel and track it is necessary first that each be in as perfect condition as possible. It is hardly necessary to point out that the track must be smooth, in good alignment, free from low joints and corrugation, all of which spells high standard of maintenance. The next thing is the car wheel, and this has many noise producing possibilities. To start with, the wheel must be true—that is, it must be perfectly round, accurately centered and with smooth tread. With steel wheels there is little probability of starting out otherwise; but with chilled iron wheels it is different, and it may be necessary to grind them to produce accuracy and smooth finish. These points are self-evident and require no further argument.

It has been thought by many equipment engineers that improvement can be effected by pressing wheels on the axles to a wider gage; the idea being that with less side play there will be less tendency toward nosing and oscillation, with a resulting reduction of wear and noise. In this connection it is worthy of note that the standard A.E.R.A. wheel gage is now made 4 ft. 8⅛ in., instead of 4 ft. 8¼ in. It appears that the present practice of condemning steel wheels for flange wear according to the standard "Limit of Wear Gage" is too tolerant in that it allows too great side play. An extreme case which is possible with the use of the gage but is exceptionally rare in practice is, if a pair of wheels with 1⅛-in. flanges were both worn to the limit indicated by the gage or to a thickness of 1⅛ in., this would allow each flange to wear off ½ in., or a total of 1 in., which is too much. Such wear would undoubtedly cause noise, and should be avoided by increasing the thickness of the flange at its condemnation point.

Again, the thickness of the flange is a noise sinner,

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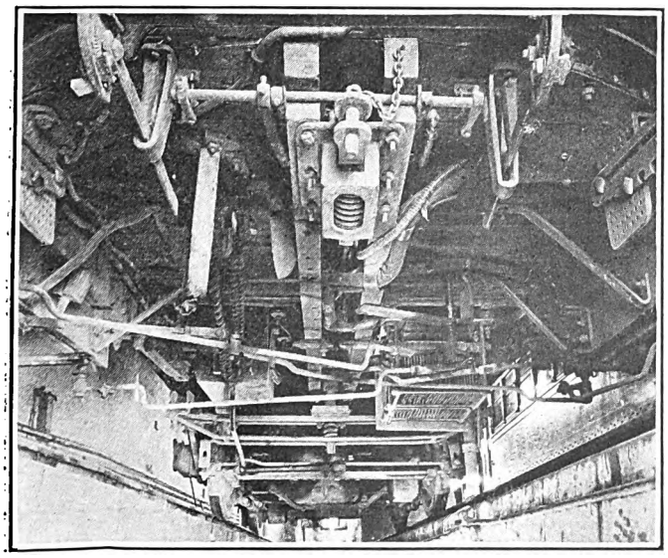
in that it governs the width of slot necessary in special work; so the narrower the initial wheel flange, the narrower the rail groove can be made, and thus the pounding of wheel passing over special work will be less objectionable.

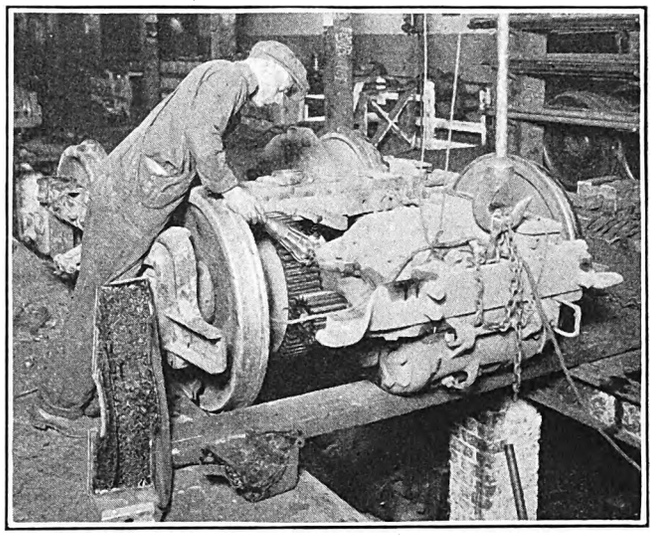
Another phase of noise production by wheels is the ringing, bell-like sound which is set up whenever they are in motion. This is particularly true of steel wheels, and its cure is extremely easy. If the wheels are purchased with four holes drilled through the web, the simple expedient of bolting four pairs of wood, rubber or similar cushioning element blocks to the wheel will effectively kill the ringing sound. This is easily demonstrated in the shop by equipping one wheel as directed, then by striking this wheel a hammer blow and comparing the sound with that produced on another wheel without the silencing pads. Of course, one must not run into the error of thinking that this treatment will kill all wheel noise, for it will not.

The weight of wheel and axle has a bearing on noise, as this is all unsprung weight and, of course, all of the impact sounds due to roughness or imperfections of wheel or track are proportional to the weight. While this might be considered a construction problem rather than maintenance, it is to be noted that wheels and axles are continually being replaced in the routine of maintenance. To cut down this weight it is probable that the Twin City lines of Minneapolis and St. Paul have made the greatest progress, as they have used hollow axles and cut large holes in the web of the wheels.

Motor gearing is another prolific source of noise which can be greatly reduced by proper maintenance. Probably the most important feature of this is to maintain correct gear centers. With gears the proper distance apart, bearings tight in their housings and gear teeth well lubricated the noise due to them will be at its minimum, and will not be objectionable. While this discussion pertains to noise, yet the subject of wear as its component is inescapable, for wear means noise and noise means ultimate destruction. So it is to be noted that the minimum wear takes place when the pitch lines of the two gears coincide. As soon as spreading of centers is allowed, cutting action between the teeth takes place and wear sets in at an accelerated rate. This allows hammer blows between teeth and consequently disagreeable sounds. Spreading of gear centers



The Underbody of Most Cars with Many Joints, Connections and Levers Is a Fertile Place for Sloppy Fits



Careful Attention to Gearing, with Ample Lubrication, Will Do Much to Reduce Noise. The Maximum Amount that Gearing Can Spread Should Be Determined at Each Inspection

is due to worn bearings or housings, or both; so to keep the resultant noise within bounds it will be necessary to fix limits of wear. It is impossible at this writing to prove what the limits should be. As a tentative recommendation I suggest that armature bearings be renewed when worn $\frac{1}{16}$ in., and axle bearings be renewed when worn $\frac{3}{32}$ in. When the bearing becomes loose in its housing it should be replaced, as any looseness means rapid wear and noise.

The customary initial bearing fits are considered too tolerant. Successful operation can be obtained by boring bearings 0.002 in. per inch of diameter larger than the shaft. This applies to axle bearings as well as to armature. Axle bearings should have individual fitting and not be bored to a set of standard sizes. To follow this practice successfully it is necessary that the shafts be trued and kept free from taper. It is also important that the bearings be protected from dust and grit. By paying careful attention to accurate bearing fits much greater life may be expected from them, which will compensate for a reduction in the amount of wear allowed at the condemnation point. It has also proved good practice to make the outside diameter of replacement for axle bearings 0.004 in. oversize to insure tight fitting.

Shimming between bearings and housings is indefensible as a standard practice, as the wear at this point is such as to produce an elliptical form; consequently a shim will not offer uniform support to the bearing. The result is a distorted bearing or a fit that will soon become loose and then—more noise. The best practice is to bore the housing to a standard oversize, or weld it and rebore to the original size.

Gears are also subject to high pitched ringing sounds similar to those previously discussed under the subject of car wheels. This ringing can be muffled in a manner similar to that suggested for wheels, by bolting pads of cushioning material to the web.

Noise emanating from trucks is probably of next importance, and the standard of maintenance has an important bearing on whether these are obnoxious or not. The truck sounds are usually due to loose parts, so the problem here is to set up maintenance practices which will keep the parts tight from one overhaul period to the other. Bolted parts that have a tendency to loosen may be held much better if the bolts are made

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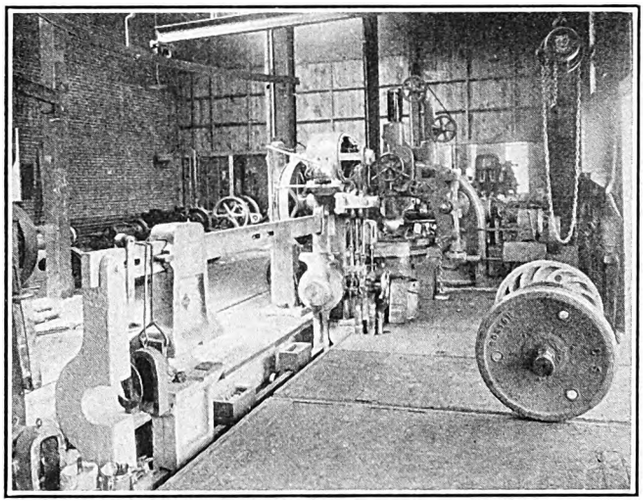


With Wheels Pressed on Accurately and to the Widest Gage Practical, One Source of Noise Is Reduced

of a better grade of material, such, for example, as S.A.E. specification 1035 screw stock, and if a fine thread be used in place of the coarse form. In other cases, if a strip of canvas dipped in a good grade of paint be placed between the parts to be bolted together this will form a cushion that will help reduce transmission of noise and will keep the parts absolutely tight. This method has been most effective where brake heads are bolted to a brake beam, also between gib plates and the pedestal.

Journal box covers are subject to much wear and rattle. On most boxes new covers may be used which may be bolted tightly in place. This will not only cut out their noise but furnish better protection against dirt. On some roads wooden journal box covers have been used successfully.

As mentioned previously, noise is largely due to wear; consequently, if such parts as gib plates, bolster guides, etc., are made of higher grade material or are case-hardened they will wear much longer, and the noisy conditions will be prevented between overhaul periods. Regular and systematic overhaul is absolutely essential in any campaign looking toward noise reduction. In respect to case-hardening, this means hardening by the pack process to insure depth of the hard surface. A thin surface hardening such as cyaniding is not sufficient, although it helps.

Truck noises and vibrations may be transmitted to the body through the medium of the truck springs. Little can be done to prevent this, as the inherent design of the truck is largely responsible. However, if the elliptic springs can be made a little more sensitive some good will be accomplished. This is possible by applying lubricant regularly to the springs. Common car oil can be used, but to secure better penetration it is advisable to cut it with kerosene and swab it on the outside of the spring with a brush or similar tool. Such a practice will also improve the riding qualities of the car. Experiments have been made of wrapping the springs with felt to hold the oil, but the resulting action is no better than the swabbing when consistently followed out.

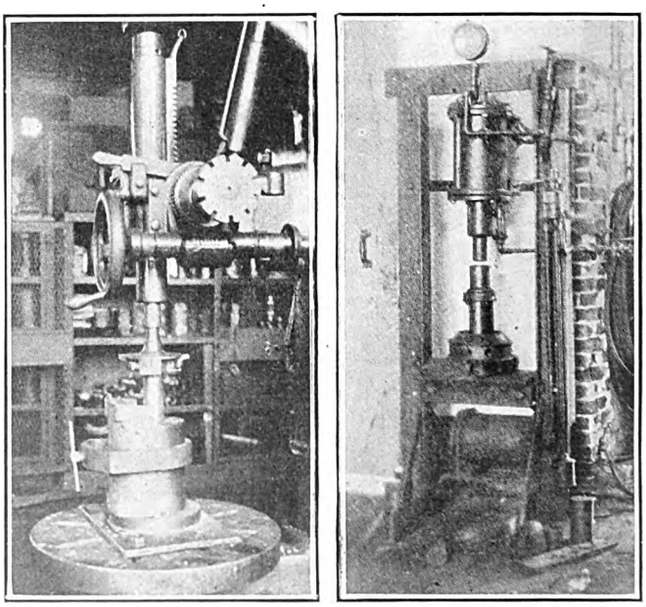
Brakes are not guiltless in the noise inquest. The rigging is never a mechanically perfect job. Sloppy fits are the rule. While this may be justifiable, yet it courts noise. The problem, then, from the maintenance end is how to better existing conditions when overhauling. Hardened pins and bushings should be used, and clearances between pin and bushing should be kept as low as 0.010 in. Clearance between clevis jaws and levers should be taken up by means of flat springs which would prevent rattle. Where long brake rods require support this may be given by allowing them to ride over wooden strips which will thoroughly absorb any noise. Brake shoes are noisy items. While this is a problem of design, rather than maintenance, yet thought should be given to its solution. Shoes have been used successfully which are bolted to a brake beam, thus eliminating the brake head, but their adoption has not spread to any appreciable extent. Surely the present method of attaching brake shoes is entirely unsatisfactory as a noise preventive.

Squealing Brake Shoes Are Annoying

A word might be added as to the composition of brake shoes. This should be so regulated as to prevent squealing. If the shoe is too hard it will be most obnoxious; so a combination of hard and soft metal can be used which will give the life wanted and yet prevent noise.

Of body noises there are many, yet there is little that can be done in the way of maintenance to reduce them except as a car is rebuilt. Perhaps one of the most common sources of body noise as well as a most irritating one to the passenger is loose glass and sash. This can be cured by proper attention. One cause for loose glass is the use of poor putty in setting the glass and using it too freely, with the result that it pulverizes, shakes out and leaves loose glass. Felt or rubber setting is not as susceptible to such trouble. The sounds from track, wheels, trucks, etc., can be minimized by the use of a deadening felt or similar sound-insulating material between the layers of a double floor. Also, the use of a linoleum, rubber tile or equivalent type of semi-soft floor will help muffle these noises.

From the foregoing it is seen that car noise is a complex problem, that no one remedy can be applied to its reduction, but rather the solution of the problem means the study and adoption of higher standards of maintenance and finally keeping everlastingly at it.



Bearings Should Be Bored Accurately, Fitted Individually and Pressed into Housings Carefully in Order to Reduce Noise in Operation

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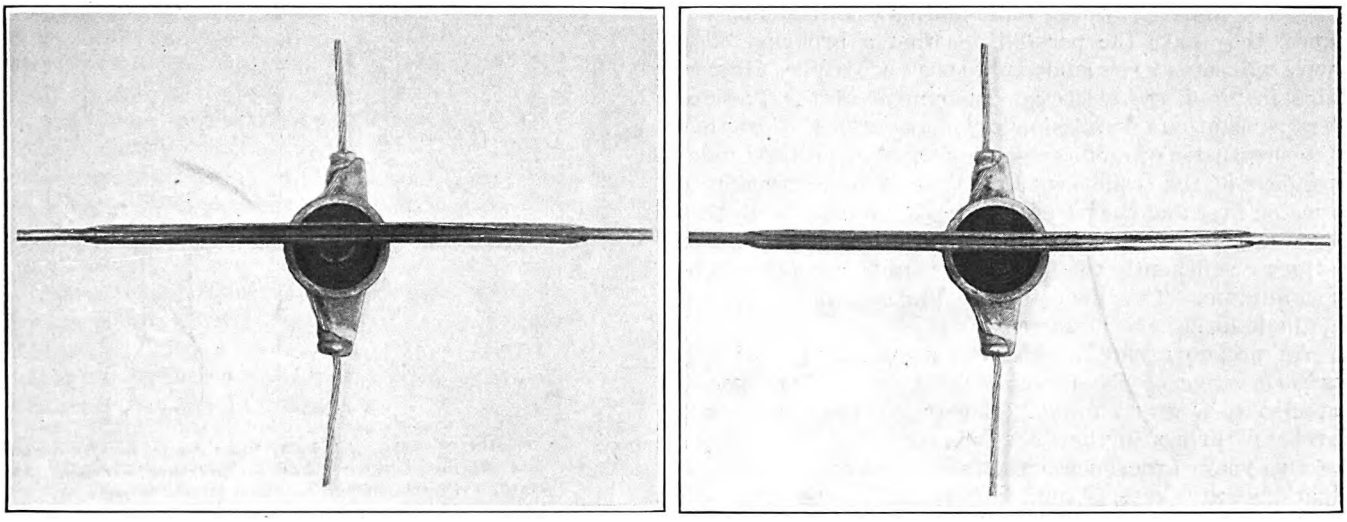


Ears When Applied to Wire, Clamp It for 3 In. at Each End. At Left, Newly Installed Ear. At Right, Ear After Six Months Service

Efficient Trolley Maintenance Helps Sell Rides

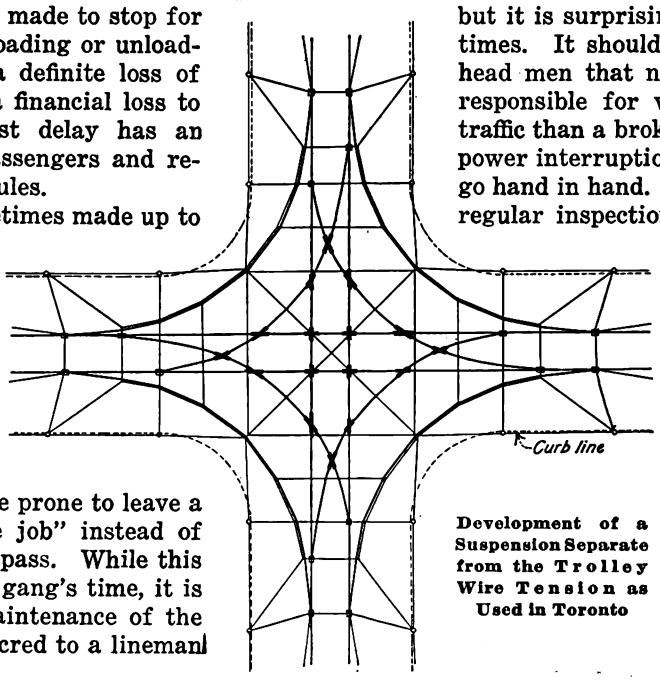
Improved Overhead Construction Maintenance Will Help Materially to Make Electric Car Transportation Popular—Delays to Service Aggravate Passengers—Keeping Cars on Schedule Should Be a Sacred Duty of Linemen

By J. F. Neild
Electrical Engineer Toronto Transportation Commission, Toronto, Canada

CAN an overhead man sell transportation service? Perhaps not; he is not in that end of the business; but it is up to him to help in the production of a service, which the traffic department of the electric railway will find worth selling. How can this be done, and in what particular manner can the line gangs help? It should be impressed upon every line gang foreman; in fact, upon every railway employee, that each time a street car is made to stop for any other purpose than the loading or unloading of passengers there is a definite loss of prestige to the system and a financial loss to the investors. The slightest delay has an irritating effect upon the passengers and results in disturbing the schedules.

The traffic schedule is sometimes made up to operate on a time margin as closely as one-half minute, and it requires the united effort of the whole traffic staff to maintain that schedule against what might be called foreign obstructions, without any associated department contributing a few extra ones. Line foremen are prone to leave a gang at work "to finish the job" instead of pulling out to allow a car to pass. While this way saves a little of the line gang's time, it is wrong in principle. The maintenance of the schedule should be just as sacred to a lineman as it is to a traffic man. Care should also be taken to see that line gangs are not sent to busy sections of the city during hours of congested traffic, for while the crew may not delay a street car directly, it may so obstruct the street as to cause the traffic stream to divert to the car tracks, thus causing delays.

That the work should be so well done as to safeguard against breakdowns one would take for granted, but it is surprising what chances are taken at times. It should be impressed upon all overhead men that no part of the system can be responsible for wider spread disturbance of traffic than a broken trolley wire, unless it be a power interruption, and these twin devils often go hand in hand. All lines should have careful, regular inspection at comparatively short intervals. In Toronto the practice is to cover the entire system every three months; all repairs that are found necessary by the inspecting gang should be made by the gang when found. When repairs are listed for future attention usually a certain percentage are neglected and a breakdown may result.



Development of a Suspension Separate from the Trolley Wire Tension as Used in Toronto

Investigation into many types of intersection construction shows that while

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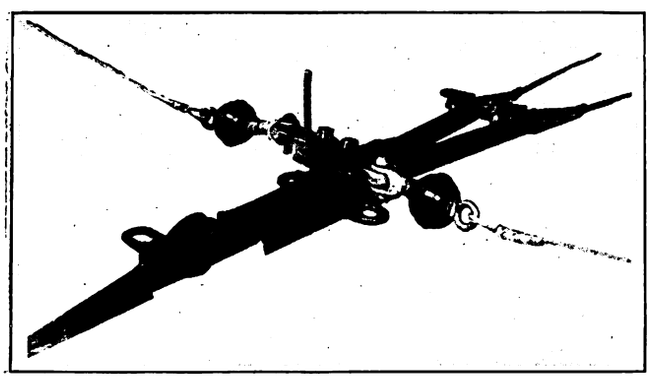
they are apparently well built and have a neat appearance, they have the possibilities that a broken trolley wire will cause a sag sufficient to obstruct traffic. Having this in mind, the electrical department of the Toronto Transportation Commission is working with the idea that the suspension of an intersection should be entirely independent of the trolley wire tension. The suspension is erected first and the wire is run in afterward. With this type of construction, the possibilities of an intersection sagging sufficiently to obstruct car traffic are reduced to a minimum. This also permits the renewal of curves without losing the alignment.

An accompanying illustration shows a plan of the present stage of the evolution of this construction as applied to a grand union. Constructive criticism will probably bring further developments, but the results of two years experience with this construction indicate that the extra cost, if any, is justified, as the main object is not how cheaply curves can be erected, but how securely they can be put up at a reasonable cost. Extreme low cost of construction is not as important as continuity of service.

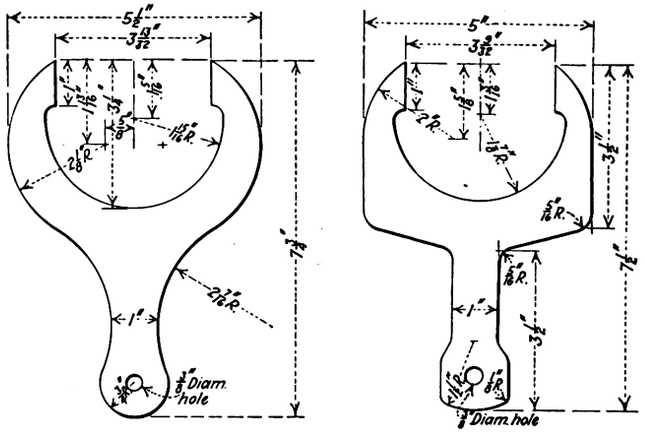
In order to speed up the changing of worn frog



New Type of Frog Suspension Clamp Used by Toronto Transportation Commission

pans, a new type of frog suspension has been developed. This is shown in another illustration. This device is a clamp, which is supported by the span wires and which holds the trolley wires. The frog pan is placed up against the underside of the clamp and is held in place by the cam tips. In order to change a pan, all that is required is to strip off the cam tips, replace the pan and put on new cam tips, a matter of two minutes. This device accurately retains the frog location, which is a very important feature for some locations. After an experience of one year with approximately one hundred installations no weakness has developed in the device.

A close examination of the wear of trolley ears has shown that no matter how careful a man is in putting on the ears ridges are left on the lips of the ear by the hammer. These ridges become worse gradually and are responsible for a great deal of the rumbling in a car when the trolley wheel is passing over an ear. After considerable investigating, we found that by using a 15-in. ear on the tangent line, clamping it on 3 in. at each end and leaving the remainder of the lip as a smooth-running surface, there is a considerable reduction in noise. The continued running of the trolley wheels rolls the ear around the wire, as shown by two accompanying illustrations, one showing a newly installed ear and the other an ear after six months running. At first it was thought that the ear installed in this way would not hold the wire securely, but after

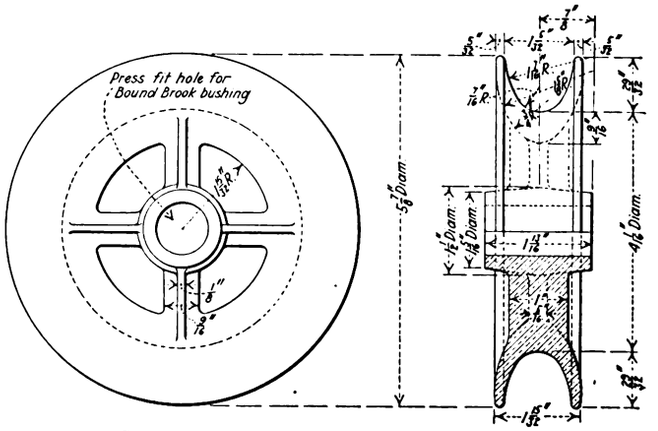


Gages for Trolley Wheels. At Left, Shop Gage for Re-dressed Wheels and Minimum Wear Gage for Further Service. At Right, Inspection Gage to Show When Wheels Should Be Removed

two years experience this thought has been dismissed, as no case of an ear "letting go" has been found, and during 1925 there were only 26 emergency calls for ears on the entire system.

Greasing the trolley wire is another factor which has contributed to quieter operation. The primary object in greasing the wire in Toronto was to prevent the formation of ice, but the results have proved very satisfactory from a regular operating standpoint. A smooth, hard skin appears to form on the wire with greasing, which reduces the rolling friction of the wheel or slider to a minimum and gives a very quiet operation, particularly around curves or loops. From the experience in Toronto, I believe the greasing of the trolley wire is well worth following up.

No matter how much attention is paid to the overhead lines, it can be offset very easily by the failure to maintain the trolley collector, either wheel or slider, with its auxiliary equipment, in first class condition. In Toronto the trolley poles, stands, etc., on cars are inspected every 1,000 miles in the case of some cars and 1,500 miles for others. At this inspection the trolley wheel is examined, and if there is no undue play at the bushing and no flat spots, side grooves or other defects necessitating removal, the wheel is gaged, using special gages for this purpose. There are two of these gages, one of which is also used in the shops as a "minimum allowable diameter" gage for further service of re-dressed wheels. If, when checking on the car, the wheel will not pass through this gage, it is considered fit to run till the next inspection without further attention. The second gage is a scrap limit gage, and all wheels which pass through



Standard Trolley Wheel Used in Toronto

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this are removed from service. If a wheel will pass through the first gage, but not the second, the car number is recorded and the wheel checked at intervals of three or four days. These two gages and details of the wheel are shown in accompanying illustrations.

The trolley wheels used in Toronto are 5⅞ in. diameter and have a "U"-shaped groove. Our experience has proved that this diameter is best suited to our needs and that the "U" groove is more satisfactory than the "V" shape, affording a longer life and more uniform wear. These wheels are fitted with a special bronze bushing with graphite inserts. A ½-in. diameter cold rolled steel axle is used. The average life of a wheel has been found to be 14,000 miles and one wheel will wear out two bushings.

The pressure of the wheel against the wire is checked by means of a 25-lb. weight which the inspector hooks on to the trolley rope. The upward pressure of the springs should balance the pole at any elevation, and, if necessary, the spring pressure is adjusted to obtain this condition. The wheel axle is not oiled, the graphite taking care of the lubrication at this point, but a few drops of oil are put between the contact springs and the wheel.

The rolling stock department, which is responsible for the trolley wheels, and the electrical department, which is responsible for the trolley wire, work together in the closest co-operation and thus smooth out any rough spots in the overhead system.

Can the present transportation sold by electric railways throughout the country be improved by the overhead department? It can and it will be, in many small ways which in themselves may seem trifles, but in the aggregate are important, just as soon as all overhead men, and in fact all street railway men, realize that no matter in what department they are, their business is to carry passengers, not only safely but with a regularity of service that will command attention.

The Electrical Department Can Help Reduce Noise

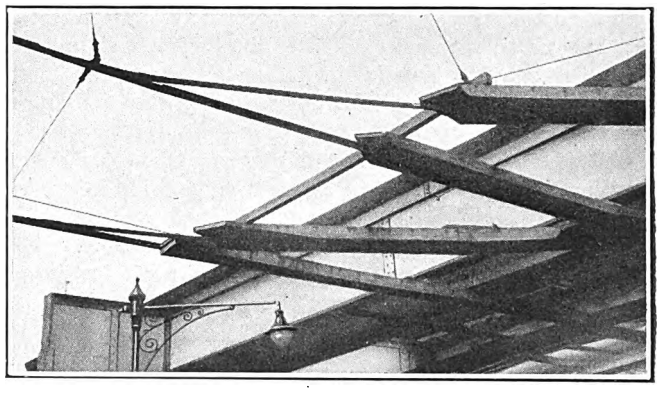
In the Overhead Short, Heavy Ears Cause Pounding—Section Insulators and Frogs Require Long, Smooth Approaches—Bar Construction Is a Particular Offender—Third Rail Approaches Should Be Long

By G. H. McKelway
Engineer of Distribution Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

VERY few men in the line department of electric railways realize that there will be any difference in the amount of travel in electric cars if the amount of noise is reduced. One of the first things necessary to effect a reduction of noise is to sell the fact to the employees that the railway company will be helped if there is less noise and also that at present there is more noise than is necessary. Many of the lesser noises which are not given consideration can be reduced and probably done away with entirely. Many old timers may consider it a joke, but the fact still remains that line departments of electric railways can assist materially in reducing noise in operation through better maintenance and so can help to merchandise electric railway transportation.

The trolley wire itself, especially when supported by span construction, presents a smooth path along which the wheel can run or the shoe can slide with a minimum of noise. There may be trouble at the ears due to pounding, but with a well-designed ear, that gives a smooth under-run, there should be no trouble. Occasionally, however, one finds a home-made design which is short and heavy, with thick lips. This is sure to pound and make noise. The same trouble will be experienced with section insulators or frogs. Much can be done here by carefully designing the approaches and by renewal of the approaches or castings when they begin to wear. Fiber runners of circuit breakers become burned away and these should be replaced in order to give smooth running.

A piece of copper tubing used to protect the wire at frogs and similar locations which becomes broken away



Iron Bar Construction, While Strong and Durable, and of Particular Benefit Where Operation Is Under Bridges or Culverts, Is a Great Producer of Noise

from the rest of the sleeve and is allowed to hang loosely around the wire is another and generally very annoying noise producer. This will rattle when the wheel is passing and also continue to rattle for some time after while the wire is vibrating. The remedy, of course, is to remove the broken piece and make repairs as soon as it is noticed. While such noises are considered very slight when the wire is under span construction, the pounding and consequent noise is increased by more rigid support, as when the hanger is attached to a bracket arm without a short piece of span wire.

When trolley wire is run under a trough construction the noise is much more noticeable, particularly with the most common construction, which consists of attaching the wire directly to the trough by means of barn hang-

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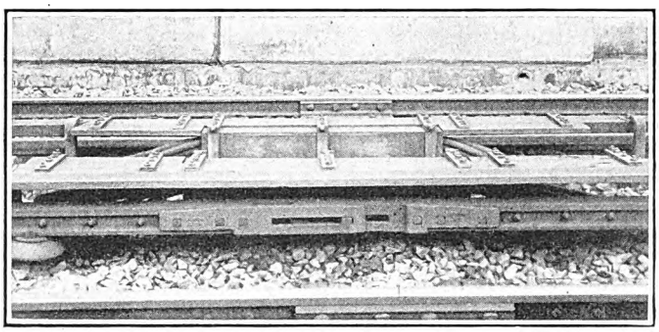
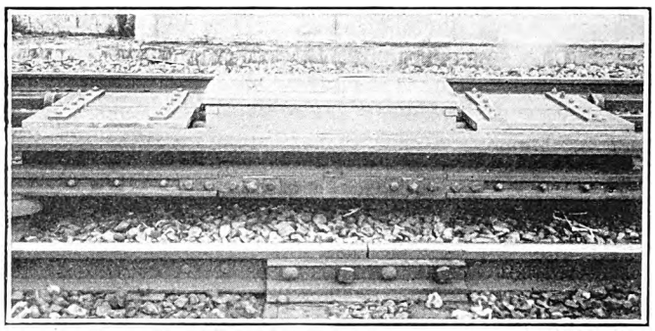


Instead of Allowing a Gap in the Third Rail for Expansion and Contraction, Expansion Joints May Be Used Which Will Not Lift the Shoe and Will Produce Quiet Operation



A Type of Construction Used at Feeder Sections Which Eliminates Gaps Consists of an Insulated Joint Between the Ends of the Third Rail

ers. Not only is the pounding increased with this construction but the trough acts as a sounding board to throw the sound down and outward, where it can be heard more readily. On very hot days the trolley wire will sometimes expand to such an extent that there will be considerable slack between the ears and so cause considerable pounding. This may be so bad that even the flanges of trolley wheels will strike the bottom board of the trough. This condition occurs much more frequently with trolley hangers spaced far apart than with deep ones set close together.

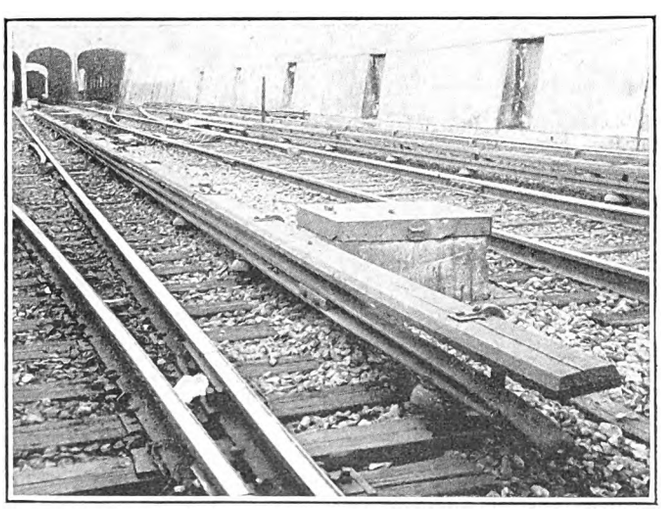
The worst noisemaker among all kinds of overhead construction is the iron bar. This is a pity, for there is no stronger and more durable construction than this. Attempts have been made to lessen the noise by using copper instead of iron bars. This makes a quieter but weaker and a much more costly type of construction. On account of its great strength and freedom from breaking, iron bar construction would be used much more under trough were it not for the noise made by cars when operating under it. Possibly in time some method of spring suspension may be worked out which will admit of this type of construction being used without the noise which is now considered so detrimental. Now the construction is limited generally to that over special trackwork or where operation is under bridges, culverts or elevated construction or into carhouses.

All of the noise that is blamed on the distribution system is not confined to those roads using overhead trolleys. Operation of third rail collectors used by many interurban roads often produces more noise than trolley wire collectors. This is very annoying, not only to persons riding in the cars, but to those living near the lines as well. One of the greatest troubles is due to shoes leaving the rail and then striking it again with a bang; also when operating across gaps with power on there is flashing from opening the circuit and considerable noise. The obvious remedy is to keep shoes in contact with the rail as much as possible. This can be done on unbroken sections by keeping the ends of abutting rails together and in line, so as to prevent pounding and arcing at these points.

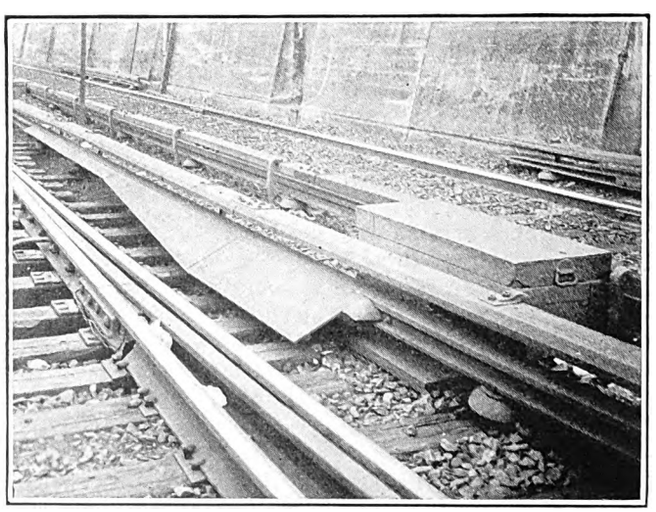
The worst places for noise are at the end approaches or nosings, as they are frequently termed. One way of reducing noise at these points is to eliminate as many of these as possible. Some of these are necessary, however, and where used, noise can be reduced to a great degree by careful design so that long, easy approaches are provided.

These approaches often are installed at intervals of 1,000 ft., so as to allow for the expansion and contraction of the rails due to changes in temperature. This method of construction, however, is unnecessary, as the same results usually can be obtained through the use of expansion joints which will not lift the shoe from the rail and therefore will cause quiet operation. An accompanying illustration shows a type of construction which is proving satisfactory.

Another point where nosings were once used but where their use has now been decreased considerably is at the ends of feeder sections where gaps were formerly left in the third rail so as to separate the sections from each other. Now it is considered better practice, especially where only a short break is required, to use an insulated joint between the ends of the rails or a section of rail with insulated joints at both ends.



Noise Can Be Reduced Where Third Rail Is Broken by Having These Long Approaches



At Crossovers Where Side Approaches Are Used Sharp Angles of Contact Should Be Avoided

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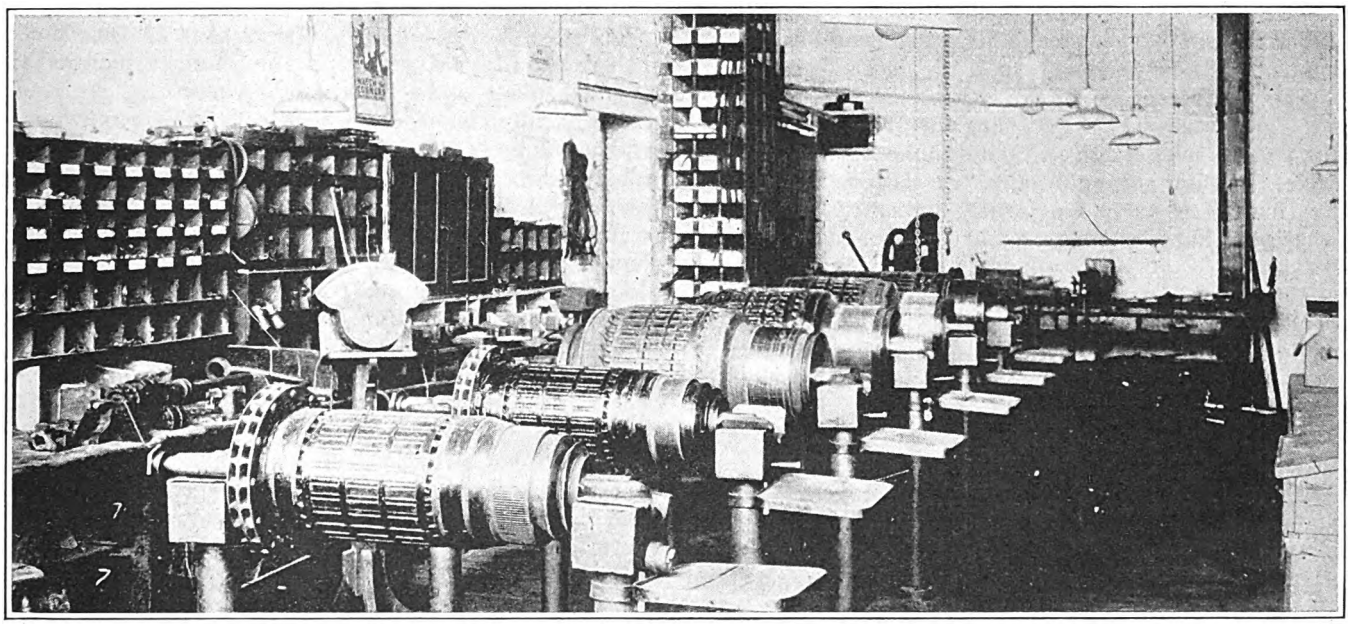
Reliable Rolling Stock Must Have Well-Directed Maintenance

Continuous, Uninterrupted Operation of Cars Requires Constant Attention to Electrical Equipment—Defects Should Be Prevented Rather than Remedied—Careful Adjustments and Tests Are Necessary to Keep Equipment in Its Highest State of Usefulness

By C. R. McMahon
Superintendent of Equipment Des Moines City Railway, Des Moines, Iowa



Armatures Are Supported on Stands During Repairs. The Meter Used for Testing Can Be Attached to Any Stand

PROPER maintenance of the electrical car equipment of any railway requires much more than ability to make repairs skillfully and quickly. The aim of men in the maintenance organization should be to prevent troubles rather than to remedy them; to prevent accidents, shock or irritation to passengers from improper operation of the equipment rather than to locate trouble after the damage is done; to furnish better and more attractive service by reducing detentions caused by equipment failures, and to bring the equipment to its highest efficiency. The maintenance department must co-operate with the stores department to keep essential renewal parts on hand and to keep the stock of repair parts as small as possible. It must co-operate with the track department by keeping wheels to gage, trucks free and true and sharp wheel flanges off the road and with the line department by not allowing trolley wheels to become worn excessively, by keeping trolley bases well lubricated and the tension just right. The management of the road must be kept informed as to costs of maintenance and the need for new and better equipment. All this requires a knowledge of operating conditions, a well-balanced organization and a definite program for careful and systematic inspection.

In Des Moines we have found that by having a careful record system and by studying the results we can look into the future and see where improvements will produce still better results and reduce failures. We keep a careful record of the number of gears and pinions used and the number of armature, axle and journal bearings used by types and divided between new and reconditioned material. Records of gear cases, trolley equipment, air compressors, compressor armatures and fields, railway motor armatures and fields, armature coils and other like equipment give a comparison by types as well as a record of their service. Detail records of car failures from electrical causes are classified into the different pieces of apparatus and are kept separate for city and interurban service. Such records give information for reducing the number of car defects, for reducing overtime due to fewer breakdowns on the road and for keeping maintenance costs down. The improved equipment creates better public relations and furnishes better service.

Some of these records are shown in the accompanying tables. Those for new gears and pinions used as indicated by storeroom requisitions are tabulated for the past eight years and are listed by the various types of motors that are in service. The reduction in the number of armature bearings, axle bearings and axle collars used indicates how effective our system of lubrication has been. We endeavor to keep our oiling cost as low as possible, but we believe that oil is cheaper than bearings, gearing and armature repairs. Our oil cost

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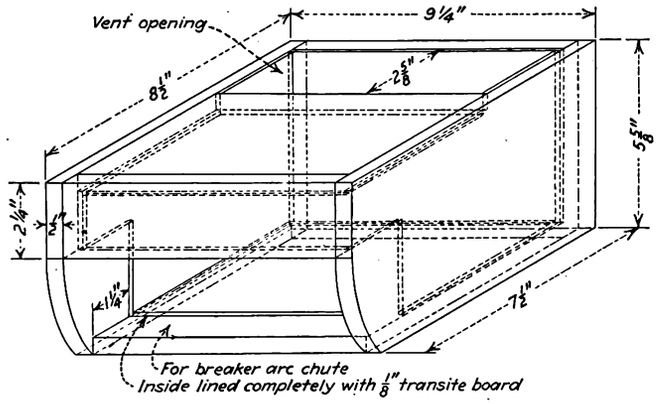


Box Construction to Shield Circuit Breaker Arcing

for the past three years has averaged about 25 cents per 1,000 car-miles. This includes all oil for armature and axle bearings, journals, air compressors and gears, but not for new packing waste.

The number of new gear cases used was reduced to two for the year 1924 and none for 1925. Requisitions for trolley poles, slides and shoes are shown in another table. The low consumption of wheels for 1919 is due to the fact that we had a large number of second-hand wheels on hand which were turned up and returned to service.

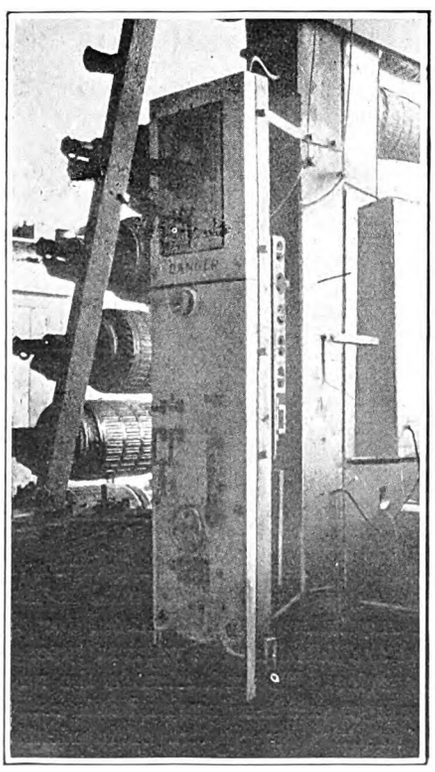
Maintenance records and costs must necessarily depend to a large extent on service conditions and the equipment operated. In order that those unfamiliar with the Des Moines property may get a birdseye view of our service and equipment a summary of equipment and yearly mileage for city and interurban cars is given in two tables.

The equipment operated by the Des Moines City Railway and the Des Moines & Central Iowa Railroad consists of 156 city passenger cars, ten interurban passenger cars, eight electric locomotives, two express cars, eleven work, line and service cars and ten miscellaneous snow plows and sweepers. The motor equipment is shown in Table I.

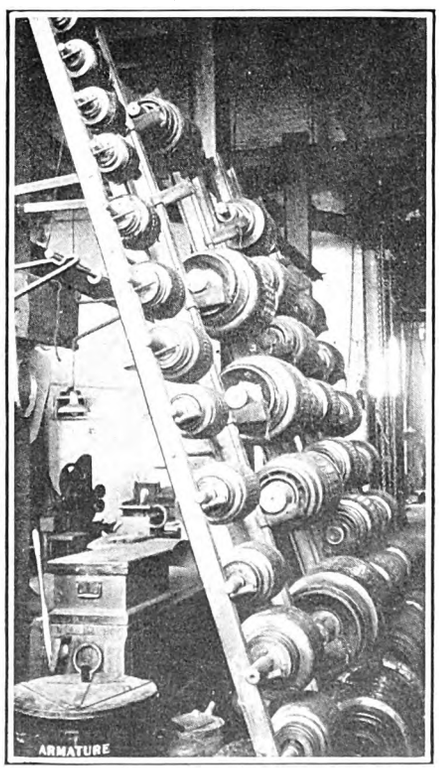
On account of service conditions, 95 city passenger cars which originally had G.E. 57, 67 and 258 motors were replaced with four G.E. 247-I motors during the years 1922 and 1923. In addition, ten new cars with G.E. 247-I motors were purchased early in 1924. Service conditions in the city of Des Moines are rather severe for a city of its size. This is due particularly to the small area covered by the business district, which necessarily causes much congestion and results in delays to operation through the loop section. There are also numerous grades in the city, some of which are quite severe. The total residence district for the city covers an area of approximately 54 square miles. Weather conditions result in a wide variation in temperature, varying from 100 deg. F. in the summer to 20 deg. below zero in the winter. The rainfall in Des Moines is often quite heavy during the summer months and there is much snow in winter. Therefore, our equipment is called upon to meet quite variable conditions.

The repair facilities of the railway consist of one main shop, where all heavy repairs, such as changing armatures and wheels and repairing cars damaged in collisions, are taken care of, together with general overhauling and painting. In addition there are two city operating carhouses and one interurban operating carhouse, where inspection, oiling, light repairs and car washing are done.

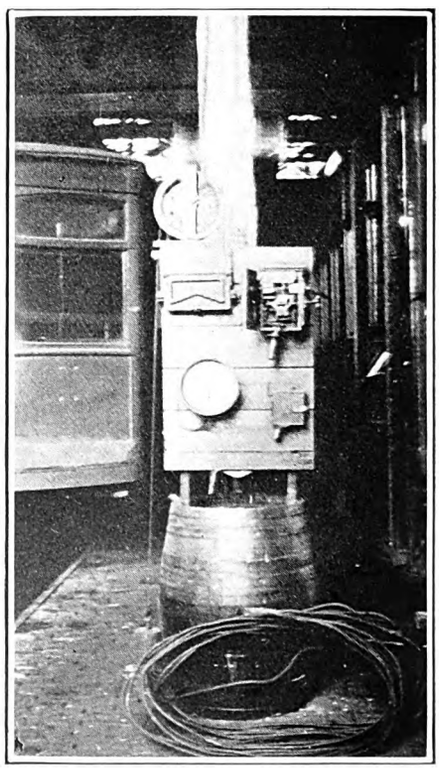
All cars are inspected on a 1,000-mile basis at the operating carhouses. Trolley wheels are examined for wear and arcing, but are not oiled, as we use an oilless wheel. Poles are checked for bends and alignment, bases for easy action and tightness of trolley cables, and car roofs are checked for leaking. All car seats, destination signs, window glass, guards, grab handles, fare registers, steps, doors and other car body parts



Instrument Panelboard to Make Various Tests of Electrical Equipment



Repaired Armatures Ready for Service Are Stored in a Large Rack



Circuit Breaker Testing Outfit Located at a Central Point in the Car Shops

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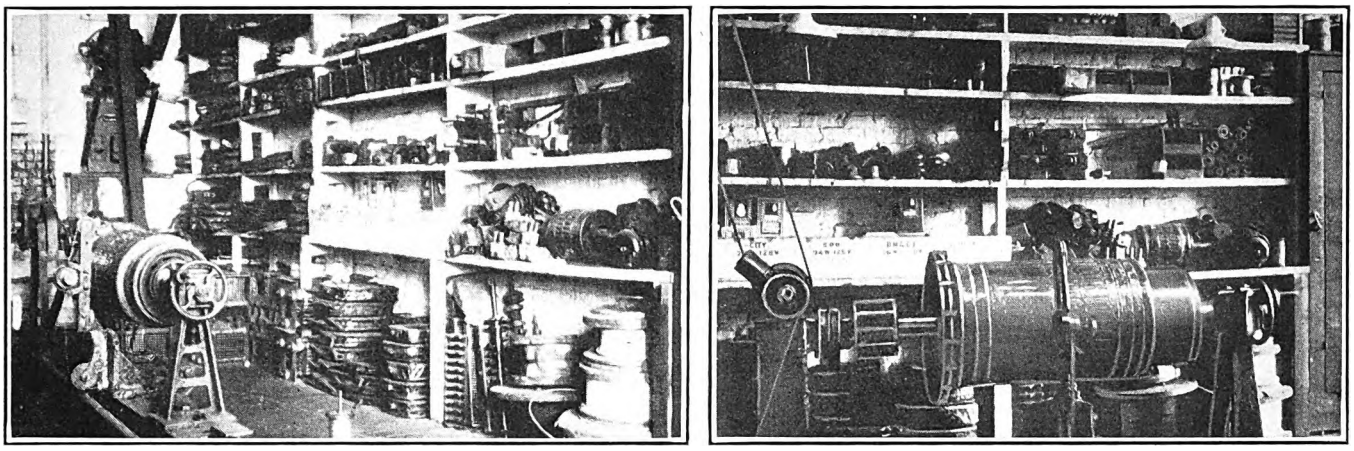


At Left, Repaired Material Is Stored Conveniently to Be Put Back Into Service. At Right, Armature in Position Ready for Banding
The lathe in the foreground at the left is for banding armatures, and a coil winding lathe is in the rear.

are examined thoroughly and any light repairs needed are made.

Controllers are examined carefully for worn fingers and segments. Cable connections are examined and all working parts are lubricated. Circuit breakers and line switches are looked over and repairs are made if needed. All air brake equipment is inspected, valves are oiled, governor contacts and their action are checked, compressor motors are examined, brushes are renewed if needed, brush-holders and field connections are inspected, the oil level is checked and any air leaks in the piping are repaired. All motor leads, cables and resistors are examined and repairs are made if needed. Motor brushes, commutators, armature clearance and the general condition of the motors are examined, both from the top cover plate and bottom inspection plate.

Trucks, wheels, brakes, fenders, sanders, drawbars and all parts underneath the car are gone over thoroughly. All armature and axle bearings are oiled on the same 1,000-mile basis. The car journals and gears are lubricated on a 4,000-mile basis.

At overhauling periods air governors are removed from cars and are thoroughly inspected. Worn parts are replaced and tested for adjustment and air compressors are removed, armatures taken out, cleaned, tested, painted and commutators are turned. Compressor bearings are adjusted, pistons and rings are examined and renewed if necessary and gearing is inspected for wear. The compressor is then reassembled and tested for quietness and efficiency.

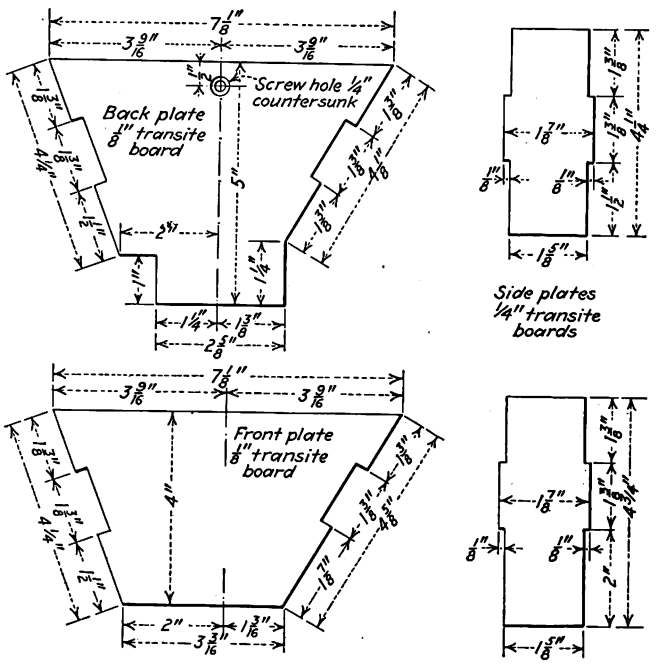
Cars are overhauled and are painted on a 100,000-mile basis, or approximately every two years, at which time everything is thoroughly inspected and repaired from the trolley wheel to the wheels underneath the car, and all parts are put in as nearly new condition as possible. The car is then taken to the paint shop and is thoroughly cleaned, varnished inside and enameled outside with a coat of varnish over the enamel, which is allowed to dry seven days before the car is returned to service.

The beneficial results of more rigid inspection are shown in the tabulation of car failures from electrical causes, as shown in Table IX, which is for the past seven years. Reduction in armature, brush-holder and field failures for the past three years is due partly to the purchase of some new motor equipment, but the reduction of other electrical failures is due to more rigid inspection.

The types and number of air compressors which we have in service are shown in Table XII and the number of air compressor armatures in the shop yearly for rewinding and repairs is shown in Table XIII. Table XIV gives the fields for air compressors which are repaired yearly. These are divided into the various types of compressors which are in service. New field coils for traction motors drawn from the storeroom yearly are shown in Table XV and those repaired in Table XVI. Table XVII gives the sets of armature coils used and Table XVIII the number of armatures except rewinds which are in the shops for repairs yearly. The repair list of armatures also includes those which were in the shops only for testing and painting without additional repairs being made.

Some of the improvements which have been made and methods which have been adopted have resulted in a material reduction of troubles which can be classed as annoying to passengers or producing conditions which detract from the service. At one time we had many circuit breaker failures caused by the arc gradually burning a hole in the inside between the contact tips and the arc chute. This has been eliminated by lining the chute with transite. An accompanying illustration shows the construction used for the MR 12-D circuit breaker. Whenever holes burn in the transite it is now replaced by new pieces which are kept to standard size.

We have been very successful in eliminating the noise



Arc Chute Linings Used with MR 12-D Circuit Breaker

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TABLE I—SUMMARY OF MOTOR EQUIPMENT, DES MOINES CITY RAILWAY

Number of Cars	Weight, Lb.	Service	Type Motors	Total Motors	When New
38	38,000	City	G.E. 98	76	1912
49	36,000	City	G.E. 258	196	1916
39	38,000	City	G.E. 57	78	1904
20	38,000	City	G.E. 67	40	1904
10	38,000	City	G.E. 247-I	40	1924
10	75,000	Interurban	G.E. 73	40	1904
11	60,000	Work	G.E. 210	42	1912
2	60,000	Express	G.E. 73	8	1914
1	60,000	Engine	G.E. 73	4	1910
2	80,000	Engine	G.E. 207	8	1914
1	75,000	Engine	West. 303	4	1913
1	111,000	Engine	G.E. 212	4	1917
1	130,000	Engine	West. 567	4	1918
2	120,000	Engine	West. 567	8	1916
10	Snow Equipment		G.E. 57–67	30	1906
197				582	

TABLE II—YEARLY CAR-MILES OPERATED

Year	Total Car-Miles Operated: City	Interurban
1919	4,623,932	672,472
1920	4,207,563	708,400
1921	4,051,150	583,014
1922	5,647,020	572,745
1923	5,574,185	583,717
1924	5,598,214	566,822
1925	5,531,734	549,186

TABLE III—AVERAGE TIME TO REWIND ARMATURE

Type	Hours: Minimum	Maximum	Average
D1	18	31½	25½
D2	19½	27	23½
D3	26	29½	28
D4	28	44	38½
A4	15½	29½	21½
25	21½	30½	26
27	24½	24½	24½
130	44½	44½	44½
67	22	41½	27½
57	23	47½	31½
73	30	70½	40½
98	26	38½	32½
207	40	47	44
210	31	42½	36
212	50½	100	69
247	30	36	31½
258	16	30½	21
303	35½	44	40
567	81	83½	82

TABLE IV NEW GEARS USED YEARLY

Type Motor	1918	1919	1920	1921	1922	1923	1924	1925
57	4	10	0	3	0	0	0	0
67	2	5	0	0	0	0	0	0
73	3	1	0	0	0	4	0	0
98	5	5	1	0	1	15	2	1
207	4	4	0	0	0	0	0	0
210	0	0	0	0	0	0	2	0
212	0	0	0	0	0	1	0	0
247	..	..	..	..	0	0	18	0
258	8	4	1	9	0	..	..	..
303	0	2	0	2	0	0	0	0
567	2	0	0	0	0	0	0	0
	28	31	2	14	1	20	22	1

TABLE V NEW PINIONS USED YEARLY

Type Motor	1918	1919	1920	1921	1922	1923	1924	1925
57	16	34	6	22	24	3	0	0
67	6	5	3	0	0	1	0	0
73	6	6	0	2	0	0	0	1
98	29	11	10	19	18	16	9	8
207	6	4	0	0	1	0	2	0
210	0	0	0	2	0	0	0	0
212	0	0	0	2	0	0	1	0
247	..	..	..	..	1	0	3	0
258	31	90	49	61	63	..	..	..
303	2	0	1	1	0	0	0	0
567	0	0	0	0	0	0	1	1
	96	150	69	109	107	20	16	10

TABLE VI NEW ARMATURE BEARINGS USED YEARLY

Type Motor	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
57	13	35	5	10	18	12	17	26	6	0	0
67	15	11	8	81	37	4	12	0	0	0	0
73	1	3	6	3	13	5	4	4	2	2	10
98	0	6	6	7	7	6	7	0	0	0	4
207	0	2	0	4	0	0	3	2	0	1	0
210	..	..	..	..	..	..	..	..	2	4	3
212	0	0	0	0	1	2	0	2	2	1	1
247	..	..	..	..	..	..	..	..	..	5	13
258	36	52	93	75	149	..	..	..	..	..	..
303	0	0	0	0	2	0	1	0	0	0	0
567	0	0	0	0	0	2	0	0	1	0	0
	65	107	119	180	226	29	44	34	13	13	31

TABLE VII NEW AXLE BEARINGS USED YEARLY

Type Motor	1918	1919	1920	1921	1922	1923	1924	1925
57	89	42	15	14	34	4	4	0
67	117	27	10	0	3	0	0	0
73	72	33	19	37	40	49	27	29
98	13	4	21	17	9	5	4	11
207	0	1	6	0	0	1	2	2
210	0	1	7	0	7	3	0	0
212	0	0	2	2	2	0	2	0
247	..	..	..	..	..	0	50	120
258	36	52	93	75	149	..	..	..
303	0	0	0	0	2	0	2	2
567	0	0	2	0	0	0	3	2
	327	160	175	145	246	112	164	118

TABLE VIII NEW GEAR CASES USED YEARLY

Type Motor	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
57	22	11	22	12	16	15	21	22	7	0	0
67	0	0	0	3	9	0	3	3	0	0	0
73	1	2	0	2	2	0	0	0	2	2	0
98	0	0	0	0	0	0	0	0	0	0	0
207	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0
212	..	..	..	0	0	0	0	0	0	0	0
247	..	..	..	..	..	..	..	..	..	0	0
258	..	0	2	5	8	36	37	27	0	0	0
303	0	0	0	0	0	0	0	0	0	0	0
567	0	0	0	0	2	0	0	0	0	0	0
	23	13	24	22	37	51	61	52	9	2	0

TABLE IX—CAR FAILURES FROM ELECTRICAL CAUSES

	City Division: 1919	1920	1921	1922	1923	1924	1925	Interurban Division: 1919	1920	1921	1922	1923	1924	1925
Trolleys	104	58	35	64	34	22	9	0	2	1	3	0	1	0
Circuit breakers	76	12	8	9	1	9	2	0	0	0	0	0	0	0
Controllers	166	57	63	72	48	11	21	11	4	6	13	5	6	8
Cables	15	13	6	7	9	8	19	1	1	0	2	2	1	1
Resistance	46	29	28	31	24	17	11	2	4	1	3	1	1	1
Motor leads	92	91	98	111	31	28	23	3	2	4	1	1	0	2
Armatures	259	155	133	241	74	6	2	9	17	8	11	10	2	3
Motors flashover	61	106	50	67	56	27	19	0	1	0	1	0	0	1
Fields	71	110	81	60	46	8	4	4	7	4	13	2	3	0
Brush-holders	78	81	59	53	30	42	0	2	14	5	11	3	1	0
Lights	81	47	19	35	14	14	7	0	0	0	2	2	0	1
Totals	1,049	759	580	750	367	192	117	32	52	29	60	26	15	17

TABLE X—NEW AXLE COLLARS USED YEARLY

Type Motor	1918	1919	1920	1921	1922	1923	1924	1925
67	0	3	0	0	4	0	3	0
247	..	..	..	..	0	0	64	0
258	41	20	26	13	11	..	..	..

TABLE XI—NEW TROLLEY EQUIPMENT USED YEARLY

	1918	1919	1920	1921	1922	1923	1924	1925
Poles	168	135	76	94	115	152	192	90
Slides	0	30	13	30	28	81	96	112
Wheels	1,798	513	949	806	755	1,005	861	800

TABLE XII—NUMBER OF AIR COMPRESSORS IN SERVICE

Type	Number	Service
A4	100	City passenger
D1	6	Section speeders
D2	12	Interurban passenger
D3	6	Express, work
D4N	6	Engines
D4K	2	Engines
CP25	50	City passenger
CP27	20	City passenger
CP28	12	Work
CP30	4	Engines
CP130	4	Engines
Total	222	

TABLE XIII—AIR COMPRESSOR ARMATURES IN SHOP YEARLY

1922: Rewind	Repair	1923: Rewind	Repair	1924: Rewind	Repair	1925: Rewind	Repair
12	35	13	74	7	49	3	49
1	1	2	8	1	2	0	0
2	8	4	8	4	6	0	8
1	1	2	3	0	2	0	4
0	4	2	5	2	3	0	7
0	0	1	1	0	0	0	1
0	10	2	19	1	19	2	38
0	0	1	3	0	7	0	0
0	2	0	2	0	1	0	0
0	1	0	0	0	0	0	0
0	1	3	1	1	0	0	0
16	63	30	124	16	89	5	111

TABLE XIV—AIR COMPRESSOR FIELDS IN SHOP YEARLY

1922	1923	1924	1925
3	9	6	2
0	4	0	0
9	1	3	3
0	0	3	0
0	0	0	0
0	0	0	0
0	2	0	14
0	0	0	2
0	0	0	0
0	0	0	0
0	0	0	0
12	16	12	21

TABLE XV—NEW TRACTION MOTOR FIELD COILS USED YEARLY

Type Motor	1915	1916	1917	1918	1919	1920	1921	1922	1923	1925	1924
57	12	10	3	6	5	0	0	0	0	0	0
67	30	28	16	41	51	26	28	33	0	0	0
73	6	8	8	9	1	1	0	0	0	0	0
98	4	0	0	4	3	0	0	2	1	2	0
207	0	0	0	0	0	0	0	0	0	0	0
210	3	0	0	1	0	4	0	0	0	0	0
212	0	0	0	0	0	0	0	0	0	0	0
247	..	..	..	..	..	..	..	..	0	9	0
258	0	0	7	13	20	44	0	44	0	0	0
303	0	0	0	0	0	0	0	0	0	0	0
567	0	0	0	0	12	9	0	0	0	0	0
	55	46	34	74	92	84	28	79	1	11	0

Note.—G.E.-247-I motors were installed during 1922–23. All G.E.-258 and part of G.E.-57 and G.E.-67 retired.

TABLE XVI—TRACTION MOTOR FIELDS IN SHOP YEARLY FOR REPAIRS

Type Motor	1922	1923	1924	1925
57	78	71	11	4
67	73	14	1	0
73	22	20	22	14
98	33	29	11	14
207	0	0	0	0
210	5	0	2	0
212	4	8	0	0
247	...	...	9	0
258	258	2	0	0
303	0	0	1	0
567	0	23	2	1
	473	167	59	33

Note.—G.E.-247-I motors were installed in 1922–23. All G.E.-258 and most of G.E.-57 and G.E.-67 retired.

TABLE XVII—SETS ARMATURE COILS USED YEARLY ON TRACTION MOTORS

Type Motor	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
57	30	20	21	29	16	21	20	3	0	0
67	36	27	39	41	19	23	26	4	0	0
73	7	9	12	5	4	8	7	11	3	4
98	1	9	12	5	4	8	18	20	6	3
207	5	0	0	0	4	0	2	1	1	0
210	2	2	7	6	4	4	6	3	1	0
212	0	0	0	2	3	0	0	4	0	0
247	..	..	..	..	..	..	0	2	7	2
258	2	9	22	38	77	88	120	0	0	0
303	2	7	3	1	0	1	1	0	0	0
567	0	0	0	2	1	0	0	1	0	0
	85	83	116	129	132	153	200	49	18	9

Note.—G.E.-247-I motors installed during 1922–23. All 258 and most of 57 and 67 retired. High number sets of coils used by one particular type above on account motor being too small for the particular service we were using it in.

TABLE XVIII—TRACTION MOTOR ARMATURES IN SHOP YEARLY FOR REPAIRS EXCEPT REWINDS

Type Motor	1922	1923	1924	1925
57	117	68	19	3
67	70	29	0	1
73	39	45	24	40
98	60	78	40	31
207	8	5	5	4
210	14	23	12	14
212	8	1	4	5
247	0	9	71	295
258	242	38	0	0
303	6	0	2	4
567	6	13	16	12
	570	309	193	409

Note.—G.E.-247-I motors installed during 1922–23. All 258 and most of 56 and 67 retired.

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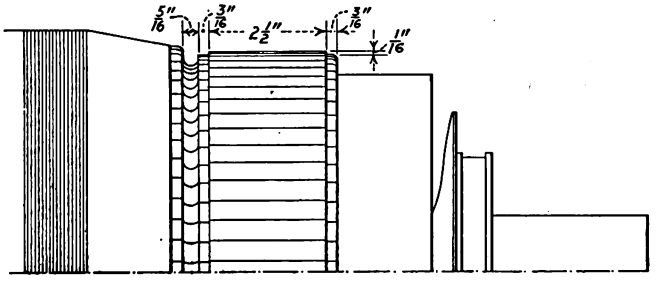
and flashing caused by circuit breakers on account of grounds or excessively fast feeding of the control. Another illustration shows the construction which we have used for placing a box over the arc chute of circuit breakers. When this construction was first installed we rather expected some circuit breaker trouble on account of the choking effect that might result on the arc, but we have had no failures from that cause. The elimination of the flash and danger from the car has been very pleasing to our claim department. While this box construction takes care of the arc from breakers which are located inside the car, it is our experience that the line switch or circuit breaker located underneath the car is much to be preferred, particularly on account of its operating more accurately on overload, and as a result of the circuit being broken underneath the car and not in the controller less trouble is experienced at the controller from burning of the contacts.

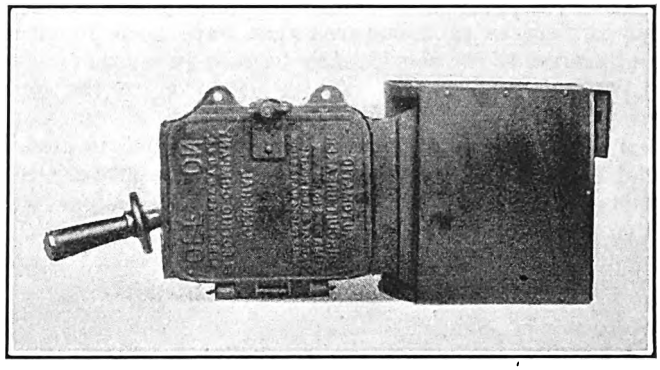
We also take particular precautions to make certain that circuit breakers work properly and that they will open the circuit uniformly at their maximum overload setting. All circuit breakers are tested at overhauling periods and at other times when we have cause to suspect that they may be out of adjustment. Our circuit breaker testing outfits consist of a water rheostat and ammeter, breaker bracket, main switch and fuse, all mounted on a panelboard. The water rheostat consists of a barrel partly filled with salt water. A movable plate moving up and down in the water forms one electrode, while the lower plate, fastened to the bottom of the barrel, forms the other electrode. A pulley at the top is fastened on a cross beam with a rope which connects the ballast weight with the movable plate, which is thus balanced so as to stay in any position where it is stopped. The panelboard is fastened on two timbers which extend into the barrel and act as guides for the movable plate. A long cable is also provided of sufficient length to reach to any car in the shop and tests the circuit breaker in position without removing it from the car. An accompanying illustration shows the circuit breaker testing outfit as located at a central point in the shop. The switch and breaker bracket on the panelboard is used to test repaired breakers before they are sent out to the carhouse as extras.



Commutators Are Turned Down 1/16 In. at the Ends so that the Contact Surface Is the Exact Width of the Brushes

Another piece of electrical testing equipment which has resulted in material reduction of detentions in service caused by electrical failures is a panel with instruments for making various tests of electrical equipment. This panel has connections for both a.c. and d.c. current, and its construction is shown in another illustration. The circuit breaker at the top of the panel is connected directly to the positive feeder. The circuit then passes to the main single pole switch through the main resistance, which is variable, and then to a double socket used for small current tests. There is also a larger double socket which is used for heavy currents. The circuit is grounded on the other side of the sockets so that a plug with two wires can be used to reach to any part of the shop for making tests.

In the illustration six double sockets will be seen distributed along the right side of the panel. The top one of these is connected to the ground return of a single lamp circuit and is used for ordinary ground tests. The second one has three circuits, which are



Circuit Breaker Type G.E. MR 12-D with Box Attached to Shield Arcing

used for testing various lamps. The third is the double socket just referred to, which is used for currents of small value, and the fourth is for testing headlights and also for heating small armatures in the electric oven. This is controlled by the round switch just under the breaker, which has a resistance located behind the panel. The fifth socket is provided with 110-volt a.c. and is used for field testing and for connection to a high-voltage transformer. It is controlled by the double-pole switch on the front of the panel. The sixth socket is for providing heavy d.c. current used to test motors and where heavy current is needed. The square switch and resistance near the bottom of the panel is used for testing Peter Smith stove motors.

As an additional means of reducing failures in service and annoyance from wrong operation of electrical equipment we follow the new features which are brought out and incorporated in late types of equipment, with the idea that some of these constructions may be used to advantage while repairing equipment so as to bring it to a higher state of usefulness. An example of this is the armature coils used with our G.E. 212-B armatures. We now use a one-piece coil with a removable back head. These are purchased from the General Electric Company. With the old type of construction we had considerable trouble due to open circuits and burnouts. These were caused by the two-piece coil becoming unsoldered at junction points. The use of the one-piece coil has entirely eliminated this trouble.

We also rewind National A-4 compressor armatures somewhat differently than they were originally wound and find that better results are secured. Instead of laying the first leads as the coils are put in, we bring these up between the coils and then put them in the commutator after all coils are in place. With this type of construction there are no loose leads to vibrate and break off.

Some of the accompanying illustrations show views in our armature repair department. The stands used for supporting armatures while being repaired or rewound have a shelf at one end for holding various tools and material used in the rewinding operation.

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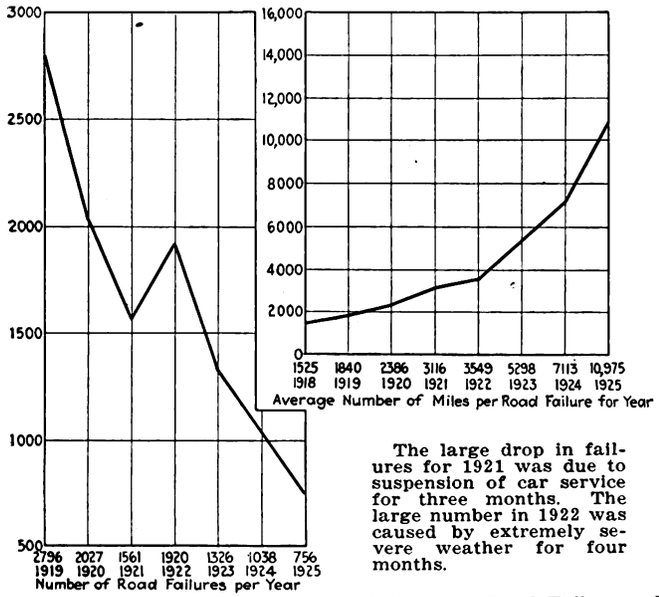
The large millivoltmeter on a pedestal which can be seen in the view for these armature racks is for testing bar to bar of commutators. This is so arranged that it can be moved from one rack to another to be convenient for the test. All armatures which come into the shop for any cause are cleaned, tested and given a coat of varnish and the commutators are turned if necessary. Other views in our armature repair department show the lathe used for banding armatures and another winding lathe for field coils. The rack used for storing extra armatures that have been repaired and are ready for service may be seen in another view.

We have found that careful attention to the grid resistors on cars reduces many complaints from sudden jerks during acceleration and also prevents abnormal currents which cause damage to current-carrying parts of other equipment. Ordinarily, resistors will give little trouble if properly designed for the particular equipment on which they are installed, but careful attention must be given to keeping the grids tight in the frame, and we have also found that the location of resistors underneath the cars is a very important point. On 40 of our low-floor single-end cars which were purchased in 1916 the resistance was located underneath the rear end of the car. We experienced considerable trouble with the resistors on these cars becoming grounded. It was almost impossible to keep the No. 4 pair of wheels from throwing water and snow up onto the resistors, although we tried to protect them by shielding. The result was that with almost every rain or snow there were several failures. About three years ago we moved the resistance to the center part of the car and also improved the installation by using insulators with a transite board over the resistors. The front and rear ends were shielded against water and snow by sheet iron shields attached to the car floor. This has effectively prevented troubles previously experienced.



Graphs Showing Average Number of Miles per Road Failure and Number of Road Failures per Year for Mechanical and Electrical Defects

The proper maintenance of lightning arresters is another thing that produces beneficial results by reducing car failures. We are using the liquid type of lightning arresters and have had very good results. These arresters are placed under the car seats and are inspected on a 1,000-mile basis along with the other equipment. Although we use outside storage for our cars, we find it unnecessary to remove the arresters during the winter time. We give them a thorough inspection yearly during the month of April so as to be sure they are ready for the first storms.

We have been very successful in eliminating many car failures which occurred during the cold weather due to frozen air pipes. This has been accomplished by the installation of an anti-freeze device in the compressor intake pipe. This device requires no other attention than replenishing the supply of alcohol.

We pay particular attention to our brush-holders, carbon brushes and commutators. The brush tension used is 8 lb. Careful tests, however, have proved that there is very little difference in brush wear with tension between 5 and 8 lb., but we have less trouble from motors flashing with the higher tension. An accompanying line drawing shows the method we use in turning commutators on G.E. 247-I armatures. This consists in turning down the ends to a slightly smaller diameter. We find this much more satisfactory than the old way, because the brush then covers the full width of the commutator and does not leave a ridge or high place at the end from wear. Previously, the formation of ridges at the ends made it necessary to turn commutators which otherwise would be unnecessary, as the riding of the brushes upon the ridges at the end raised them out of contact for the major portion of their length.

The installation and suspension of motor leads is another point that is given considerable attention on our property. Motor leads are brought out from the car body in a standard manner, so that all cars are alike as to the location of the leads. Wooden blocks are used to support the leads and knuckle joint connectors are used between the leads from the motor and those attached to the car body. Pieces of circular loom are placed over the connections and the ends are taped securely so as to keep out water.

In order that the fuses for air compressors, lights and other car circuits may be handy for the car operator we have installed fuse holders on all cars, also a receptacle for burnt-out fuses. These are located in a standard position on all cars, although we have several different types. This reduces the time of delay which might be otherwise serious from blown fuses. In connection with the location of the equipment, we are making this as uniform as possible on the different types, as a uniform arrangement has proved of considerable advantage.

In connection with Table III, which shows the average time to rewind armatures, we compiled this data for each type after a careful check of the work in our armature room. This time includes the tearing out of the old coils, any core or commutator work which may be necessary, the putting in of new coils, soldering of leads, banding, testing and painting, and otherwise preparing the armatures for service.

In addition to the tabulations of car failures for mechanical and electrical troubles, two graphs show the manner in which these have decreased during the past seven years. One of these is for car failures for mechanical and electrical troubles and the other gives the average miles operated per pull-in from mechanical and electrical troubles. Car failures are checked daily, and where they show evidence of having been due to faulty inspection, attention of the particular employee who is responsible is called to this, and if improvement is not shown, other measures are taken.

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More Riders

Through Better Maintenance

The illustrations in this PICTORIAL SECTION show how each department can do its part in selling the service

Relaying Track Without Inconveniencing Riders

NIGHT WORK is not uncommon with electric railway maintenance employees, as they must continually make repairs and replacements or install new construction without interfering seriously with car service. Ingenious methods must be devised and work planned carefully to the minutest detail so that car riders will not be inconvenienced. The above illustration shows how track on Euclid Avenue in the downtown section of Cleveland was relaid at night. Floodlights installed in the overhead produced the illumination. New rail was laid on an old concrete base using International steel ties constructed with flat bars instead of channel connections between bearing plates.

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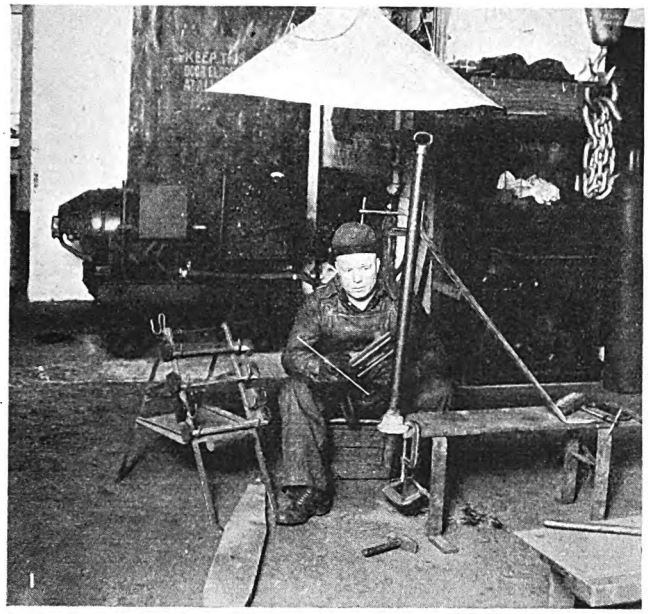
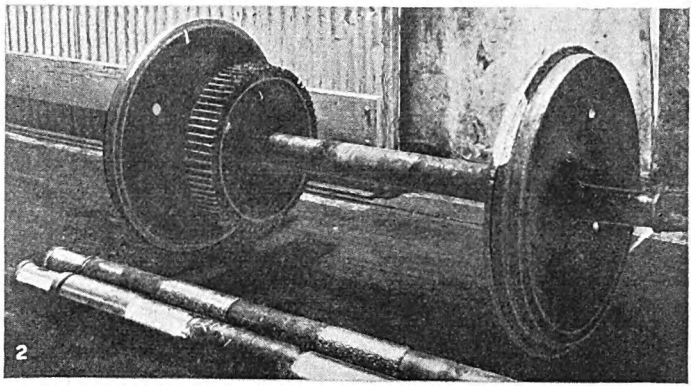
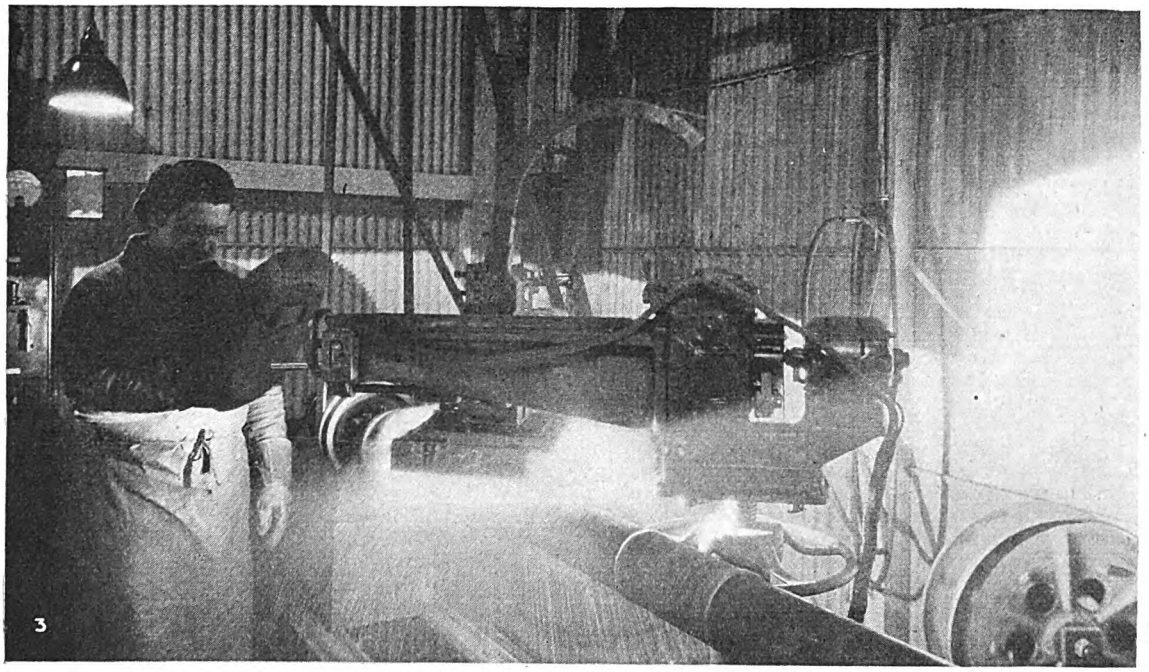
Electric Welding Speeds Repairs

1. Electric welding is found more effective and quicker than riveting for certain repair jobs in the shops of the Northern Ohio Traction & Light Company, Akron.

2. Car wheels have flanges rebuilt and the bearing surfaces of axles are built up by G.E. automatic welding equipment in the shops of the Worcester Consolidated Street Railway.



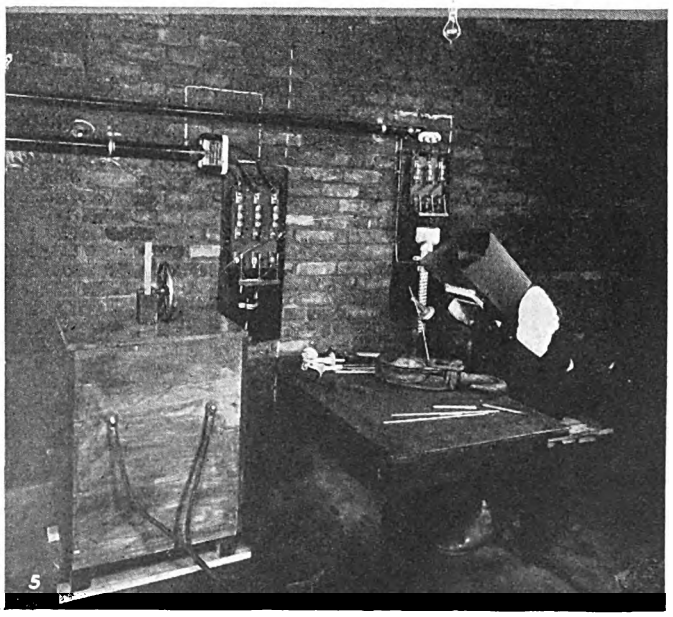




3. This shows the operation of building up worn bearings in the Worcester, Mass., shops. Bare electrode of 5/32 in. diameter and 200-amp. welding current is used.

4. Gear case maintenance with the use of electric welding equipment in the Eastern Massachusetts Street Railway shops at Chelsea.

5. Alternating current is used for welding in Detroit.



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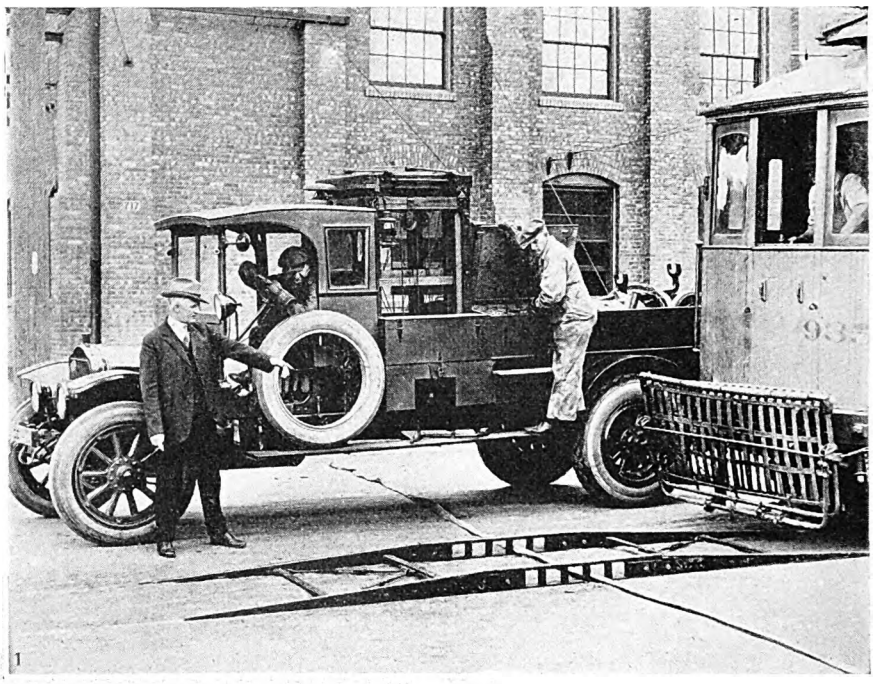
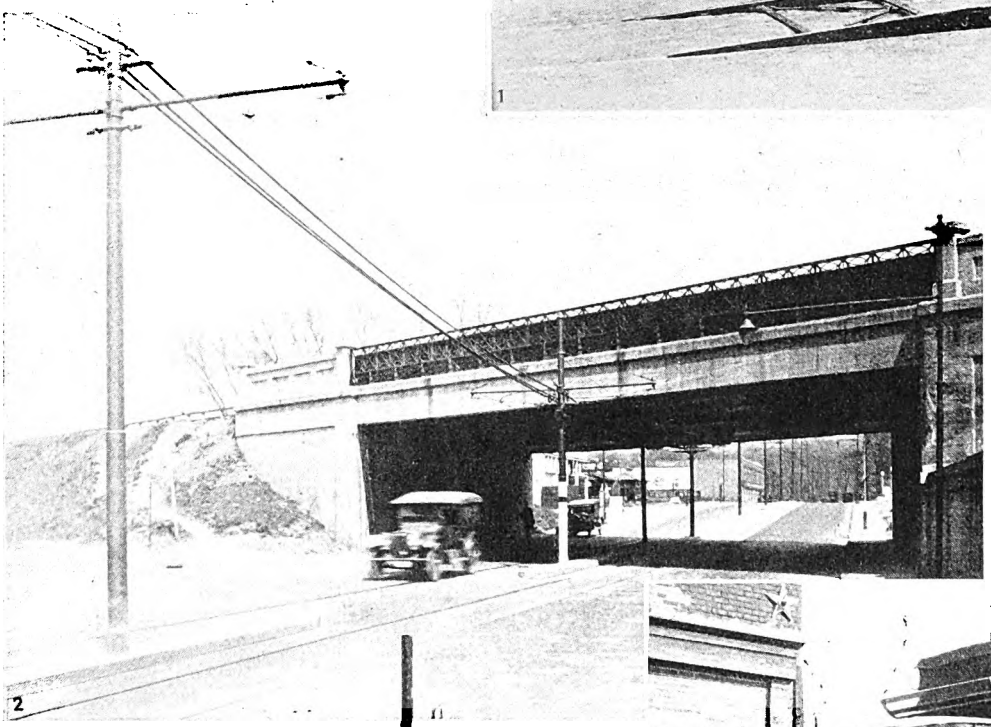
Line Maintenance

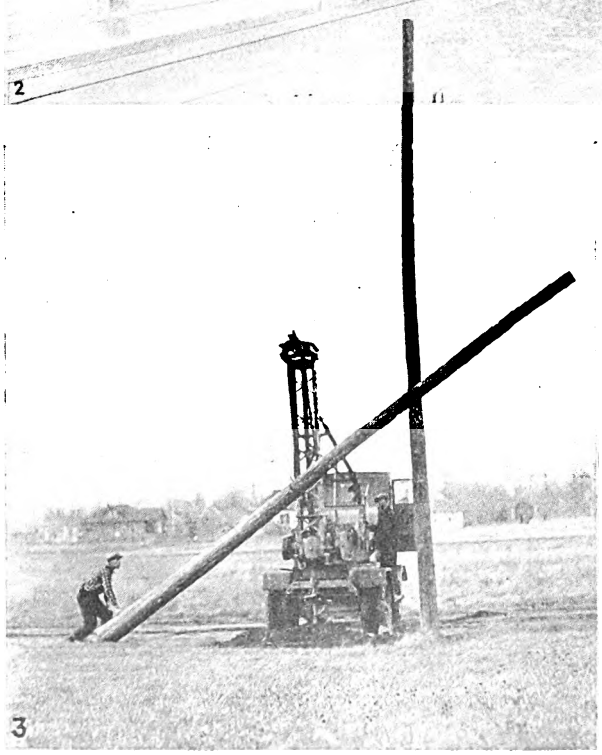
Should Be Directed to Prevent Annoying Delays

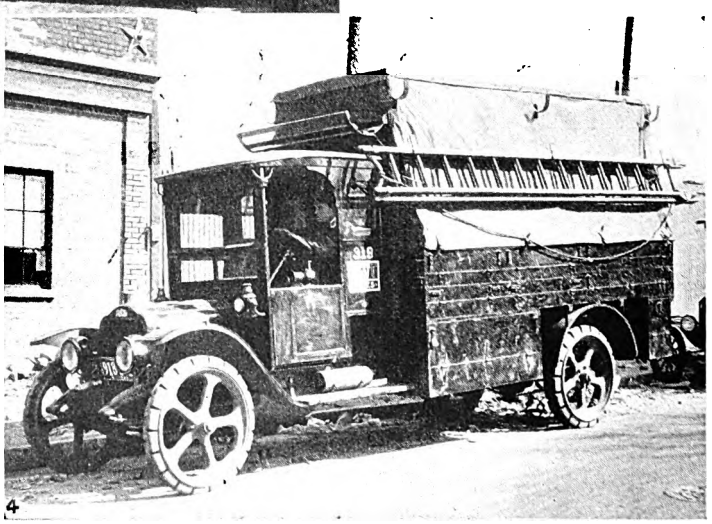




MOTORIZED line repair wagons are rapidly replacing old type tower cars for line maintenance. Trucks can get to the job quicker and can pull out of the way so as not to interfere with car schedules.

Trucks with cranes and mechanical hole-digging equipment speed up pole replacement.





1. In Los Angeles emergency trucks with hose bridges answer fire calls so that car service will not be interfered with.

2. The problem of insufficient space at the side of street for setting poles was solved in Cleveland by constructing a curb in the center of the street and erecting steel trolley poles in this space.

3. Trucks arranged with pole-setting equipment are increasing in use by electric railways.

4. Several new line department trucks of this type have just been placed in service by the Brooklyn-Manhattan Transit Corporation.

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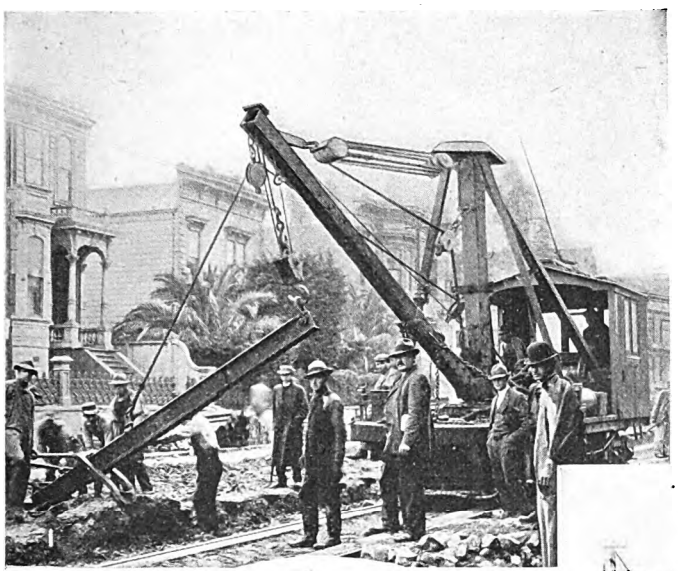
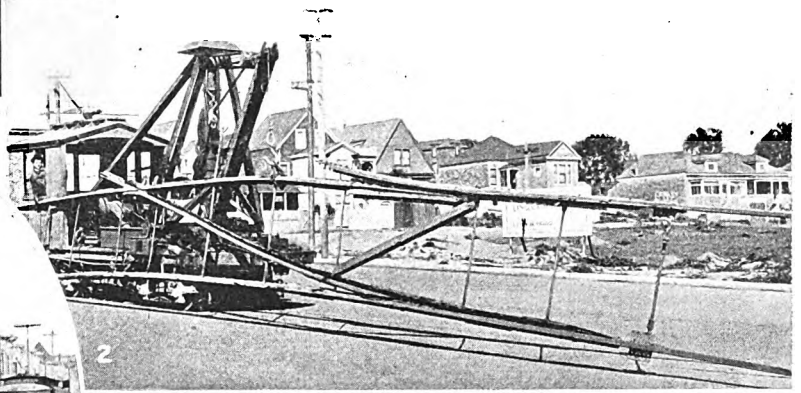
Labor-Saving Equipment Has Many Uses in Track Reconstruction

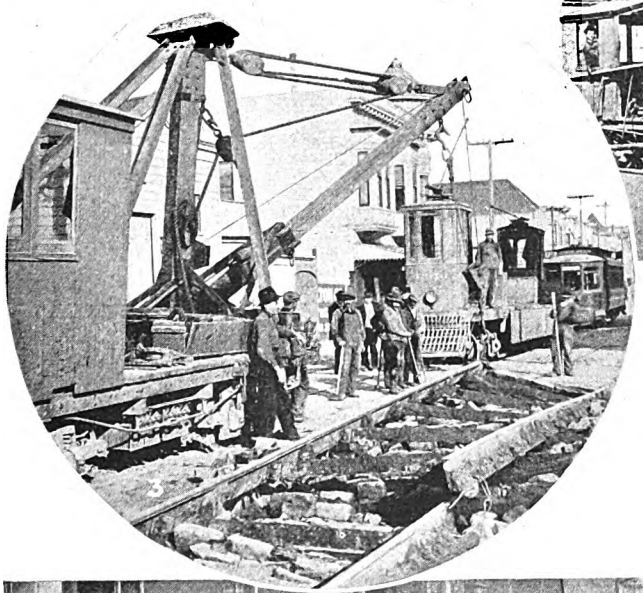


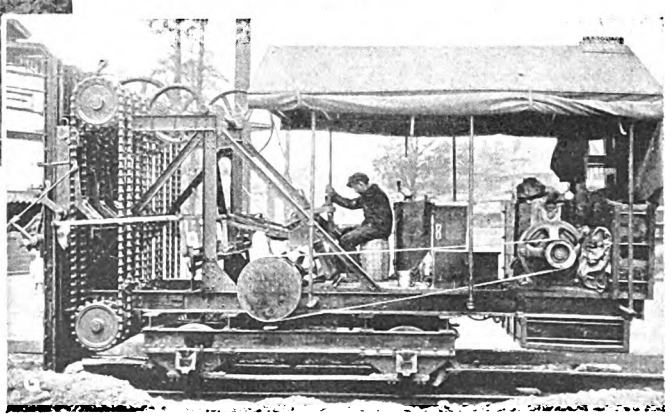
1. A length of rail with a loose link provides additional leverage for the derrick used in San Francisco to pull up an old cable yoke set in concrete.

2. Portable T-rail crossovers are pulled in place by a derrick during reconstruction of double track.

3. Rail ties, concrete and paving are loosened in one operation.







4. A 3,000-lb. hammer with 10-ft. drop is used for breaking up concrete. The hammer is raised by the derrick motor and dropped by release of drum.

5. For reconstruction work in San Francisco, a plow is hauled by a derrick and is returned to the starting point on a small car that runs on the adjacent track.

6. In Cleveland an elaborate type of concrete breaker has proved a great time saver for track reconstruction work.

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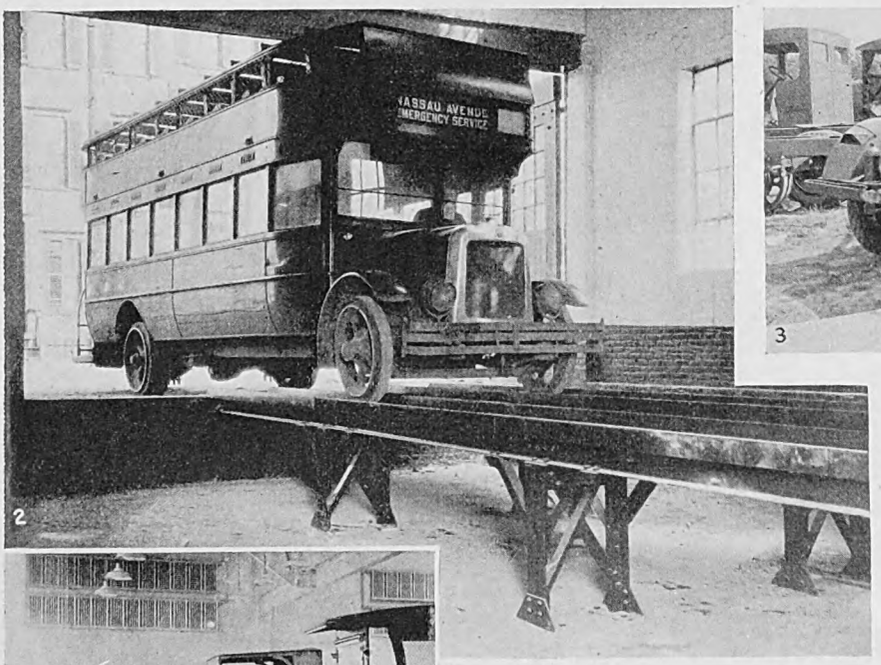
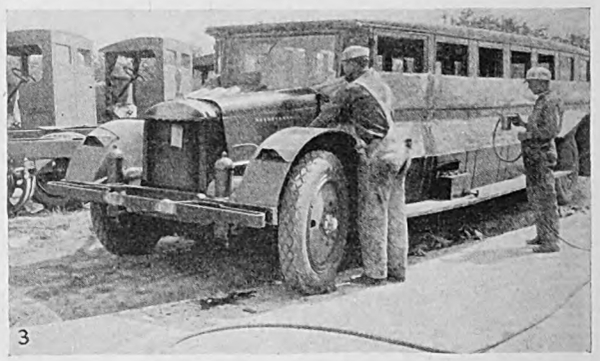
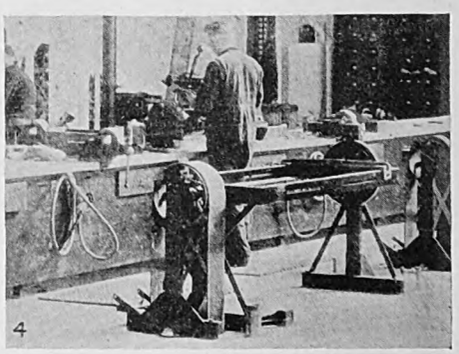
Bus Maintenance

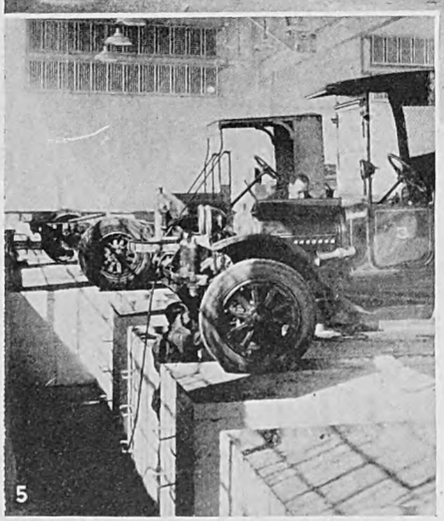
Is an Additional Problem That Electric Railways Are Now Solving

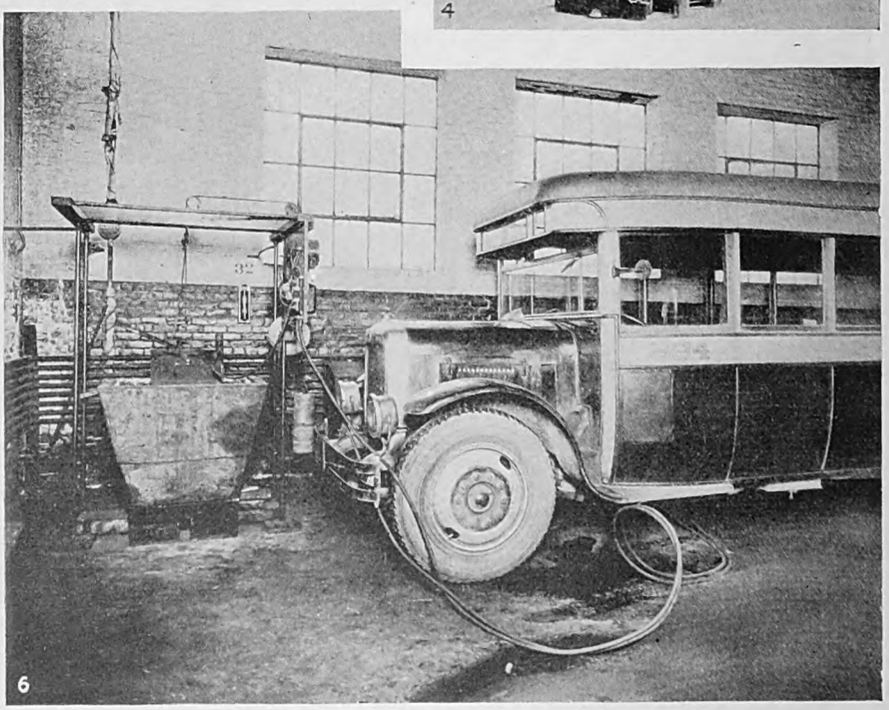
1. Corner of the Kenwood Shop, Akron, Ohio, where transmissions are overhauled.
2. The bus runway in the 24th Street garage of the Brooklyn-Manhattan Transit Corporation is on a level with the street and buses can be run directly into position.
3. When spray painting the stripes on bus bodies, it has been found convenient to use paper strips held in place by adhesive tape.











4. A run-in stand located conveniently to the repair bench facilitates the work of bus maintenance and assembly.
5. Open-end pit construction has many advantages in bus maintenance. Good light may be obtained from windows at ends.
6. In Philadelphia the generators, engines and connections of gas-electric buses are tested under load without removing engine from chassis. The generator is connected to water rheostat and readings of amperes and volts taken for various speeds as shown by tachometer. By burning a definite quantity of fuel the kilowatt output at definite speed per gallon of fuel is obtained.

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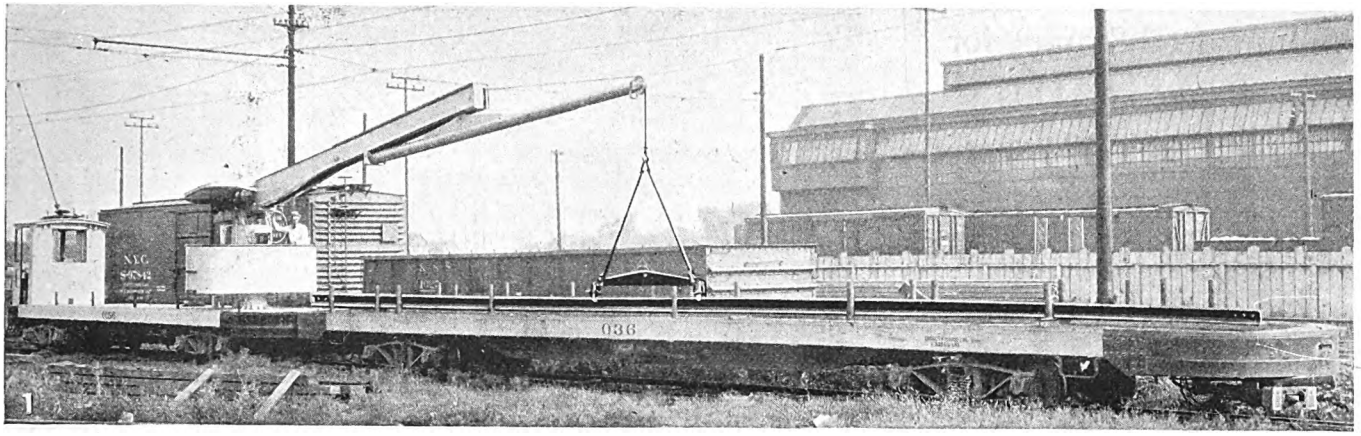
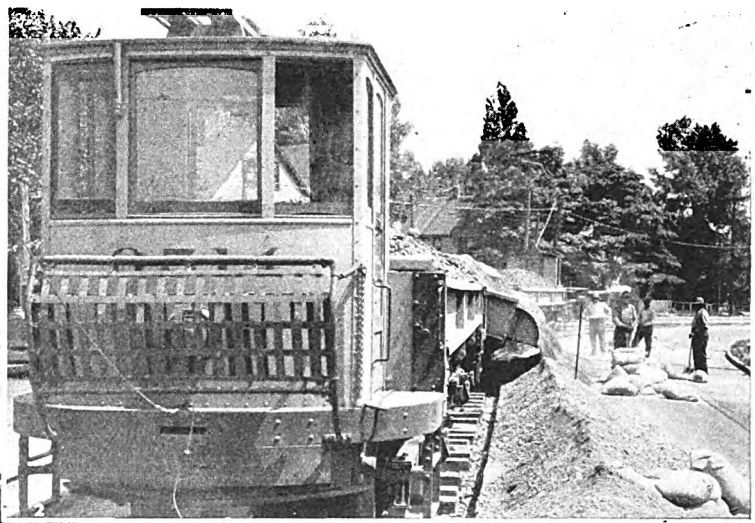
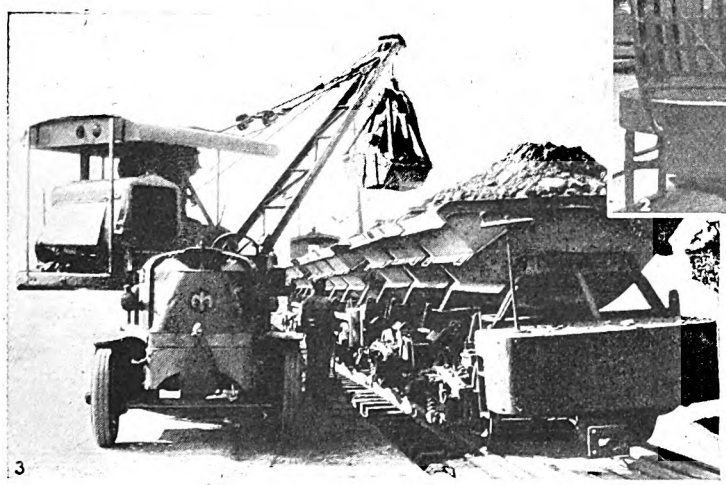


Efficient Material Handling Equipment Reduces Time Necessary for Track Reconstruction





1. An electric locomotive crane car, together with boom extension up to 44 ft., has proved useful in Cleveland for loading rail onto trailer.

2. Dump cars with swinging bodies and sides that serve as an extension when unloading, place material clear of the trench during track reconstruction.

3. Work trains are loaded efficiently by means of a crane with clamshell bucket mounted on a Mack truck.

4. Material which is to be removed from track reconstruction jobs is conveniently loaded by hand into a dump car at waist level of workmen.

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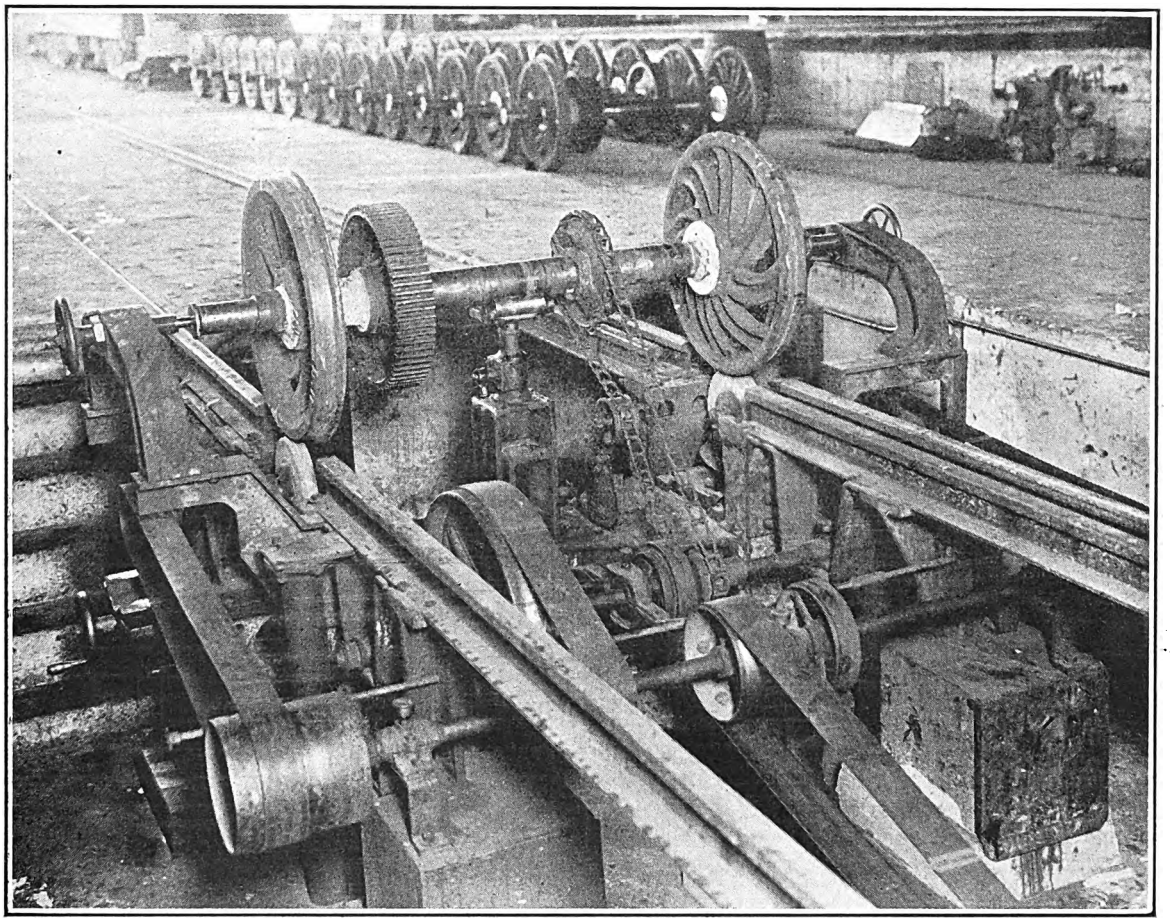
Organizing an Equipment Engineering Department

Engineers Connected with a Railway Property Are in Best Position to Know Where Special Improved Features of Car Construction Will Overcome Troubles, Reduce Maintenance Costs or Give Increased Life

By A. B. Paterson
Vice-President New Orleans Public Service, Inc., New Orleans, La.



Wheel Grinders of This Type Are Assisting in Rapid and Efficient Maintenance in the New Orleans Shops

IN 1921 the New Orleans Public Service, then the New Orleans Railway & Light Company, began the organization of an engineering department under the superintendent of rolling stock and shops. The company has for a number of years made a practice of sending its master mechanics and leading inspectors on inspection trips to various parts of the country. No one property does all things in the best way and practically all properties have certain maintenance "kinks" which possess considerable merit. These trips resulted in the adoption of many improved practices.

It was believed that a separate engineering organization reporting to the superintendent would result in a more systematic procedure in the modernization of all shop practices. Another object of the organization was the development of a system of inspecting and checking shop practices and a system of records which would facilitate analyzing equipment performance. In connection with old equipment it was desired to develop a system of inspection and renewals and replacements with a view to standardization. Another object was the education of operating and maintenance employees by personal contact and instruction books.

During the last four years a large number of new cars have been purchased. A competent engineering organization was essential for the design of these cars and the selection of the proper electrical and auxiliary equipment. With cars purchased from various car builders it is necessary to have fairly rigid specifications in order to obtain a uniform product. The engineers' study of cars operating on the property acquaints them with detail troubles encountered and with the

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desirable features which should be continued. They are thus in a better position than the car builder to design cars which will have a long life and low maintenance under the particular conditions of operation.

In the application of motors the engineers study operating conditions and by calculation are able to select, in the same manner as the manufacturers of electrical equipment, the proper motor for any service. But the local engineers' observations go farther than this. The nature of their other duties is such that they have unequaled opportunity for forming conclusions regarding the performance of existing equipment and are thus better able to select the proper equipment for new cars. Having technical training, they are more likely to look at matters of this kind broadly and not to be unduly influenced by only one factor which for some reason may have received a great deal of attention.

When reviewing the accomplishments of the engineering department it must not be assumed that in the absence of this organization none of the work would have been done. Many of these things were contemplated for some time and were even partially in effect. The engineering department provided the superintendent with a new tool for working out the details and carrying the plans through to a definite conclusion.

As is the case on many railways, the records of old equipment were incomplete and not arranged in convenient form. Drawings, specifications and tabulated records have been made complete in all details. These records have been systematized and made readily available. Drawings and specifications have been provided for shop procedure. As a result the work in all shops is done in a systematized manner.

A standard new car design including all auxiliary equipment has been established. The desirability of this practice has been discussed. Drawings have been made covering the remodeling of old equipment. The principal work of this character has consisted of inclosing car platforms and rebuilding a number of trailers. The property has standardized on two sizes of railway motors which meet all of the present demands and greatly simplify maintenance and lower maintenance

MOTOR No._____ ARMATURE No._____ TYPE_____

ASSEMBLY ROOM MOTOR TEST REPORT

Armature Repairs _____
Armature Tests _____
Field Repairs _____
Field Resistance. Main _____ Comm. _____
Type Brushes _____ Brush Pressure _____
Arm. Brg. C. E. Type _____ Grade _____
Arm. Brg. P. E. Type _____ Grade _____
Axle Brgs. Type _____ Grade _____
Running Test _____
Remarks _____

Date _____ _____ Engineer.

1

Motor No._____ Armature No._____ Type_____
Car No._____ Station_____

MOTOR INSPECTION REPORT

ITEM	X or ✓	REMARKS
Armature		
Arm. Shaft		
Arm. Wiper Rings		
Arm. Brg. C. E.		
Arm Brg. P. E.		
Axle Brgs.		
Axle Caps		
Bolts		
Bolts-Hinge		
Bushings		
Brush Holders		
Brush Holder Yoke		
Carbons		
Fields-Main		
Fields-Comm.		
Hand Hole Covers		
Housing		
Motor Frame		
Motor Leads		
Pinion		

Remarks _____
Date _____
Work Order _____

2

NEW ORLEANS PUBLIC SERVICE INC.

INSPECTION REPORT

CAR No._____
Date_____ 19__ Last Inspection_____ 19__
STATION

I have inspected and now report the following parts in good condition.

	SIGNATURE
TROLLEYS	
Pole, Stand and Wheel	
CAR BODY	
Doors	
Windows	
Seats and Screens	
Gates	
Grab Handles	
Draw Bars, etc.	
Fenders	
Registers and Pulleys	
MOTORS	
Armatures	
Brush Holders and Brushes	
Fields	
Leads	
Cables	
Suspensions, etc.	
Gears and Pinions	
Oiling	
TRUCKS	
Wheels	
Axles	
Journals	
Truck Parts	
Brakes	
CONTROL SYSTEM	
Over Head Switch	
Controllers	
Reverse	
Rheostat	
AIR BRAKES	
Brake Valves	
Air Compressor	
Governor	
Pipes, etc.	
MISCELLANEOUS	
Light Circuit	
Lightning Arrestors	
Signal Bells	
Fuse Boxes	

Car O. K. for Service_____
Car kept in for Repairs_____
Remarks: _____

_____ Repair Foreman.

3

NEW ORLEANS PUBLIC SERVICE Inc.

Dept. Rolling Stock & Shops

EQUIPMENT CHANGES

CAR No._____ STATION_____

MOTOR CHANGE

Type Motor_____

OUT				IN	
Serial No. Motor	End	Date	Defect	Serial No. Motor	Date

COMPRESSOR CHANGE

Type Compressor.

OUT			IN	
Serial No. Compressor	Date	Defect	Serial No. Compressor	Date

LINE BREAKER CHANGE.

Type Line Breaker_____

OUT			IN	
Serial No. Line Breaker	Date	Defect	Serial No. Line Breaker	Date

CIRCUIT BREAKER CHANGE

Type Circuit Breaker._____

OUT				IN	
Serial No. Circuit Breaker	End	Date	Defect	Serial No. Circuit Breaker	Date

Date_____

_____ Repair Foreman

Checked By._____ Engineer

4

A Carefully Worked Out Record System Is Essential to Systematic Maintenance

1. Assembly Room Motor Test Report.
2. Motor Inspection Report.
3. General Car Inspection Report.
4. Report of Equipment Changes.

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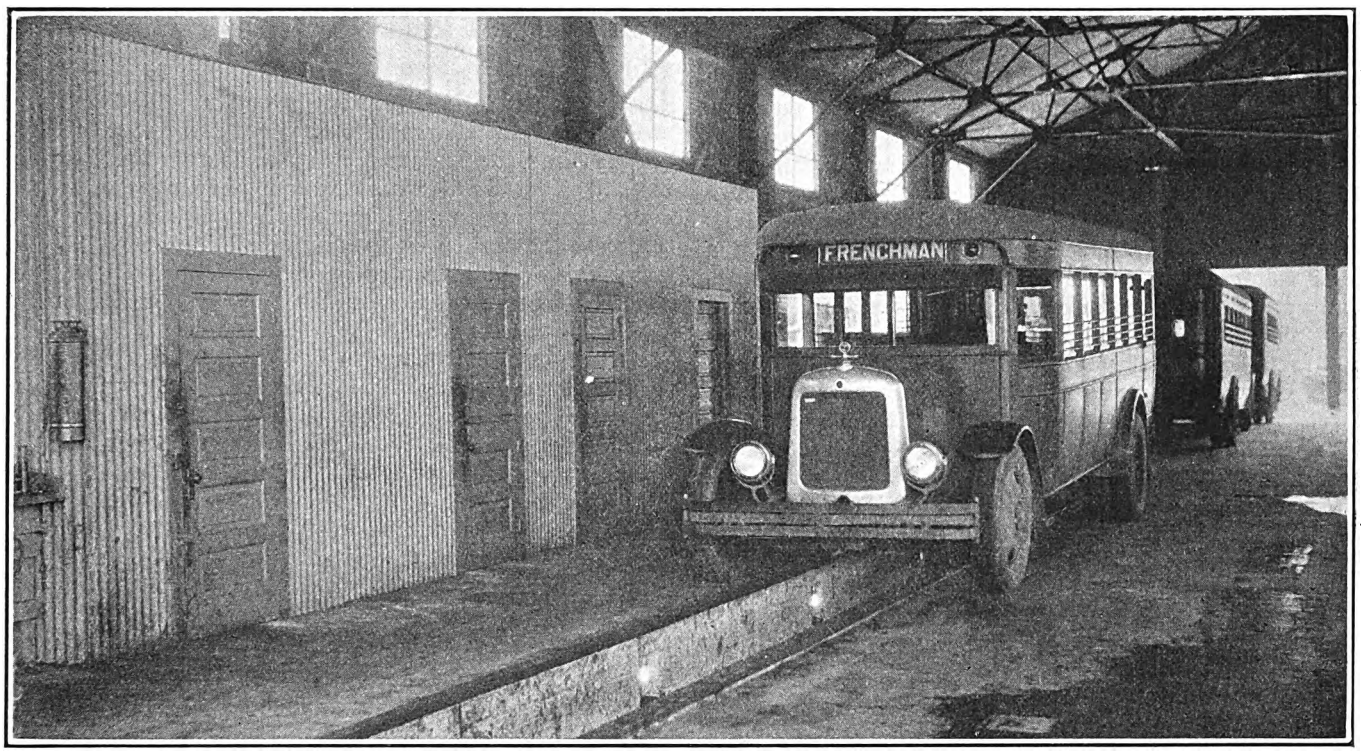
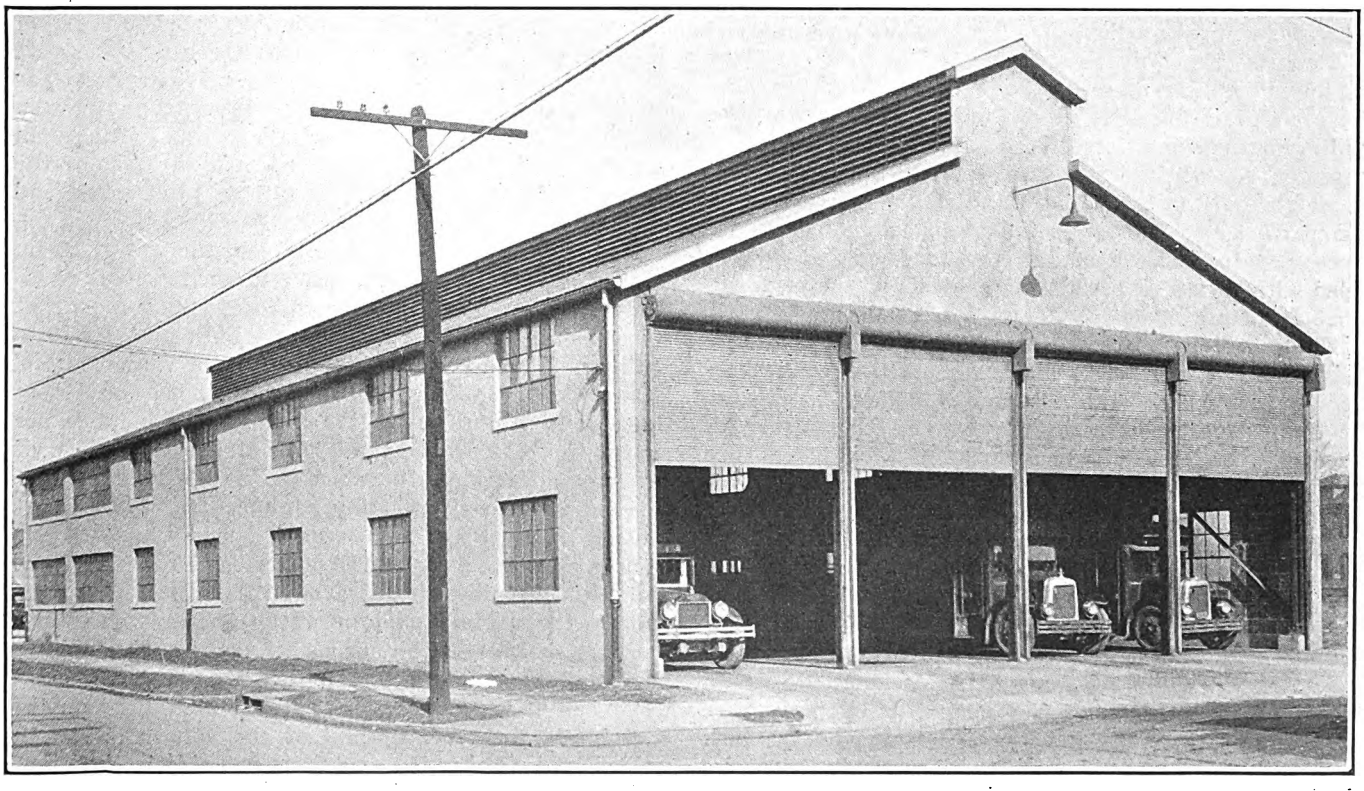


Pit Arrangement of New Garage Constructed for Buses of the New Orleans Public Service, Inc.

cost. However, it is not proposed to follow this standardization blindly and thus stifle progress. When material developments are made the standards will be changed, but progress will be made by orderly steps.

The old shop equipment has been rearranged so as to reduce lost motion and facilitate production. New tools, modern cranes and modern electric car hoists have been installed in shops and stations. The object is to substitute mechanical power for human labor wherever possible. The car hoists especially speed up the changing of trucks.

Wheel grinders of an improved type have been installed in all stations. This special type of grinder was developed after watching the operation of standard grinders. The wheels run freely between lathe centers, while a jack, fitted with rollers, partially supports the weight. By means of a sprocket and chain drive the "idle" and pony wheels, as well as the driving wheels, are ground. A special steel tape is used for measuring the wheels accurately. The wheel grinder is shown in an accompanying illustration. It has two special attachments of particular value. One permits the grind-



New Garage Designed by Engineering Department

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ing of wheels on trucks of different gages. The other is a centering device for the axle so that the wheels will be ground true.

The engineering department designed and put into operation a modern motor repair shop with facilities for testing, dipping and baking, renewing bearings and general overhauling of the motors. Armature open circuits, loose leads and short circuits are located by means of a millivoltmeter. Motors are also given a high voltage test. An electrically heated baking oven and special dipping tanks and steel armature wagons have been designed and built. The dipping tanks are so arranged that the armature is placed in the empty tank, commutator end up, and the varnish is allowed to rise in the tank to the proper height. The heat for tinning and melting babbitt metal is controlled by two pyrometers.

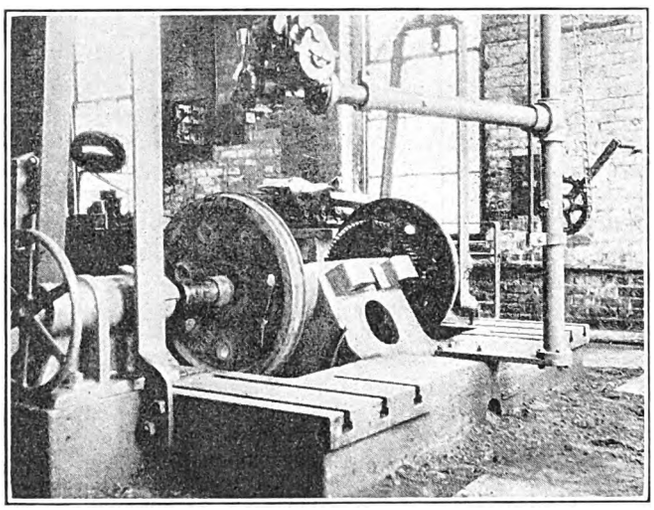
A standard service test has been devised for all cars leaving the shops. When a failure of any part of the equipment brings a car to the shop before its regular inspection period it is given the standard test. Cars are inspected and overhauled on a mileage basis. A standardized procedure and system of records for this work were developed. The form of motor inspection report used is shown.

Instruction manuals for distribution to maintenance employees have been prepared. Such items as wiring diagrams, controller connections, motor connections, brake rigging and bearings are covered. Separate instruction books on trucks, control and resistance, armature and axle bearings and other car parts are available.

Recently the operation of buses has been started. The engineers have designed a modern bus garage providing for modern automotive maintenance practice. The maintenance of the buses has been standardized in the same general way as the car maintenance. No generally adopted scheme of cost records being available, it was necessary to devise a new system, and this was developed with a view of permitting analysis of bus performance in detail.

These activities are, of course, not the limit of usefulness of the engineers. They are continually endeavoring to improve the performance and reduce the expense of their department and their efforts have met with success. As new problems arise the engineers are available to assist in finding a solution and as a result of their training are adept in analysis.

One should not think that to form a successful engineering department it is necessary only to employ a number of technical school graduates. One of the first requisites is to have a progressive man at the head of rolling stock and shops who will support his engineering force in their recommendations. In addition to technical skill the engineers should be possessed of considerable tact. Even with official support the task is a difficult one and much can be accomplished by the hearty co-operation of the shop organization.



Home-Made Equipment for Building Up Sharp Flanges on Steel Wheels, Richmond

Rolling Stock Improvements in Richmond

IN RICHMOND, VA., about half the rolling stock is arranged to be operated by two men and half by one man. A considerable number of the one-man cars are of the Birney type, but the doors open inward instead of outward. This was done to reduce damage to doors from passing automobiles and also because the tracks in the carhouses are quite close together. In the latest car designs inward opening is retained for the entrance doors, but the rear-exit treadle doors obviously have to open outward.

Although the company is buying new cars for one-man, two-man operation it is also rebuilding in its shops for trial two former two-man cars for one-man operation. There will be exit and entrance in front with a second exit in the rear operated with a treadle and fitted with a Bennett air signal. Pneumatic operation is used for doors, fare box and register, being employed for the latter to avoid a register rod through the car. The seats will be green plush. The principal structural work required in the reconstruction of these cars was to lengthen the front platform, and in this change the opportunity was utilized to encase all the dash equipment and provide a "spit hole" in the floor for the operator. The exterior finish of the cars will be green for the roof, orange enamel for the body and cream trimmed with maroon for the vestibule from the dash up. The lettering and striping is black.

The company believes strongly in the traffic-winning possibilities of modern rolling stock. It scrapped 40 cars last year and hopes to do the same with some other cars when fifteen new cars which it has on order with the American Car Company are received. These new cars are of the Birney double-truck type and will have plush seats and linoleum floor covering.

The company is going generally to the use of 26-in. steel wheels for all its city cars and an ingenious welding frame has been constructed for welding a pair of wheels while their sharp flanges are built up by electric welding. The basis of this frame is a former wheel lathe which is fitted with an overhead hoist for lifting the wheels in and out of the lathe. This hoist is not shown in the view. At the side of the base plate of the lathe and midway between the wheels is an adjustable support for the welding equipment. This support consists of a vertical pipe support carrying a telescopic horizontal arm on the end of which is the welding outfit. This arm is swiveled around the vertical support and can be raised and lowered by a crank, gear and sprocket chain. As the horizontal arm is adjustable to any height and length it can be set so that any sized wheel can be welded. As the support is midway on the base block, the second wheel of the pair can then be welded by swinging the arm from one side to the other without any further adjustment.

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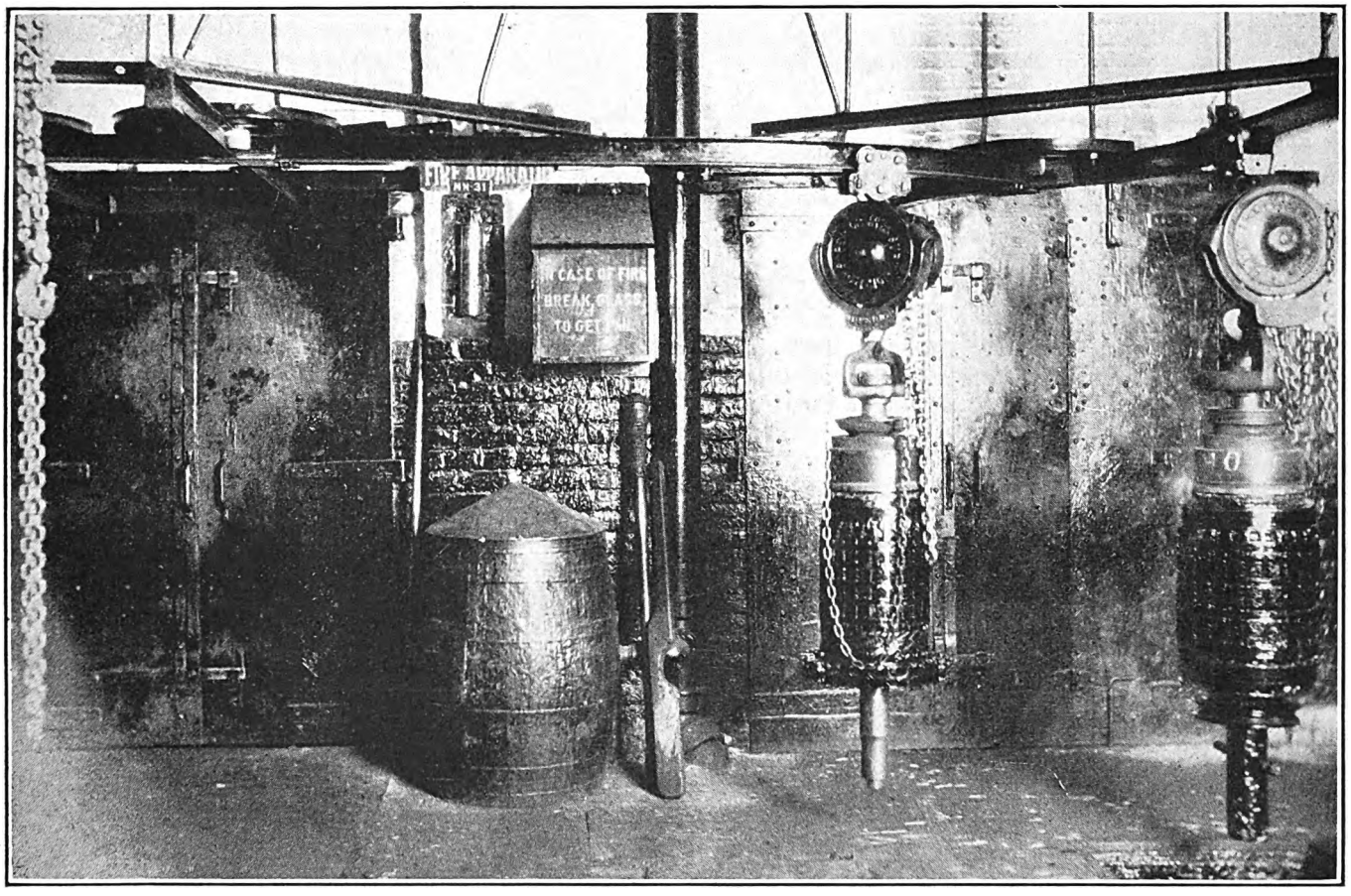
Capacity of Three Baking Ovens Increased 62 per Cent

By an Efficient Arrangement of Racks and Specially Designed Armature Wagons Armatures Are Set on End for Baking—A New Overhead Conveying System Saves Space Needed for Effective Handling

*By O. H. Jorgensen**
General Mechanical Engineering Department,
Pullman Car & Manufacturing Corporation, Chicago, Ill.



The Turntable Arrangement of Overhead Trolleys Provides an Efficient Means for Handling Armatures at the Front of the Oven

INCREASING the capacity of present baking facilities without enlarging the ovens was a problem recently solved by the shop and equipment department at the West shops of the Chicago Surface Lines. The space available for ovens was limited due to the layout of the shop, and when the equipment department was confronted with the need for greater capacity, only one effective way for obtaining it was presented. This was by rearranging the storage of armatures in the oven and providing more effective methods for handling the armatures themselves. Previous to the changes which were made, the total combined capacity of the three baking ovens was 42 armatures. The present capacity is 68 armatures, or an increase in capacity of 62 per cent. This shows what can be accomplished sometimes by an effective study and where added facilities cannot be obtained.

The layout of the three ovens is shown in an accompanying illustration. Oven No. 1 is equipped with low transite covered steel platforms and is used for drying out newly wound armatures, coils and miscellaneous supplies. The No. 2 oven is used for heating armatures and oven No. 3 is used for baking armatures and field coils after they have been dipped. In studying arrangements of armatures in the oven, which would permit of more armatures being placed in them at one time, it was found that armatures placed on end provided the most efficient arrangement of space. It was accordingly decided to provide facilities so that armatures could be handled and be placed in position for baking by setting them on their pinion ends.

A rack placed along one side and across the end of

*Formerly chief draftsman equipment department, Chicago Surface Lines.

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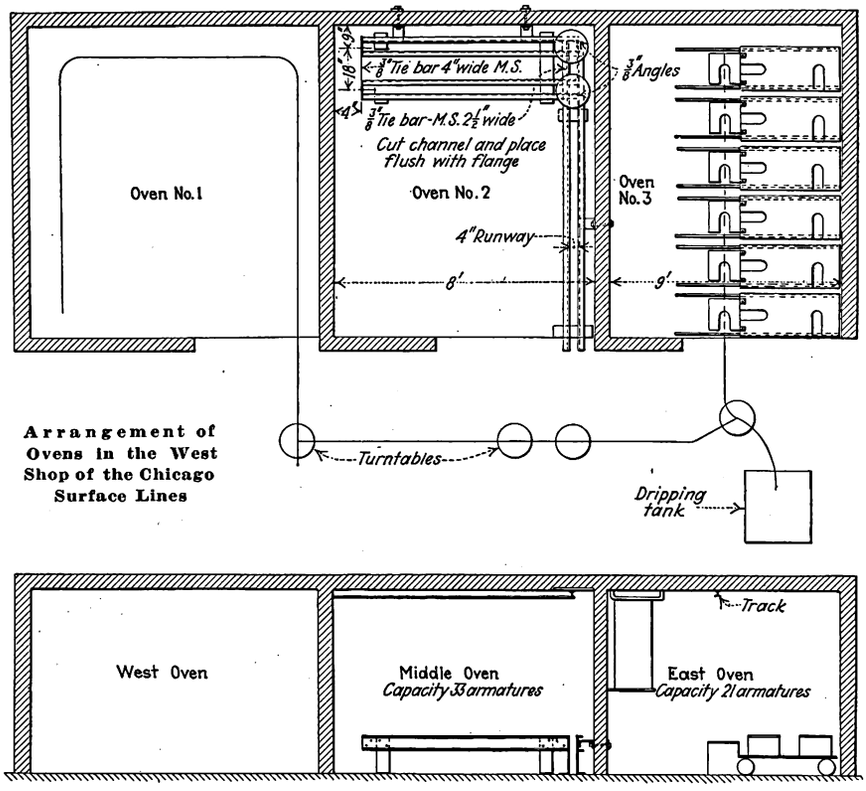


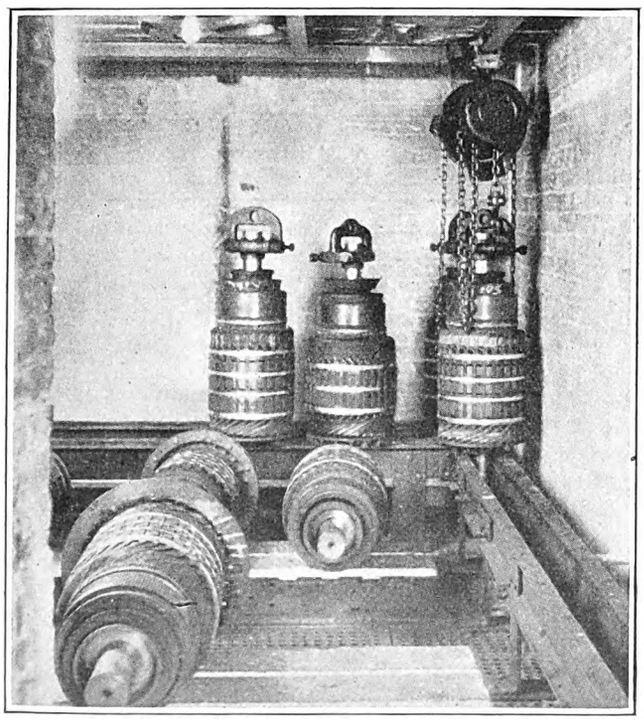
Arrangement of Ovens in the West Shop of the Chicago Surface Lines

oven No. 2, in addition to the old style steel platform previously used, increased the capacity of this oven from fourteen to 33 armatures. An accompanying illustration shows the construction of the rack and the arrangement of overhead track for serving the ovens inside. Standard channel sections are used as the principal members in the rack. Two of these are placed side by side with sufficient space between them to allow the largest armature shaft to fit in easily. The top flanges serve as a support for the armatures, so that the end bell of the pinion end rests directly on these.

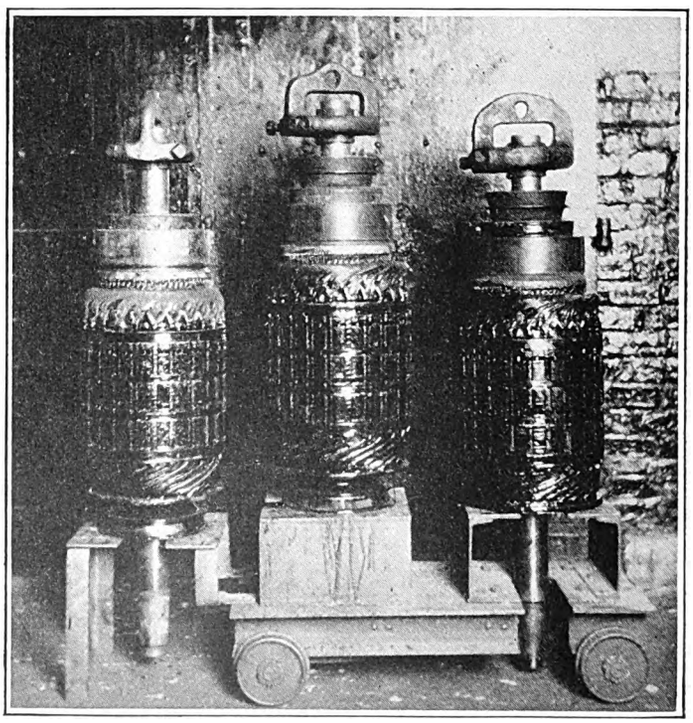
A standard form of overhead track was installed on which a chain hoist operates to place the armatures in position. For holding the armatures while being handled, a specially designed dog with two set screws is used. This dog clamps over the commutator end of the armature shaft and to prevent damage to the shaft a special protection is provided which consists of a spring steel band lined with brake lining material. Accompanying illustrations show several of these clamps in position on armature shafts.

In order further to increase the capacity of the oven, seven small wagons of a design shown in another illustration have been specially designed and built to hold armatures in a vertical position after they are dipped. These wagons are used in oven No. 3 by operating them on tracks which are provided. Each wagon is arranged to hold three armatures supported on their pinion ends. A channel iron framework is used to support the wheels and the top platform is arranged with three stands. Two of these are over the body construction of the truck and the third hangs over one end. This latter stand is arranged so that it can be separated from the main frame. These stands were necessary in order to raise the armatures so that the ends of the shafts will be free from the floor. These wagons permit the maximum utilization of floor space for storing the armatures and in conjunction with the overhead track provide a simple and efficient handling system. This installation increased the capacity of the oven so that 21 armatures can be handled at one time in addition to the field coils.

In order to use the armature wagons and rack most



A Rack for Placing Armatures on Ends Is Installed Along the Side and Across the End of Oven No. 2



Specially Constructed Utility Wagons Are Used for Running the Armatures Into and out of the Oven

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efficiently, a new system for conveying the armatures in and out of the oven was constructed. This consists of a specially designed overhead track, as is shown in another illustration. This provides an efficient method of transferring armatures from the shop overhead track system to the oven system. The height of the ceiling in the oven was but 6 ft. 6 in. This low height, together with the narrow clearances available, necessitated the construction of a special turntable, which, together with all the other mechanical equipment for the oven, was designed and built at the West shops. This turntable has proved very satisfactory and is much smaller than any found on the market. The illustration showing its construction gives an idea of its method of support and shows how armatures are handled on the various tracks without interference.

Both steam and electric heat is used in the oven. Steam heat is supplied from the shop heating system and electric heaters of 1,000-watt capacity are installed in the ovens. These are placed under the oven floors and are connected in banks of four, six and eight heaters. In two of the ovens the temperature is controlled by commercial thermostats, but in the third oven a shop-constructed thermostat is proving very effective. This consists of a No. 000 trolley wire placed under the ceiling of the oven. The wire is 11 ft. long and has an extension through the oven wall to a switch, which in turn is connected to a regulator in the control box. Variation in temperature causes this trolley wire to expand or contract and so regulates the closing or opening of the switch. It is adjustable and operates within a 10-deg. range. A control box at the rear houses the heat regulator, fuses, switches and an ammeter. The four-heater banks in an oven are controlled by one switch. The six and eight-heater banks are cut in by another switch and are subject to thermostatic control.

Quiet Track Gives Low Maintenance Cost

More Attractive Electric Car Service for Patrons Is Essential—Better Relations with the Public Will Result from a Smoother, Quieter and More Attractive Ride

BY H. E. BEAN
Engineer Way and Structures New York State Railways, Syracuse, N. Y.

NOISE in connection with street railway operation has been given but scant attention by the industry until recently. It seems to have been considered one of the unavoidable factors accompanying such operation. Engineers awake to the possibilities of public approbation and appreciation of efforts to effect the most desirable service are attempting to work out the problem in the best and most economical manner. Complaints of noises emanating from street cars show that guests in hotels, worshipers in churches and people congregated for other purposes demanding quiet are the ones most likely to be affected. Unusual noise in any location will immediately bring inquiries and protests from local residents. Trolley patrons seem less critical, but surely are worthy of the greatest consideration.

On every property there is some avoidable noise. The desirability of noise reduction is growing rapidly, but only slight progress can be made without the expenditure of money. Fortunately the accomplishment is subject to any degree of expenditure, but not in direct proportion. A comparatively small amount added to maintenance allotments will eliminate a large proportion of the most disagreeable noises if properly expended.

Noises emanating from track conditions may be divided into the two general classes of (1) noises resulting from the degree of maintenance and (2) noises due to the type of track and pavement construction.

The first is of major interest at this time because it is the cause of the greater portion of noisy operation and also the easier and more economical point of attack. If these noise-making causes be analyzed the five following conditions cover substantially all of those connected with this classification.

1. Special trackwork.
2. Imperfect rail joints.
3. Corrugated rail.
4. Squealing of car wheels in curves.
5. Foreign matter in rail grooves.

Special trackwork will always cause noise, but such disturbance can be minimized by a reasonable attention to the flange bearings and avoidance of loose hard centers. Under conditions of extremely high percentage of operation in one direction grooves may be welded flush, thus providing jump frogs on the occasionally used track. Low track joints or cupped rails should be repaired for economical reasons alone. Blows resulting from these causes are destructive in the extreme and will soon necessitate a much larger expense for repairs.

Corrugation develops very rapidly after the initial waves are formed. When allowed to become aggravated it is destructive of track foundation, pavement and rolling stock. The greasing of curves may, in general, be omitted if the expense is deemed to exceed the cost of extra wear. Under traffic of different wheel flanges, and especially in short radius curves, squealing generally demands application of grease or heavy oil.

These conditions are all noise makers and engineers are familiar with the proper remedies. It seems obvious that the reduction of noise will be accomplished by expenditures which are bound to show good returns through lessened costs by making timely repairs. Unnecessary noise and destruction are synonymous for track structures; lessen one and the reduction of the other follows.

Manufacturers have developed welding and grinding outfits, quick-setting cements, speltering outfits, air tools and many other devices which make for speed and economy in repairing defects at a minimum cost. On new work the difference in noise intensity in the various types of track and pavement construction are slight compared with the above causes. It seems desirable for engineers to investigate local conditions and make such application of cushioning as is merited, but the results accomplished will not be comparable on most properties with those attendant upon higher maintenance.

To summarize, the accomplishments of reduced noise from track conditions might be stated as follows:

1. Ultimate lessened expense due to less destructive blows affecting both track and rolling stock.

2. Better relations with public living adjacent to lines or coming in contact with avoidable noises in home, business, entertainment or church.

3. More desirable service to patrons, providing not only a more quiet but also a smoother and more attractive ride.

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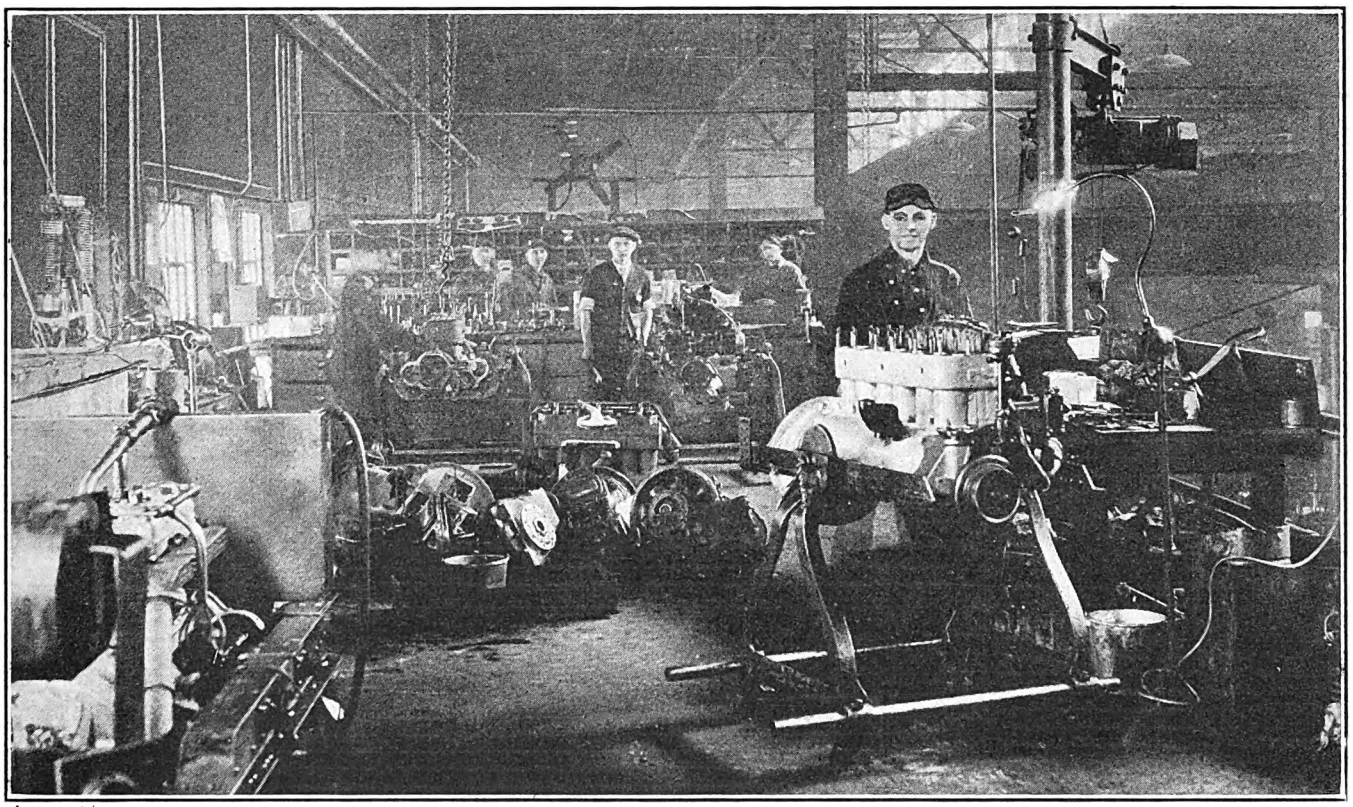
Co-ordinating Bus and Electric Railway Car Maintenance

Men Familiar with Electric Car Maintenance Fit Admirably Into a Bus Maintenance Organization—Bus Overhauling Lends Itself Particularly to Joint Use of Equipment and Men Needed for Electric Car Work

By Pierre V. C. See
Superintendent of Equipment Northern Ohio Traction & Light Company, Akron, Ohio



Bus Motor Overhauling and Testing Department of Northern Ohio Traction & Light Company

EXPERIENCE of electric railway executives in providing an efficient maintenance organization for electric cars will prove a valuable asset when the problem of reorganizing forces to care for bus maintenance has to be wrestled with. The inspection and repair of buses is not essentially different from the inspection and repair of electric cars, and just as the inspection system on cars has to be varied for different types of equipment and service, so the system for maintenance of buses must likewise be varied to suit the service and type of equipment used.

The first thing to do in organizing bus repair forces is to decide on the inspection system. This can be arranged at first along lines found satisfactory for electric car maintenance, or if information is available as to systems used on other properties, the inspection system can be modeled along lines which have been found satisfactory on some other properties which are operating buses. Many alterations, however, will no doubt be found desirable, in order to meet changed operating conditions and different equipment. It will be found that with some types of buses the inspection periods can be lengthened, but if the loads to be carried are heavy and the grades which must be negotiated are severe, it may be necessary to shorten the inspection periods. Local conditions and the type of equipment operated will be found to govern the inspection basis finally adopted.

After the inspection system is once laid out, probably the first alteration will come from the necessity to provide more frequent inspection of parts that are giving trouble and to increase the inspection periods for parts that are not so essential. The experience of the electric railway man will here prove valuable, as he can judge the parts which must receive most frequent attention.

If a considerable number of buses are being maintained, a system of inspection and repair similar to that used for electric cars should be worked out with a section provided for inspection of buses, so that a definite inspection of the body and chassis similar to that used for car bodies and trucks can be inaugurated.

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Convenient Records Are Important in Bus Maintenance

(See page 507)

THE NORTHERN OHIO TRACTION & LIGHT COMPANY

BUS No. MONTH

Day of Month	No. Hours In Service	No. Miles Operated Speedometer	No. Miles Operated Odometer	Gasoline Carriage	Tire Test Daily	No. of Gallons Gasoline	No. of Pints Motor Oil	Lbs. of Cup Grease	Pints SAE 90W Oil	CHASSIS 42-1-B Hrs.	CHASSIS 42-1-B Amt.	CHASSIS 42-1-B Material	BODY 42-1-B Hrs.	BODY 42-1-B Amt.	BODY 42-1-B Material	TIRES 42-1-C Hrs.	TIRES 42-1-C Amt.	TIRES 42-1-C Material	BUS CLEANING Hrs.	BUS CLEANING Amt.	BUS CLEANING Material	REMARKS
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
Total																						

2

TIRE CHANGE CARD

BUS NO.____ DATE____

TIME____ A.M.____ P.M.

TIRE OFF. NO.____

TIRE ON. NO.____

WHEEL NO.

6. 1.

5. 4 3. 2

REMARKS:____

1

Form No. 42A—7-26—1M

DATE IN

ENGINE NO.

BUS NO. OUT

BUS NO. IN

CYLINDER BLOCK

CRANK SHAFT

PISTON PINS

CAM SHAFT

BEARINGS MAIN

BEARING RODS

CONNECTING RODS

PISTONS

DATE TESTED

VOLTS

AMPERES

R. P. M.

REBUILT BY

REMARKS

DATE OUT FOREMAN

3

DATE____

MACH. NO.____ OPERATOR____

4

THE SERVICE RECORDER CO. CLEVELAND

Form No. 670—50M—9-26

Inspection of Bus No.____ Date In____ Date Out____

Speedometer____ Odometer____

Shopped For____

Gasoline—Gals.	O. K. By
Engine Oil—Pints	O. K. By
Engine—Ignition, Vacuum Tank and Windshield Cleaner	O. K. By
Chassis	O. K. By
Tires	O. K. By
Shock Absorber	O. K. By
Propeller Shafts and Bearings	O. K. By
Foot Brakes	O. K. By
Hand Brakes	O. K. By
Chassis Greased, Lbs.	O. K. By
Spicer Joints Greased, Lbs.	O. K. By
Transmission Grease, Lbs.	O. K. By
Differential Greased, Lbs.	O. K. By
Steering	O. K. By
Front and Rear Springs	O. K. By
Radiator and Water	O. K. By
Battery—Water and Connections	O. K. By
Generator	O. K. By
Starter	O. K. By
Lights, Bells and Horn	O. K. By
Bus Body	O. K. By
Doors	O. K. By

NOTE—All material and Tire Changes to be charged on the other side.

Bus O. K. By____

6

Form No. 000 Rev. 9-26

The N. O. T. & L. Co.

OPERATOR'S DAILY DEFECT REPORT

Run No.____ Date In____ 192__

Bus No.____ Time In____ M. Time Out____ M.

Gallons of Gasoline bought on road____

Pints of Motor oil bought on road____

Pints of Trans. oil bought on road____

Pounds of Grease bought on road____

Trouble on road____

To whom reported____

*Bus is in O. K. condition except the following defect:

Signed____ Operator

Repairs made at____ and listed on inspection card. Date____ 192__

Signed____ Foreman

5 NOTE—*Operator must make out defect card, even though bus is in O. K. condition

THE NORTHERN OHIO TRACTION AND LIGHT CO.

BUS RECORD

PART TYPE NO.

	BUS	DATE ON	DATE OFF	MILEAGE	COST OF LABOR	REPAIRS MATERIAL	TOTAL	H. P.	K. W.	REBUILT BY	REPORTED FOR	TROUBLE FOUND

DAILY TIRE SHEET

Tires Stripped	Tires Mounted	Tires on Floor	Tires Sent on Busses	Tires Sent Out for Repairs	Tires Rec'd From Service Co.	Tires Disposed of	Tires Awaiting Disposition

7

RECORD OF TIRE OPERATING COSTS

Tire No. Make	Size	Serial	Cost	Date Applied	Bus. No.	Date Removed	Mileage	Record of Repairs Date	Reason	Cost	Total Mileage	Total Cost	Cost per Mi.

8

New Tires Mounted Date			New Tires Mounted Date		
Make	Serial No.	Our No.	Make	Serial No.	Our No.

10

9

GENERAL INSPECTION AND CLEANING SHEET AT MONTH OF 192

Car or Bus Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Car or Bus Number

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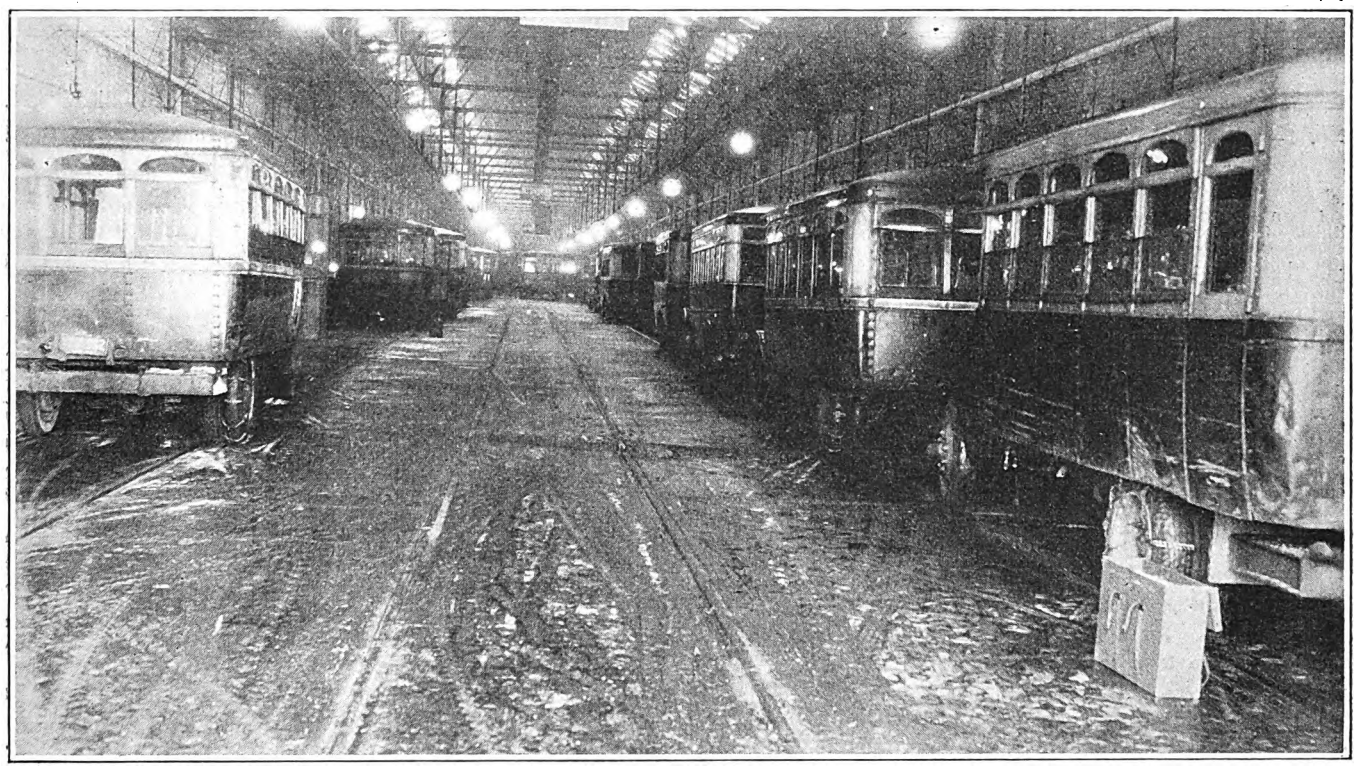
Oil changing, valve grinding and minor repairs can also be taken care of on an inspection basis. An independent department should be established for the overhauling. This should take care of the painting, carpenter work, engine overhauling, transmission and differential repairs and work on other parts of the chassis.

If a very few buses are to be maintained, it will prove advisable more closely to co-ordinate the work of the maintenance forces. Car inspectors may inspect buses and overhauling crews may do certain parts of the overhauling work. There is nothing essentially different or more complicated about a gas engine than there is about the equipment of an electric car. The ignition system or even the latest voltage regulating system is far less complicated than the various circuit wiring for either the type PC or the HL control system. Such control circuits are very familiar to the average carhouse electrician, and the engine and carburetor will be easily understood by men familiar with air compressor and triple valve maintenance. Most electric railway properties start with a few buses, but as the number of units increases it soon becomes necessary to use men exclusively on bus maintenance work.

The work of bus overhauling lends itself more readily to the joint use of men and equipment than does bus inspection. A carpenter familiar with car maintenance makes the finest kind of a bus carpenter, and as practically all electric railways now have some steel bodied cars, carpenters who have been doing railway maintenance work for the last ten years have become very familiar with work in sheet metal and with the composite construction where this type of equipment is used. The woodworking machinery of present electric railway carpenter shops adapts itself easily to the repairing of broken posts, sash and doors that occur frequently on the buses. Bus painting can easily be carried out in the paint shop, and if the truck shop and machine shop are large enough the overhauling work on buses can be most easily handled at these points. The blacksmith shop, electric welding department and the acetylene torch department may all be used to advantage.

As the number of buses increases the addition of grinding machinery becomes more essential. An inside grinder, however, is very useful in the repairs of car air compressors, since it is far more economical to grind a compressor and fit in new pistons than to bore out the cylinders and press in a sleeve as has been the practice in the average electric car shop. When it comes to purchasing new grinding machines, it will be found that the same machine can be used for both classes of work. If the car shop has a turret lathe in its equipment it can be used to very good advantage for making studs, bushings and pins. In bus maintenance there is such a large variety of these small parts that if an attempt is made to carry a stock of all of them the spares would soon reach enormous proportions. Making these as they are required will probably be found more economical at the start. Practically all the machinery of the electric car shop can be utilized in the bus maintenance work. In fact, it is very essential, if any great number and variety of buses are to be maintained, to have good shop facilities available, since it is often impossible to secure bus parts immediately, and it is therefore necessary to weld, forge, machine



Trippers Ready for Afternoon Service in the Inspection Shop of the Northern Ohio Traction & Light Company

Forms Used in Connection with the Operation and Maintenance of Buses by the Northern Ohio Traction & Light Company

1. Tire change card.
2. Monthly record of bus operation, cleaning, etc.
3. Engine card which is attached to each bus engine during repairs.
4. Service recorder chart used to record time that buses are in service.
5. Operator's daily defect report.
6. Card used for inspection of bus parts.
7. Headings of sheets used for bus records.
8. Daily tire sheet.
9. Record of tire operating costs.
10. Card showing new tires mounted.
11. General inspection and cleaning record.

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and often to have parts cast in order to make emergency repairs. By this means the number of spare buses can be kept at a minimum, and on most properties the service requires that a large part of the equipment be available at all times.

The unit system of maintenance should be followed as far as possible. The engine should be overhauled carefully with the idea of getting at least 50,000 miles of operation before it comes back to the shop. This is more than a year's run. With this in view, each part should be inspected and tested before it is returned to the engine. If the parts are not in condition to make this mileage they should be discarded. The engine block should be bored out, the pistons should be weighed up to insure correct balance and the engine carefully assembled. After all parts are in place, the engine should be run in, preferably on a dynamometer, as described in the ELECTRIC RAILWAY JOURNAL for Feb. 9, 1924, page 224. The unit is then ready to be assembled in an overhauled bus. The transmission and differential should receive like treatment. Generators, starters and voltage regulators can be taken care of to advantage in the armature room. These units, after repair, should be used to put in overhauled buses, and the lighter units can be installed in the inspection shop.

Where buses are maintained at different points, some sort of supply service is essential. Thus, on the Northern Ohio Traction & Light Company's system, the Canton shops are 25 miles from the Kenmore shops in Akron, where overhauling is done. We often find it advantageous to send a complete engine by the supply car to the Canton shops rather than to drag a bus over that distance.

The supply of additional facilities necessary to take care of bus maintenance often can be taken care of by remodeling some of the present buildings of the railway

Bus Inspection Schedule

No. 1—750-Mile Inspection on Buses—Five Days

MOTOR

Clean screens in carburetor and all gas lines.
Inspect all gas lines for leaks and also the tank.
Clean spark plugs and check points.
Oil and clean magneto and inspect points and ignition wiring.
Inspect fan bracket and fan and oil same.
Check water pump for leaks and grease pump.
Check vacuum tank for loose fittings and lines, also vacuum tube.
Inspect windshield cleaner and connections.
Check oil level in motor and also oil pressure gage and lines.
Check radiator for leaks, hose and hose connections and supports.
Oil all working parts on the gas and spark control.
Check all quadrants and gears on steering and oil same.
Check generator brushes, tension and charging rate.
Inspect battery, lights, bells, horn and wiring.

CHASSIS

Check grease level in transmission and differential.
Check clutch throw-out, clutch adjustments and pedal.
Check gear shifting and levers.
Check foot and hand service brakes and lining.
Grease propeller shaft bearing and drive shaft complete.
Check front and rear springs for weak and broken springs, also loose spring clip bolts and loose body braces.
Check front axle and steering column and front wheels for loose bearings and dust retaining nut, steering pins and bushings.
Check front wheel alignment.
Tighten all wheel bolts and wheel flanges.
Check rear axle for loose axle nuts.

BODY

Inspect driver's seat, cushions and see that driver's seat is fastened down tight.
Check all cushions and seats and see that they are in first-class shape.
Inspect sash and doors for cracked glass.
Adjust doors and oil all working parts.
Check windshields for thumb screws and rubbers.
Inspect hood fasteners.

No. 2—3,000-Mile Inspection on Buses—Twenty Days

MOTOR

Check valve tappet clearance—0.008 to 0.010 in.
Remove carburetor, clean screens, jets and butterfly.
Clean spark plugs and check points.
Clean and oil magneto and check points —0.15 in.
Check fan bracket, belt and oil.
Check water pump for leaks grease, pump.
Check radiator hose, connections and supports.
Check vacuum tank, gas lines and vacuum lines and fittings.
Check windshield cleaner and connections.
Change motor oil and inspect oil pressure and lines.
Oil all small working parts and inspect quadrant, control levers and gears.
Check generator for high mica on commutator, brushes and brush tension and oil generator.
Check starter wiring, switches and brushes and oil starter.
Inspect all lights, horn, bells, stop and tail light wiring and ignition wiring and conduits for shorts.
Test compression, grind valves if necessary.
Check water in battery and also check terminals and wiring to battery.
Check exhaust pipe and manifold gaskets, exhaust pipe and muffler for gas leaks.

CHASSIS

Check grease level in transmission and differential.
Grease chassis complete.
Check clutch and clutch throw-out bearings, clutch pedals, pins and levers.
Check foot and hand service brake, rods, pedals, levers and pins and oil same.
Check transmission and gear shifting lever.
Check for worn universal joints, fabrics and loose flanges.
Check for worn brake drums, linings, thin and worn out.
Check front and rear springs for weak and broken springs, clip bolts and worn shackles.
Check radius rods for stripped and loose.
Check rebound straps on rear end.
Check gas lines for worn or loose places and gas tanks for leaks and see that gas tank is tight.
Check steering column, bushings and pins and front wheel dust collars and worn and broken bearings.
Check front wheel alignment.
Tighten all wheel bolts and axle nuts and axle flanges.
Check differential for grease leaks and grease on brakes.
Check body braces, exhaust pipe and heater pipe.

BODY

Inspect driver's seat and see that same is fastened tight to the floor.
Inspect all seats and seat cushions for holes and broken springs.
Inspect floor and safety tread in step.
Inspect signs.
Inspect front body braces and dash for loose and broken braces.
Inspect front fenders for loose and broken braces and see that rear wheel housings are not worn through.
Inspect all doors, sash and emergency door.
Inspect for broken and cracked glass in doors and windows.
Inspect windshield for loose glass, cracked and rubber strips and thumb screws.
Oil and inspect all door rigging.

No. 3—10,000-Mile Inspection on Buses—Sixty Days

This inspection will be the same as 3,000-mile with the following additions:

MOTOR

Remove cylinder head, clean carbon and grind valves.
Remove carburetor, clean jets and screens and clean coke and butterfly and on buses that have stew pots, remove carbon.
Remove magneto and check points and replace if worn.
Remove generator and replace with O.K. unit.
Remove starter and replace with O.K. unit.
Remove voltage regulator and replace with another regulator.
Inspect magnetic switch and all terminals and connections for lights, horns, bells, starter, tail and stop lights.
Vacuum tank top to be removed and inspect valve and springs and float assembly. Clean tank and inspect for leaks.
Use new gaskets in replacing top.
Water in the radiator to be changed, inspect radiator for loose core or hood rest broken or cushion for hood missing. Replace if found in bad order.

CHASSIS

Drain transmission and differential; grease, remove plates and check for worn gears and bearings and adjustments. If found worn, replace units. Use same grease unless grit or dirt is found in it.
Inspect all shackle bolts, bushings and replace if worn.
Inspect drive shaft and drive shaft bearings. See that drive shaft is not bent or bearings loose or broken. See that brake drums are not worn or loose.
Inspect front end complete, see that front axle is straight and look at wheel bearings.
Remove rear wheels at axles and inspect bearings and retaining felts.
Inspect all brake rods, levers and bushings. Inspect brake bands and linings.

BODY

Inspect all seats and seat cushions, driver's seat and seat box.
Inspect for bad floors, wheel housings, fenders, front dash braces and supports, safety treads, step.
Check for loose glass in sash.
Inspect grab handles and rails and see that they are tight and not broken.
Inspect fare box railing and fare box for cracked glass and dirt.
Inspect roof inside and outside, also ventilators.
Remove dents in body and fenders, wheels and fenders to be painted.
Inspect front fenders for loose and broken braces and see that rear wheel housings are not worn through.
Inspect all doors, sash and emergency door.
Inspect for broken and cracked glass in doors and windows.
Inspect windshield for loose glass, cracked and rubber strips and thumb screws.
Oil and inspect all door rigging.

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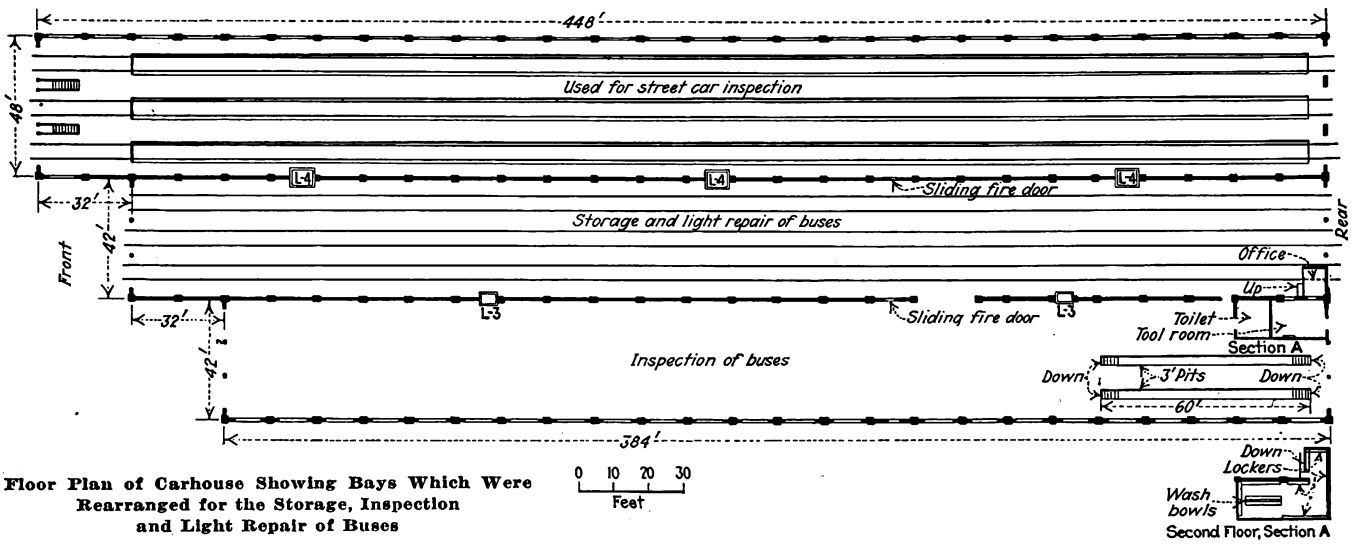

Floor Plan of Carhouse Showing Bays Which Were Rearranged for the Storage, Inspection and Light Repair of Buses

to take care of the bus work. Electric railway properties often have buildings that are not being used that can be converted into very practical garages. As an illustration of such a conversion, accompanying illustrations show a power house from which the old engine and 25-cycle generators were removed to take care of bus storage and inspection. The holes in the floor for the flywheels and accessories were boarded over and a cinder incline was made up to the doorway. The entrance was enlarged to provide space so that buses would go through readily. Twenty buses can be stored in this building. The expenditure necessary to prepare for this use was very small.

An accompanying plan shows the bus inspection facilities at the Kenmore shops, Akron, Ohio, where a covered storage for electric cars was used. The electric cars are now stored in the yards and two large storage bays have been converted into a garage. By cutting a large doorway through the fire wall, buses can be routed so as to go in one bay, through the door and out the other bay, thus saving any backing.

Cement pits have been provided in one end of one of the bays and locker and toilet rooms have been installed. The construction of the pits is shown in an accompanying illustration. In the other bay the tracks were left in and a cement coating was put on top of the ties to the level of the head of the rail. In the bay in which the new pits were installed the tracks were entirely removed, so that proper drainage could be obtained. By running buses four abreast 120 will go into this building.

As the Kenmore shops have a steam railroad siding, gasoline is purchased in carload lots on government specifications. Each car is tapped and a sample is drawn off. This is given the A. S. T. M. standard distillation test. The car is then either rejected, if the test is unsatisfactory, or, if satisfactory, the gasoline is dumped into storage tanks which have a capacity of 28,000 gal. Purchasing gasoline in this way has not only resulted in a big saving but a more uniform grade is secured.

Lubricating oil tanks have also been installed under

The Exterior of an Old Power House Which Was Arranged with an Incline at the Entrance to Permit Its Use as a Garage

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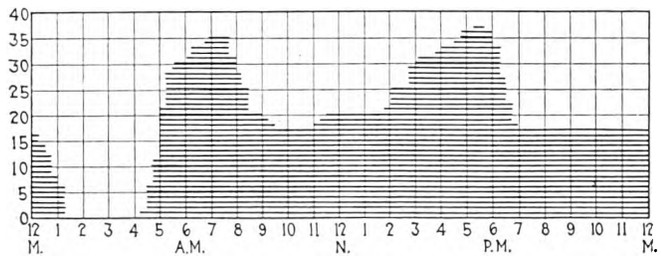
the floor of the garage and lubricating oil is purchased in carload lots under specifications. Illustrations on page 504 show the testing apparatus for both gasoline and oil.

In order to care for the very large number of buses that come into the garage between the hours of 1 and 3 a.m. and leave between 4 and 6 a.m. it is necessary to work out a very careful plan of movement. Each bus as it comes in passes a fare box house, where the magazine is pulled and another is installed. The bus then goes into the garage, where it is turned over to the mechanics, who first fill the 50-gal. gasoline tank. This large quantity of gasoline is needed for the long all-day runs. In fact, it is hardly large enough under winter conditions of snow and when chains are used or where heavy grades are being negotiated. Each bus is then washed on the outside and the amount of oil in the engine is checked. The man checking this oil has a list of the buses which are to have their oil changed. These buses do not receive any oil. The bus is then spotted in the proper place for going out in the morning.

Before leaving the garage the driver is required to make out a written report as to the condition of the bus. Any defects reported by him are taken care of by the night mechanics, but it is desirable to do as little mechanical work as possible during the night. As the



Buses Operated from Central Garage, Akron, Dec. 15, 1925

time that the buses are available for maintenance repairs is short any work must of necessity be rushed. It is also hard to get good mechanics to work on a night shift. For this reason the greater part of the maintenance work should be carried on through a regular system of inspection under a predetermined mileage or time basis, as is done on most electric car systems. An accompanying schedule shows the inspection system which we have developed for our service.

In order to lay out a definite program for each day's work of bus inspection and overhauling, we have found it a great help to have charts showing the hours that buses are needed for the schedule. Two of these charts for service operated Dec. 15, 1925, are shown above. It will be seen from these that more than 50 per cent of our buses are in service continuously except during the hours between 1 and 5 in the morning.

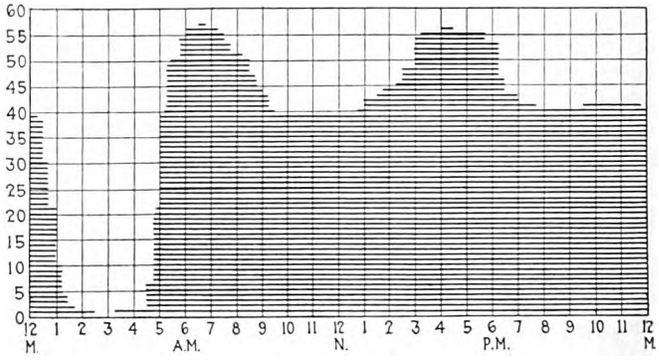
Various forms have been arranged for the keeping of bus maintenance figures and records. The larger the system becomes the more numerous and comprehensive these forms should be made, so as to get the information summarized into such shape that will give executives the necessary information. Samples of some of the forms used by the N. O. T. & L. are shown.

An "Operators Daily Defect Card" is required of every driver regardless of the condition of the bus, so that in case of an accident the claim department is well supplied with information as to the past condition of the bus. The spaces left for the purchase of oil and gasoline on the road have been used very extensively on our system when new lines were bought and on some long interurban runs and sightseeing trips.

The "Inspection" form is used to cover the lighter inspection and all operations are initialed by the man doing the work for the benefit of the claim department. A "Service Recorder" chart is put on each bus every night. This shows automatically when the bus is moving and when it is standing still. This is very useful in checking up drivers and also complaints as to delays in the service.

The "Engine Report" card is put in a celluloid front container and is hung on the engine when it is removed from the bus. Notations are put on, including the maximum horsepower reading. The card is not removed from the engine until it has been replaced in another bus. The card is then entered in the bus overhauling book so that the record of its life may be traced back. An average life of at least 50,000 miles is expected and usually secured; in fact, some engines have gone more than 70,000 miles.

The keeping of tire records becomes very heavy and burdensome when a large number of buses are being



Buses Operated from Kenmore Garage, Dec. 15, 1925

operated, as the changes are made in the streets and under the worst of weather and speed conditions. The system therefore for the tire man must be made as easy as possible. With this in view, the "Tire Change Card" has been made a small pasteboard card which will fit in the roadman's pocket. The tires are all branded and he has only to get the numbers of his tires off and on and also the date, time, bus number and wheel location.

Additional forms are necessary to keep track of the tires mounted on the wheels in the garage and also records as to the cost of each make of tire. Unless every detail of this is followed closely and persistently errors of tire numbers and mileage will creep in and make the records valueless. Unless it is desired to secure some comparative data, tire records of this nature are hardly worth the cost and effort necessary for their maintenance.

The "General Inspection and Cleaning Sheets" are used for keeping monthly check-ups. These are mounted in home-made aluminum folders and are used not only for the checking of buses but also for work on cars. The frequency of any inspection or cleaning operation can be seen at a glance.

So many electric railway companies have gone into bus transportation to a greater or less extent that it is a very opportune time to consider what resources in personnel, equipment and buildings can be combined for the maintenance of both cars and buses.

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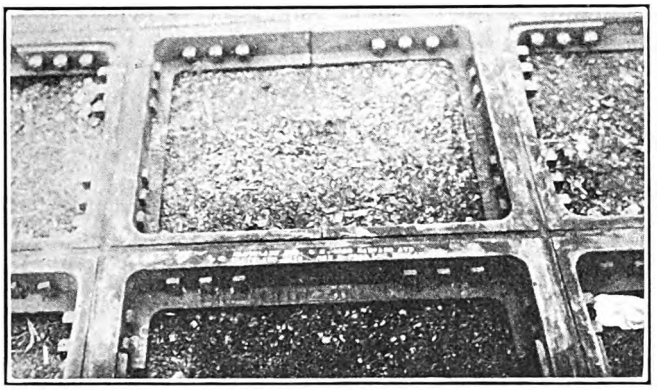

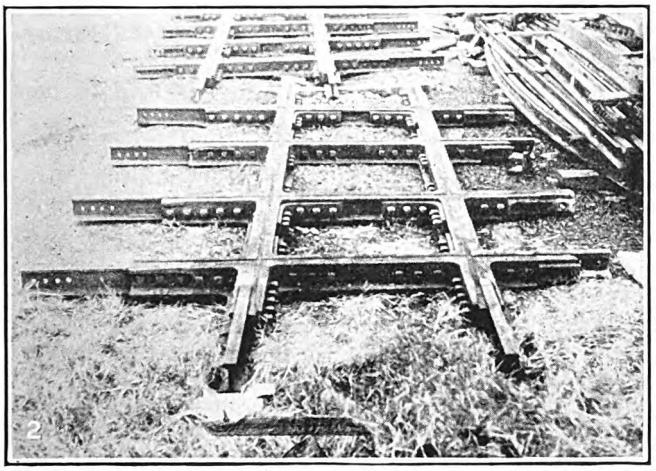

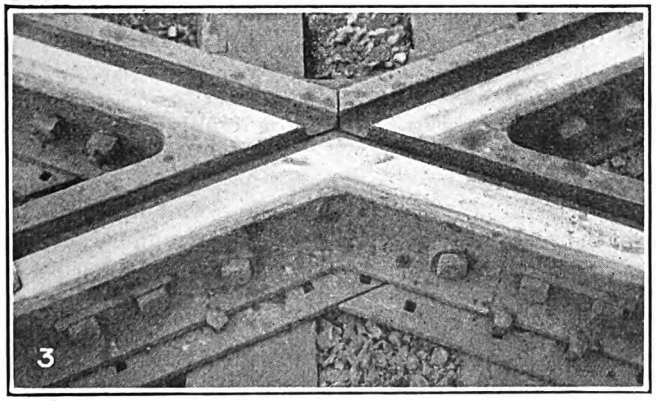

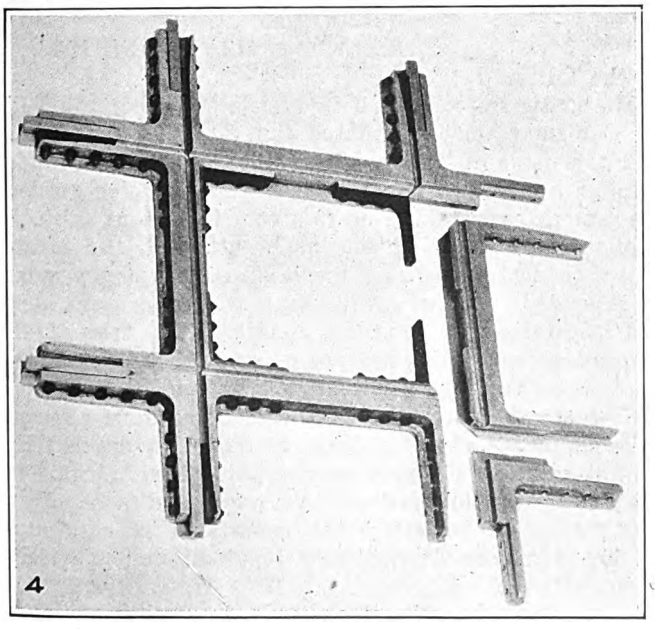

Track Crossings in Cleveland Reduce Noise

Nearly Four Years Experience with Three Crossings of the Balkwill Type Indicates Success in the Elimination of Breakage and Much Noise—A Fourth Is Now Being Constructed

FOLLOWING the success of the first three crossings of the Balkwill type, the Cleveland Railway is about to install a fourth at the intersection of Euclid Avenue and East 30th Street. While long life is the principal claim by the makers of this type of crossing, it can also be constructed to eliminate much noise common in special work. The first three installations in Cleveland have been in service for nearly four years and have required practically no maintenance. An inspection in February of this year showed no sign of breakage and only normal wear.

Steam roads have used nearly $2,000,000 worth of crossings of this type, with the result that many have standardized on it when specifying manganese crossings. Because of the high speeds and absence of the necessity for noise reduction, crossings designed for steam roads are not of the flange-bearing type. Electric roads operating in paved streets find it desirable to specify the flange-bearing type to reduce the noise as well as to obtain longer life.

Two views are shown of one of the crossings before installation at Euclid Avenue and 105th Street in 1922. Another view of a model illustrates the principle on which the crossing is constructed. Essentially this single-track crossing consists of twelve pieces as shown in the partially exploded view of the model. All are constructed of 12½ per cent manganese steel. Extra heavy heat-treated alloy steel bolts hold the pieces together.

Two reasons are given for the success of this type of construction. First a solid cast crossing tends to break essentially along the lines forming the natural joints of this newer type, so that when bolted together the strains do not tend to create new breaks, but are relieved ever so slightly by the natural give of the bolts. Due to the tapered machine fits these strains do not subject the bolts to a shearing stress, but place them practically in tension, the natural stress the bolt can best resist. The second reason is that in quenching the component parts the points subjected to greatest wear in the final crossing are quenched first and are necessarily more dense. The softer metal, or that under greatest internal strains due to the tempering process, is away from the greatest wear points. Great masses of metal are avoided as compared with the solid cast type, so that the internal strains should be relatively less. Even these are removed from the points that receive the hammer blows caused by operation.

Flare blocks, first used in the Cleveland installation, lift the wheel on the flanges over the joints of the crossing legs with the rolled steel running rails. The

Construction Details of Track Crossings Used in Cleveland

No. 1. Close-up view of Balkwill type crossing taken just before installation in 1922.

No. 2. Complete double-track manganese crossing before installation at 105th Street and Euclid Avenue, Cleveland.

No. 3. Close-up of one rail intersection of typical Balkwill crossing used in steam road service.

No. 4. Exploded view of a model of a Balkwill type crossing, showing bolted type of construction made from twelve major pieces.

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wheels are thus picked up and gradually let down away from the ends of the rails, thus avoiding hammered ends, so often a source of trouble. These flare blocks, also made of manganese steel, can be seen in the partially exploded views.

Complaints of excessive noise from nearby apartment houses, common before the installation of these crossings, have been practically eliminated. The crossing at 105th Street and Euclid Avenue was installed over night by a crew of the railway. While it was impossible to obtain a high grade concrete base with so short a time for setting, the crossing has operated satisfactorily without breaks and without maintenance for nearly four years. It shows no sign of failure, and only normal wear. It is estimated that this type will outlast four bolted rolled steel types or at least two of the solid cast type, and instead of breaking toward the end of its life will wear out from normal wheel passage. This insures relatively less noise, not only while new but also toward the end of the normal life, since a broken crossing is particularly noisy and hard on the equipment passing over it.

In building the crossing care is required to obtain accurately machined fits between its legs and the standard running rails that must be joined on to them after installation. Apart from this the job is fitted and adjusted accurately in the factory before shipment. The latest crossing for the Cleveland Railway is being constructed by the Pettibone-Milliken Company of Chicago, Ill. An early description of this type of crossing appeared in ELECTRIC RAILWAY JOURNAL for Jan. 26, 1918.

Claims Work Reviewed by Safety Council

SEVENTY per cent of the electric railways paid less than 3 per cent of their gross earnings for claims during 1925, says a bulletin issued by the National Safety Council, whose membership includes more than 150 corporations in this industry. Although the 1926 Safety Congress is still several months distant, the electric railway section already is making plans for its sessions and the subject of claims will be one of the most important topics on the program. How member companies manage to keep their claims down to a minimum will be told by various safety engineers.

At a recent meeting of the electric railway section of the National Safety Council encouraging reports were made by the various committee chairmen. John J. Connors of the Nashville Railway & Light Company stated that his company paid only 2.8 per cent for claims during 1925, against 6.8 per cent paid in 1921 before joining the council.

The committee on recommendations of the section, composed of E. K. Eastham, chairman; Samuel H. Reid and Victor T. Noonan, has developed a program for standardization of street railway accident statistics, which will be carried out in conjunction with the claim section of the A. E. R. A.

Marked interest is being shown in the monthly news letter which is being issued by Secretary Eastham of the electric railway section.

It is the hope of Chairman J. J. Connors of the membership committee that during 1926 a larger number of electric railways will participate in the activities of the section. At the present time Mr. Connors is issuing a series of letters outlining the advantages of membership. He feels that a great many electric railways are not familiar with the work that is being done by the National Safety Council, which is a co-operative, non-profit-making institution supported by community safety councils, corporations and public-spirited citizens interested in preventing accidents on the streets, at home and throughout industry.

The Readers' Forum

Are Your Small Tools Efficient?

MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASS., Feb. 23, 1826.

To the Editor:

In looking over numerous articles relating to new machines and machine tools, it appears that increased capacity has been stressed, particularly in new designs. The various improvements provide for increased production, freedom from trouble and more uniform and accurate work. It seems to the writer that very often the fact is lost sight of that even with this new equipment the quality of work turned out is dependent very largely upon the small tools used in the machine. While much thought, time and attention are given to the selection of the machine tools themselves, there appears to be, except in very large production shops, very little real investigation as to the actual results obtained from small tools. Of course, the cost of these in proportion to the cost of the machine installation is small, but if an adequate return is to be had from the large investment in machinery, it is absolutely necessary that time and thought be given to the selection of the small tools. These should be bought on a quality basis rather than on the basis of first cost, as many times the slight difference in cost on the original purchase will return large dividends in the matter of increased production, freedom from trouble, more uniform and accurate work.

W. T. READ,
Vice-President and Treasurer.

Good Maintenance Reduces Costs

UNITED RAILWAYS & ELECTRIC COMPANY
OF BALTIMORE
BALTIMORE, MD., Feb. 27, 1926.

To the Editor:

The criticism contained in article "Footing the Bill for Car Improvements," dated Jan. 20, 1926, appearing over the name of "Master Mechanic" is evidently made through a mistaken idea of the principles which guided the committee in taking up this very important subject. Without an ideal no object can be attained, and to attain this ideal means that much effort and money must be expended. But who will say that if cars were kept and maintained in first-class condition and free of all unusual noises, and therefore more attractive and efficient, the costs would not be worth while? It is due entirely to the fact that most companies have allowed their standards of maintenance to fall to low levels that cars go rattling along on poorly maintained tracks. It is up to those interested each year to spend more effort and money on bettering the conditions of cars and tracks. These results will soon repay all moneys wisely spent.

A. T. CLARK,
Superintendent Rolling Stock and Shops.

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Dick Prescott Rides to Work

And Visits with a Passenger

DICK PRESCOTT, engineer of equipment of the Consolidated Railway & Light Company, rode to work regularly on the Greenhill line of his company. Although several of his neighbors frequently tendered Dick a lift in their automobiles, he preferred to ride the cars because of the suggestions he frequently picked up through his experiences as a passenger.

The new management of the Consolidated continued to inject enthusiasm into the organization. The subject of selling transportation was frequently discussed in meetings and bulletins were sent out by the general manager. Stress was laid on the fact that railway employees are the actual salesmen of the company, as they meet their passengers each morning and night on the cars.

In all of this discussion Dick had felt that the mechanical department was on the side lines. He rather envied the fellows in the transportation department who were more directly taking part in this new and interesting activity of trying to create satisfied riders.

These thoughts stood out in Dick's mind one morning as he watched the operator of his car making friends for the company by the newborn courtesy and attention that was beginning to be quite noticeable among the platform men. Absorbed in his thought, he was a little startled when the passenger at his side, noticing Dick's interest in the operator, was moved to comment on the service.

"That motorman is certainly a fine fellow," said Dick's seat companion.

"Yes, I have just been noticing him," replied Dick courteously, "he makes riding on his car a real pleasure."

"That's a fact. This company has been making some marked improvements recently. I've ridden this line on and off for fifteen years and it's only during the last few months, since they put on those nameplates, that I've known the names of some of these men."

"It makes the service more human, doesn't it?" commented Dick.

"Noticeably so," replied the passenger. "They seem to have done many other things that help out also. I think these cars ride much better than formerly, and they certainly make less noise."

"They do ride better," agreed Dick. "The springs were recently replaced with new ones that are better designed for the loads imposed."

"Oh, is that so? I didn't know that, but I did notice the difference in the riding of the cars. Does that also account for the reduction in noise?"

"It probably helps, but in addition to that all the maintenance work on the trucks is being watched more carefully than formerly."

"That accounts for it then. Are you connected with the street car company? You seem to be well acquainted with the construction of the cars."

"Yes," answered Dick. "I am in the mechanical department at the shops."

"That must be interesting work."

"It is very interesting, indeed. When you consider that each of these cars makes about 35,000 miles every year, you can readily understand that the maintenance work becomes of major importance."

"My, that's certainly a lot of mileage! I had only 30,000 miles on my last automobile when I turned it in."

"It takes quite an organization and very careful work to prevent service failures."

"Well, you seem to have improved there too, because we formerly had frequent delays on this line. But the service is much better now. At one time I drove my car to the office every day because I got tired of getting down late. Recently, however, the people in our block have been leaving their cars at home. I decided to give the service another try and have been riding regularly since."

"That's going to help the company to improve the service still further," said Dick, "because the added revenue will make that possible."

"I had never thought of that. Maybe that's why they started fixing up the track on this line."

"That probably explains it in part, but you see it's a cumulative process. Better service increases revenue, and the increased revenue in turn makes possible still more improvement in service."

"Well, that's very interesting. Thank you very much. This is my corner. I'll have to leave."

Dick started his work with a new enthusiasm that morning. "Why, it's just like any other business," he thought, "and these fellows in the shop determine whether or not the salesman has a satisfactory product to offer."

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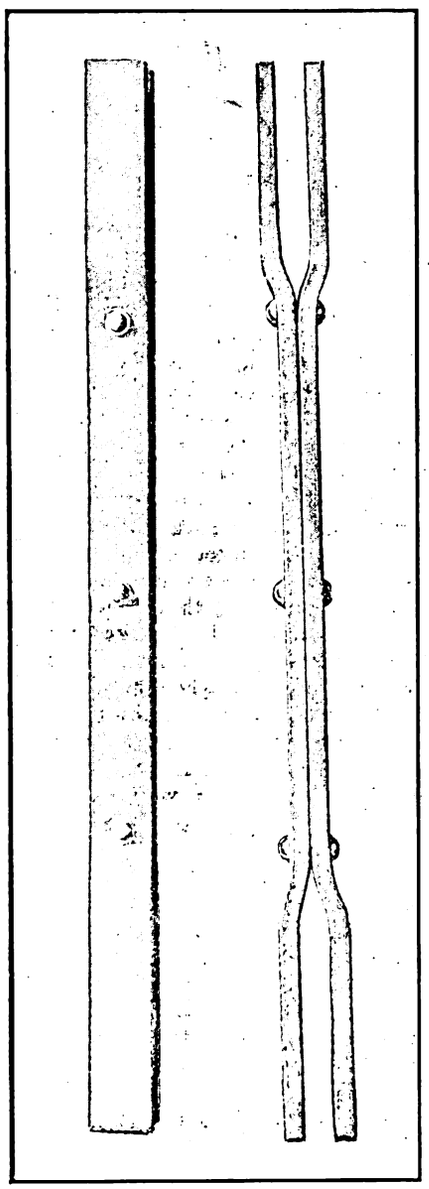
Maintenance Notes

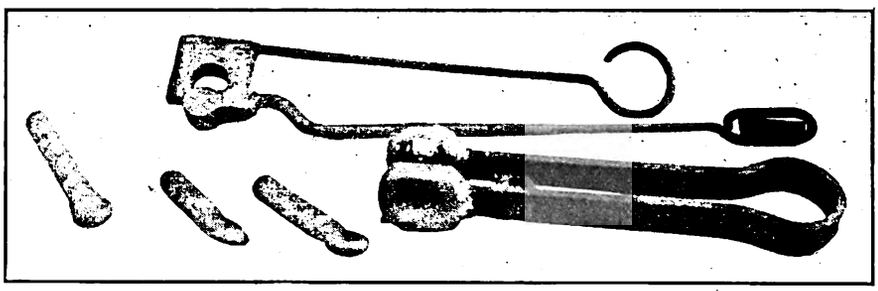
Built-Up Brake Tie Rods

USUALLY tie rods for foundation brake rigging are made by forging the jaws separately and then welding these to round rods. Where welding is not done carefully the rods fail at this point. The Northern Ohio Traction & Light Company has had several broken brake rods due to defects in the material where it is welded. With the hilly conditions under which cars operate in Akron, Ohio, a break is very serious.



This Built-Up Type of Tie Rod Effectively Prevents Breakage

A built-up type of tie rod has been designed by Pierre V. C. See, superintendent of equipment. This is shown in the accompanying illustration. It is somewhat heavier than the type of brake rod which it supersedes, but its sturdy construction is of benefit in preventing breaks, as no difficulty from this source has arisen with this type. The tie rod is formed of two pieces of steel of $\frac{5}{8}$-in. x $2\frac{1}{2}$-in. cross-section. These are formed to the desired shape in a bulldozer and are then riveted together by three large rivets. This type of rod is easy to construct and maintain.



Dies Used for Forming and Finishing Step-Adjuster Bolts

At the left in the foreground are shown the three stages of forming. The die used to form the end of the bolt is in the right foreground and the tools in the background are for clipping off the burrs which are left from the forming operations.

Convenient Tools for Forming Step-Adjuster Bolts

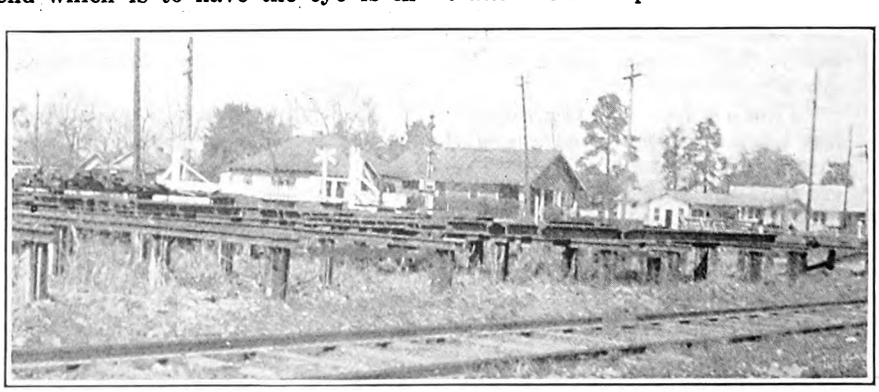
BOLTS used to connect folding steps to the operating lever on cars of the Eighth Avenue Railroad, New York City, consist of a threaded length of about 8 in. with an eye formed at one end. These require replacement for worn threads and for wear in the hole at the end. In forming new bolts a few simple dies have been found of particular benefit.

The stock used for forming these adjuster bolts is $\frac{7}{8}$ in. diameter. The end which is to have the eye is increased in diameter by heating and up-ending. It is then placed in the forming tool shown in an accompanying illustration. A blow from the hammer forms the end and leaves a countersunk portion for the drilling of the hole. The next operation is to remove the burrs from around the edge. This is done by a die through which the adjuster bolt is forced so as to clip off the burrs. The remaining operations are those of drilling the eye and cutting the threads.

Racks for Rail and Pole Storage

USUALLY rails, poles, special work and other bulky track and overhead material are stored in the open. No serious amount of depreciation follows from this practice, provided the material is kept off the ground where it does not lie in water or on damp soil.

In Mobile, Ala., the practice is followed of using old rail for making the horizontal pieces for these racks. The vertical members are stout posts. The accompanying view shows a rack made in this way for storing track rail and special work.



In Mobile Racks for Outside Storage Are Made from Old Rail

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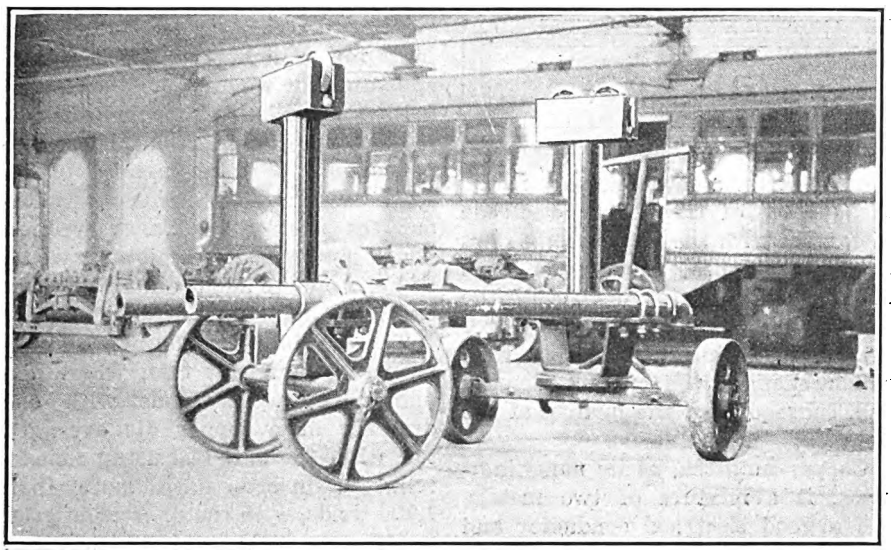


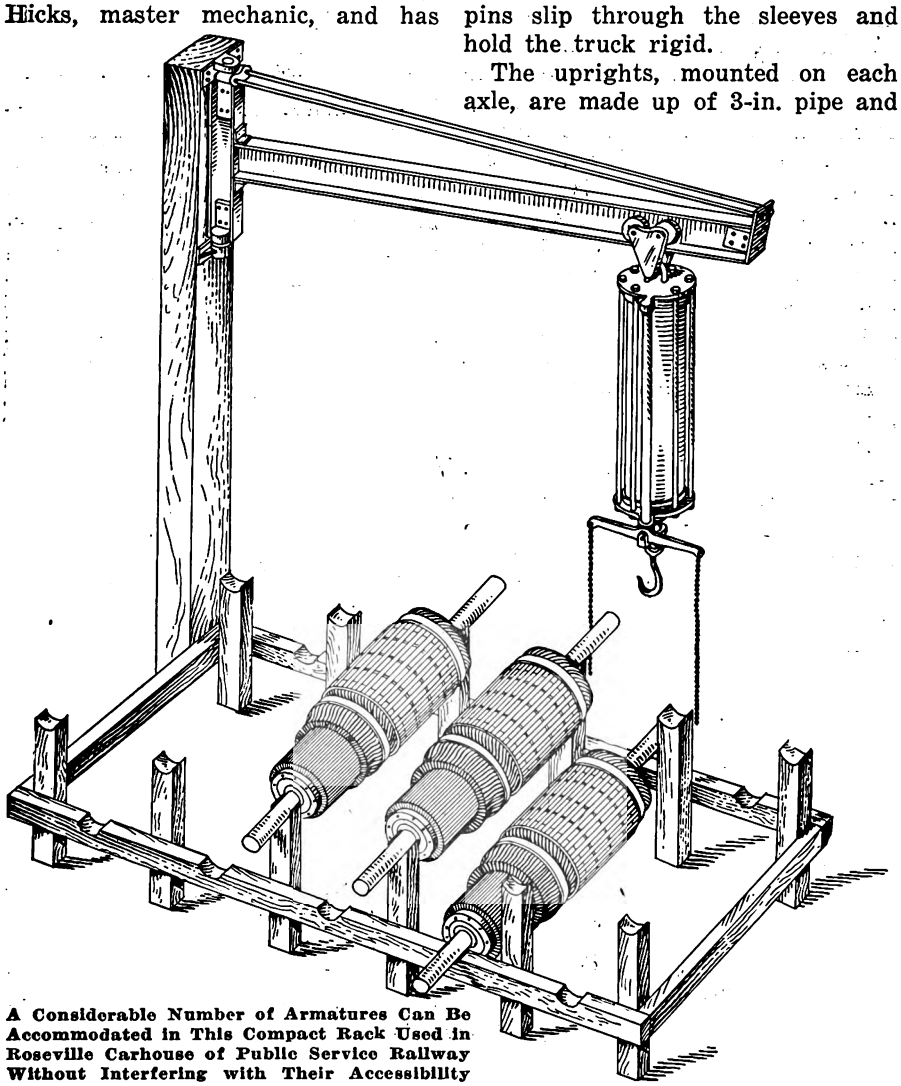
Adjustable Armature Carrier in Richmond

Adjustable Armature Carrier

CARRIERS for armatures in a variety of forms are common in electric railway repair shops, but the type used in the Richmond shops of the Virginia Railway & Power Company has a number of novel features. It was designed by W. J. Hicks, master mechanic, and has been found very convenient in transporting armatures in the shops from one point to another.

A feature of the carrier is that its length is adjustable. The side pieces are short sections of 2-in. pipe which are attached to the front two-wheel truck but slide in sleeves attached to the rear two-wheel truck to provide the adjustable feature. Dowel pins slip through the sleeves and hold the truck rigid.

The uprights, mounted on each axle, are made up of 3-in. pipe and the rests are ball bearings, which make the removal of the armature very easy.



A Considerable Number of Armatures Can Be Accommodated in This Compact Rack Used in Roseville Carhouse of Public Service Railway Without Interfering with Their Accessibility

Compact Armature Rack Serves Big Carhouse

FOR the storage of spare armatures at the Roseville carhouse of the Public Service Railway, Newark, N. J., a compact and convenient rack has been devised by Ben Singleton, shop foreman. From this carhouse 126 cars are operated, including six different types. These cars are equipped with motors of various makes, and consequently a considerable number of spare armatures must be kept on hand. A double-deck rack has been built in such a manner that a minimum of space in the shop is required, yet any armature can be taken out easily and quickly.

The rack consists of a rectangular wood frame and a number of 4-in. square posts. These posts extend about 6 in. below the frame, thus raising it from the floor, and extend about 2 ft. above the frame. Grooves have been cut in the tops of the posts to form seats for the armature shafts. Similar grooves have been cut in the sides of the frame midway between each two pairs of posts. Armatures are supported by the ends of the shafts which rest in pairs of grooves on opposite sides of the rack. The general arrangement of this device is shown in an accompanying illustration.

To the rear of the rack at one end is a jib crane equipped with a traveling air hoist. The crane arm extends over the entire length of the armature rack, and the traveling feature of the pneumatic hoist makes it easy to lift any armature and transfer it to a hand cart for transportation to the car where it is to be installed. The space between two armatures resting on the tops of adjacent pairs of posts is not sufficient to permit raising an armature directly upward from the frame below. In lifting armatures it is therefore necessary to carry the armature slightly forward until the core is clear of the two cores above. The armature can then be raised straight up as there is sufficient clearance for the shaft between the upper cores.

Should it ever be desired to increase the capacity of the rack, a new section could be built similar to the one now in use. By placing this in the same relative position on the opposite side of the crane, the air hoist would serve it as it does the first section.

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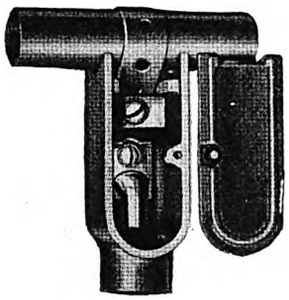
New Equipment Available

Condulet for Ground Wires

IMPORTANCE of a well-grounded system with wire thoroughly protected from mechanical injury is appreciated by the men responsible for electric car maintenance. To provide a condulet with necessary connections so that this can be installed readily, the Crouse-Hinds Company, Syracuse, N. Y., has just brought



New Condulet with Cover Removed to Show Strap and Lug

out its type GC condulet. This is provided with necessary tinned-copper grounding straps and lugs of ample size. The clamping means provided effect a rigid, mechanical and electrical connection between the condulet and the piece which serves as a ground. After the connections have been made, a cover incloses and protects the connections, but may be opened for inspection at any time without disturbing them. These condulets are furnished in three sizes, depending upon the size of ground wire used. These are GC 1 for ground wires No. 10 to No. 6; GC 2 for No. 4 to No. 1 wire, and GC 3 for No. 0 to No. 000 wire.

Copper Tungsten Electrode for Welding

COPPER-TUNGSTEN electrode, a development which is expected to prove of great value in the welding of metals, is now available. This announcement is made by the General Electric Company, Schenectady, N. Y., which evolved the new electrode.

One of the limiting features in many resistance or spot welding operations has always been the copper electrode used, the pure copper not being hard enough when used under the high pressures at high currents common to this type of welding. Usually, after a few welds are made, the surface of the copper electrode in contact with the weld becomes hot enough to anneal the copper, thus making it very soft. As a result, the copper tip rolls and mushrooms over the edges, giving a large spot weld which changes the current density and, consequently, the quality of the weld.

Copper-tungsten, as its name indicates, is a mixture of two metals, one a good electrical conductor and the other very hard. The alloy has a hardness of 225 (Brinell), as compared with 82 for hard copper and 30 for soft copper. The compressive strength of the copper-tungsten is 208,000 lb. per square inch, as against 58,000 lb. per square inch for hard copper. The tensile strength is 56,350 lb. per square inch, compared with 30,000 lb. for soft copper and 50,000 to 70,000 lb. for hard-drawn copper.

Copper-tungsten does not anneal at red heat. Thus there is no soft surface metal to roll or mushroom over when used in resistance welding. It has not been found necessary to form the entire electrode point or die of copper-tungsten, but rather to use inserts of this alloy by any one of a number of methods, such as forcing an oversize piece in a hole in the die, brazing a block in the wearing surface or placing pieces in a mold and casting the die around them. The remainder of the die is made of copper as before.

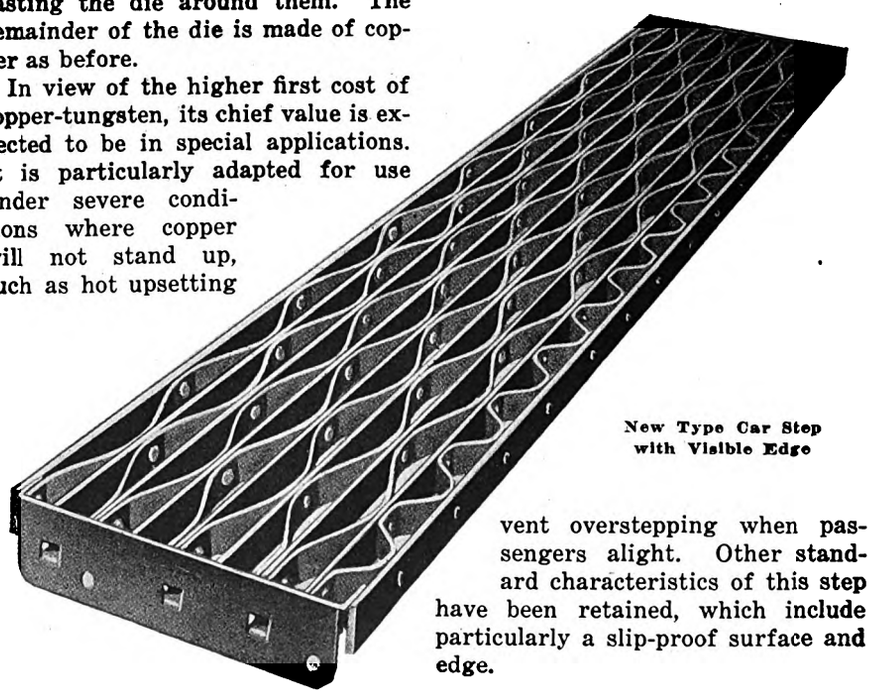
In view of the higher first cost of copper-tungsten, its chief value is expected to be in special applications. It is particularly adapted for use under severe conditions where copper will not stand up, such as hot upsetting rivets electrically, and in facings for clamps for rod welding, split dies for welding steel spokes to both rim and hub of steel wheels and in many other applications where copper cannot be used because of its softness. In such instances, without the use of resistance welding which is now made feasible, it would be necessary to adopt other and more expensive methods of fabrication.

The durability of the new alloy is shown by a recent test, where the number of welds made with one dressing of a copper die averaged ten, while the first test using copper-tungsten inserts gave more than 1,000 welds, with the die still in good condition at the end of the test. Other tests showed better results. It is therefore expected that the cost of changing the old copper electrodes and redressing them will more than pay for the larger first expenditure for copper-tungsten.

The material has been given the trade name Elkonite and will be manufactured and sold exclusively by the Elkon Works, Inc., Weehawken, N. J., of P. R. Mallory & Company.

Visible Edge on Car Steps

IN ORDER to make the outside edge of "Safesteps" more pronounced, the Irving Iron Works Company, Long Island City, N. Y., has brought out a new design in which the first bar next to the nosing has twice as many crimps as the other bars on the step. This has been added as a safety precaution to prevent overstepping when passengers alight. Other standard characteristics of this step have been retained, which include particularly a slip-proof surface and edge.



New Type Car Step with Visible Edge

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Association News & Discussions

Pennsylvania Street Railway Association Holds Valuable Meeting in Pittsburgh

Proposed Policy Discussed in Bus Application of Reading Railroad—Traffic Questions Treated in a Paper by the Traffic Engineer of Pittsburgh—A. W. Robertson Points Out Many Opportunities for Public Relations

ONE of the most fruitful meetings of the year was held in Pittsburgh on March 12 representing the annual convention of the Pennsylvania Street Railway Association. A. W. Robertson, vice-president of the Philadelphia Company, gave an inspiring talk on the opportunities in public relations, saying that such opportunities not only do not knock but once at our doors but almost hammer their way to our attention every few minutes. Every time a passenger drops a fare in the box such an opportunity exists. When an extra amount is dropped in accidentally the conductor of a Pittsburgh Railways car is permitted to make a cash refund, simply asking the passenger to sign a receipt for the amount returned.

Opportunities without number were cited by Mr. Robertson; the acceptance of many of such on the part of the railway he represents was responsible in no small part for the great progress made in recent years that culminated last October in the award of the Coffin Prize to the Pittsburgh Railways. Mr. Robertson, a lawyer by profession, is a public servant at heart.

Following President F. R. Phillips' address of welcome and the annual reports of the association officers the reports of the standing committees on legislation, policy and overhead lines were read by the respective chairmen, A. W. Robertson, C. L. S. Tingley and M. W. Cooke. Mr. Tingley discussed at length the memorandum proposed for submission on the part of the association before the Public Service Commission of Pennsylvania relative to the blanket application of the Reading Railway for bus operating permits in certain eastern Pennsylvania territory jointly occupied by the steam carrier and certain electric railways. The memorandum argues that the granting of such permits to the steam carrier would greatly deplete the revenues of the electric carrier and render it unable to perform its charter duties, inevitably ending in bankruptcy. Such a procedure would be tantamount to confiscation. "On the other hand," the memorandum asks, "would the refusal of such certificate so adversely affect the revenues of the steam carrier as seriously to impair its earning capacity? If the general contention of the steam carriers is true, as we believe it is, that passenger traffic on many branch lines is not only unremunerative but is actually conducted at a loss, the curtailment or even entire abandonment of passenger service on such lines should have a beneficial effect upon their net earnings, though somewhat reducing their gross.

The memorandum concludes with several principles that are offered as a basis for consideration of such permits; arguments were presented from the floor relative to the inclusion of the last principle and this was held open for later consideration on the part of the member companies:

Unnecessary duplication of transportation service is an economic waste to be avoided.

The service zone or territory of each established common carrier and earnings derived therefrom should be respected and protected, and no attempt made to duplicate existing service in any given territory or service zone where such carriers stand ready to furnish adequate service.

Transportation facilities in any given territory or service zone should be co-ordinated so as to give the public the best practicable transportation service without duplication.

Established rail carriers or their affiliated carriers should be given preference within their respective territory or service zones as to the use of public highways for motor coach routes where necessity for same exists.

In territory common to two or more steam rail carriers, priority of occupation and extent of traffic diversion should largely determine the order of highway preference as to the several steam rail carriers.

In territory common to steam rail and electric railway carriers, the electric carriers being entirely dependent upon local passenger traffic for their revenue should have prior right to the use of highways for motor coach service operated through their affiliated motor coach companies, for the motor coach is highly competitive with the entire business of electric carriers and is a similar transportation agency which should be utilized for the extension of electric carriers' routes and service and operated as a part of electric carriers' co-ordinated railway and motor coach systems.

In territory common to two or more electric rail carriers priority of occupation and extent of traffic diversion should largely determine the order of the highway preference as to the several electric rail carriers.

During the luncheon intermission a playlet was presented by employees of the Duquesne Light Company entitled "Investigation of a Fatal Accident."

P. H. Gadsden, vice-president United Gas Improvement Company, responded to the request of the chairman to give a short talk on the value of public utility service, saying in part that such a service must eventually win out because of the superior value of the service rendered to the public. It must perform and it must be frank with the public in telling its story.

Burton W. Marsh, traffic engineer for the city of Pittsburgh, told of the co-operation he had received in helping to solve the traffic problems of that city. More than 50,000 people are now transported daily in and out of the triangular downtown district on the cars of Pittsburgh Railways and are practically on time, whereas before the rerouting of such lines cars were generally from ten to fifteen minutes late. This has been accomplished despite the 50 per cent increase in motor vehicle registration in six years and despite the fact that traffic has increased lately 2.24 times as fast as the population. Intelligent parking regulation has helped in this accomplishment. Traffic fatalities have also been reduced from 154 in 1924 to 134 in 1925. Pittsburgh is one of the few cities of its size to have effected such a reduction.

Few traffic lights are used in Pittsburgh, as the officials are not agreed that an improvement could be made by adopting systems that have been developed so far.

John A. Dewhurst, associate editor ELECTRIC RAILWAY JOURNAL, in dis-

COMING MEETINGS OF *Electric Railway and Allied Associations*

March 23-25—National Conference on Street and Highway Safety, Washington, D. C.

March 25—New England Street Railway Club, 26th annual banquet, Copley Plaza Hotel, Boston, Mass.

March 29-31—National Conference on City Planning, St. Petersburg, Fla., April 1—West Palm Beach, Fla.

April 2—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8:00 p.m.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

April 23—Metropolitan Section, American Institute of Electrical Engineers, Engineering Societies Building, New York City. 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

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cussing Mr. Marsh's paper, described the system of traffic control of Chicago's 49 intersections in the loop. He said that observations during the first month of their operation indicated a greatly increased speed of cars and vehicles and a consequent reduction of congestion. The system on which the light signals were operated was not synchronous but co-ordinated, the time relationship being calculated from innumerable time studies of car and vehicle movements made by engineers of the Chicago Surface Lines.

A paper by R. H. Horton, president Philadelphia Rural Transit Company, was read in which Mr. Horton discussed the co-ordination of bus operation with present transportation facilities. This paper will be abstracted in an early issue of ELECTRIC RAILWAY JOURNAL. A reel of motion pictures illustrating Philadelphia's bus operation was shown following the reading of the paper.

Walter Jackson, in discussion, described early European bus operation and its development in certain European cities, stating in part that the gas-electric bus was an early feature in some of these installations.

Following the association dinner Hon. Richard W. Martin, newly appointed member of the Pennsylvania Public Service Commission, discussed the Pittsburgh contract under which the Pittsburgh Railways emerged from receivership two years ago. Following Mr. Martin, Thomas Fitzgerald, vice-president of this company, delivered an address, carrying his hearers through the six years of operation by the court, during which time only 150 new cars were purchased. Without the Pittsburgh contract and the partnership provisions it contained it would not have been possible to borrow the $5,000,000 necessary for rehabilitation at the time of the receiver's discharge.

Never was a street railway more liberally treated and never was there such co-operation exhibited than since the start of operations under this agreement. Since the receivership 328 new cars have been purchased, 50 miles of tracks have been rehabilitated, new signals have been installed and trainmen's quarters in ten stations have been opened.

The weekly pass has made possible greater service to the people of Pittsburgh, if not greatly increased revenues. Lessened gross revenues last year were not caused by the use of the pass, according to Mr. Fitzgerald, but were the result of industrial conditions. He stated, however, that there was not complete unison of opinion regarding this point by all officials, but that it was certain the increased usefulness to frequent short-rider patrons was a distinct asset to the company.

The same officers were re-elected, adding J. L. Adams, president and general manager Philadelphia & Western Railway, as second vice-president of the association. J. J. Coleman, general manager Scranton Railway, was elected to the executive committee to fill the position of Mr. Adams. The new officers for the coming year are: President, F. R. Phillips, Pittsburgh Railways; vice-president, W. S. Bell, Wilkes-Barre Railways; secretary, Harold A. Buch; treasurer, C. F. Crane, Harrisburg Railways. The new executive committee consists of C. L. S. Tingley, American Electric Power Company; Thomas Cooper, Westinghouse Electric & Manufacturing Company; C. F. Crane, Harrisburg Railways; J. J. Coleman, Scranton Railways; H. L. Mitchell, West Penn Railways; J. E. Wayne, York Railways, and W. A. Woolford, General Electric Company.

There were 148 registered at the meeting and 174 attended the dinner.

Attendance at A.R.E.A. Convention Shatters Previous Records

Committee Reports at Chicago Bring Out Many Points of Interest—Meetings of Signal Section and of National Railway Appliance Association Are Also Held—Many Exhibitors in Coliseum

ONCE again the American Railway Engineering Association broke all previous records for attendance at its annual convention held in Chicago March 9 to 11. Final registration figures for this 26th annual meeting showed a total of 831 members and 199 guests, or a combined total of 1,030. Sessions were held morning and afternoon of each day, the time being largely devoted to the hearing of committee reports and to limited discussion of the same. Due to the extensive nature of these reports, the committees were requested to abstract them as much as possible, in order that more time might be available for discussion. There is considerable feeling prevalent in the association that some means must be found for providing additional convention time, possibly through the addition of a fourth day to the convention period.

The annual dinner was held on Wednesday evening, at which time E. W. Beatty, president of the Canadian Pacific, presented a very interesting talk on "The Engineer." A number of other important addresses were also given. So great was the interest shown in the banquet that the total possible reservations were exhausted, and several people had to be turned away.

It was considered advisable to shift the time for holding the meetings of the Signal Section, A.R.A., to the day before and the first day of the American Railway Engineering Association convention rather than scheduling them for the day following the close of the convention proper. This was because the two bodies had so much in common that it was felt advisable so to arrange convention dates that a maximum amount of joint attendance would be possible.

The National Railway Appliance Association held its eighteenth annual exhibition in the Coliseum on Monday, March 8. The exhibitors this year totaled 188, compared with 176 last year. Displays of railway materials and devices were more elaborate than ever before.

PRESIDENT FAIRBAIRN OUTLINES SCOPE OF THE ASSOCIATION

Believing that a more uniform effort should be made to encourage membership in the American Railway Engineering Association, in order to equalize to some degree the corporate and geographical distribution of the membership, J. M. R. Fairbairn, chief engineer Canadian Pacific Railway, pointed out in his presidential address the manifold activity carried on by the association and the very real advantages to be derived from membership therein. Speaking of the work done by the 23 standing committees of the association and those special committees dealing with special assignments, he explained that the various subjects assigned to each committee are pertinent to the particular field which that committee covered and are selected carefully by the outline of work committee and the board of direction, after fullest co-operation with the committee chairman in each case. It is intended to cover in any one year only those subjects which are most urgently in need of analysis and solution by the railways.

At the Wednesday afternoon session C. F. W. Felt, chief engineer Santa Fé system, was elected president of the association for the ensuing year. He was installed on Thursday afternoon at the conclusion of the presentation of the committee reports. At this time J. L. Campbell, past-president, presented Mr. Fairbairn with a silver loving cup in behalf of the association in appreciation of his services to the organization.

W. B. Murray, vice-president of the Murray Train Control Corporation, became president of the National Railway Appliances Association for the ensuing year. A. H. McKeen, signal engineer Union Pacific System, was elected chairman of the Signal Section, A.R.A.

Some of the more important points covered in committee reports which may be of interest to electric railway men are given here:

ECONOMICS OF RAILWAY LOCATION

Economics of railway location is affected by the introduction of electric locomotives, according to the report of this committee. The principal economy to be effected by the introduction of the electric locomotive for a projected railway line lies in the modification of the ruling grade, it being possible to follow more closely the natural topography of the country. Unless the country were level in character less linear curvature would be possible, shortening the total mileage of the system accordingly.

Characteristics of Electric Locomotives—Maximum tractive effort which may be exerted by an electric locomotive is dependent upon the weight on drivers and may be maintained from zero speed up to some speed determined by the motor characteristics. The tractive effort is uniform at any given speed, decreasing as the speed increases, and always has a definite relation to speed, depending upon the characteristics of the motors used.

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Availability of Motive Power—It has been demonstrated by the electrified railroads of this country that electric locomotives can be operated at greater distances from repair shops and for longer periods between shopping for inspection or overhaul than steam locomotives, due to the lesser necessity and the greater ease of making renewals to electric locomotives. This feature of the electric locomotive should affect the economics of railway location in that terminal facilities for turning of locomotives, inspection and repair can be located at the most economic point and raw supplies and labor more readily and cheaply obtained.

The committee wishes to draw attention to the consideration being given at the present time to the internal combustion engine in the form of a prime mover for locomotives, which, in combination with electric drives, makes an independent unit with some of the desirable characteristics of the electric locomotive and without the attendant disadvantages of transmission, distribution and conversion equipment. The introduction of this type of electric locomotive will affect railway location and these locomotives can carry sufficient fuel and other supplies for a six to seven-day run.

Iron and Steel Structures

The committee recommended that report on instructions for maintenance inspection of superstructures of steel bridges be approved for publication in the Manual. These instructions are for the guidance of inspectors in the maintenance inspection of steel railway bridges. Inspectors will be held responsible for the performance of their duties in accordance with these instructions. They shall make a complete detailed inspection of every bridge and shall report indications of overload or failure in any part of the bridge. They shall observe the behavior of the bridge during the passing of live load if practicable, noting excessive vibrations, deflection, and side sway.

Shops and Locomotive Terminals

With regard to storehouses for shops and locomotive terminals, the committee reported that the primary consideration is the economical handling of material. The arrangement should be such as to insure ample natural light and the convenient handling, checking and inventorying of materials and ease of supervision. Racks should be so located that the handling of materials will be reduced to a minimum, so there will be no dark pockets for the accumulation of rubbish, etc.

The most general process is to place a rack transverse to the house, thus permitting natural light from side windows to illuminate the aisles and racks. Some railroads place the racks longitudinal to the house to permit freer observation of the force. On the other hand, this requires more artificial lighting and more floor space.

Track facilities should be provided for the receipt of incoming materials, for the loading out of materials, for distribution to other points in the shipment of scrap. Paved roadways should connect the storehouse to a public highway and all parts of the shops and terminals served by the storehouse. These roadways not only serve in the distribution of materials but also provide easy access for fire apparatus.

Electricity—Specifications for Track and Third Rail Bonds

The work of the sub-committee this year has been confined largely to securing and tabulating data covering the latest bonding practices being used in steam railroad electrifications in the United States and Canada. It will be noted that track rail bonding as well as third rail bonding practice varies widely even where conditions that affect the selection of bonds are similar. Reliable data covering the relative merits and performance of the different types of bonds are lacking.

Track Rail Bonding

There are two general classifications of bonds in use, (a) mechanically applied bonds to web of rail and (b) heat applied bonds to head of rail. The advantages and disadvantages of a mechanically applied type of bond may be summed up as follows: *Advantages*—Ease of installing. Wide range in choice of length of bonds and flexibility of designs to suit rail joints. Low labor costs of application and replacements. Small and inexpensive installation tools. *Disadvantages*—High first cost. Necessity of being designed to suit the rail joints, the length being fixed by splice bar and bolt hole safety. Larger capacity than otherwise necessary when long lengths are used. Uncertainty of securing and maintaining uniform and low contact resistance unless special care is taken to insure proper application and maintenance.

Advantages and disadvantages of the welded type of bond may be summed up as follows: *Advantages*—Low first cost to install. Low resistance due to short lengths and character of contact. The use of small capacity bonds, all being of 250,000 circ.mil or less. Easily inspected. Uniformity in design. Permanency of contact and consequently permanency of contact resistance provided the weld holds. *Disadvantages*—Skilled operators required for installation. Special tool equipment which is more or less cumbersome. Exposed to mechanical injury of several kinds. Exposed to theft. Limited resistance to fatigue stresses on account of short lengths. Expensive to replace, particularly when only a few applications are to be made. Limited to rail head applications. Possibility of starting detail fractures in rail due to heat necessary in application.

Third Rail Bonding

Due to the different kinds and shapes of third rail in use, the third rail bond must necessarily be of more or less special type and the design must be adapted to the type of rail with which it is used. There are eight installations comprising four mechanically applied types of bonds and four heat applied. Of the mechanically applied, three are of the compressed terminal type and one the pin expanded terminal type. Of the heat applied bonds, two are gas welded and one electrically welded and one of the standard type. Comparatively little opportunity is offered at present for standardization of third rail bonding practice because of the widely differing types of third rail construction.

With respect to thermit welding, practically nothing has been done in the steam railroad field with the exception of an experimental installation in third rail work, although this type of welded joint is widely used in the street railway field for running track.

Signals and Interlocking

Arguments for and against the location of warning signals in the center of the road rather than on the right side of the road are listed. Uniformity is needed, not only of signals but of their location, but in the committee's opinion this cannot be secured. Each location should be given special study. With the highway curving sharply to the right, in some cases in spite of interference of lights from opposing automobiles and even the cars themselves, it will be best located on the left side. If the roadway and surroundings are well illuminated as in city streets, and especially if the city traffic signs are in the center of the street and people are accustomed to look there for them, the center of the street is the place for crossing signals also.

In the open country where power is not available to furnish extraneous lighting, as is the case in the majority of country roads and even on state highways, and where drivers are accustomed to look to the right side of the road for information, signals should be located on the right of the highway so as to be seen by those who seek them there.

Perhaps as good a rule as any to advocate would be to locate the signal in the center of the street if the street is wide enough so that this can be done without great expense when assured that the local people will not require floodlighting or illuminating it to give a Christmas tree effect; otherwise it would be best to locate the signal on the side of the road. Second, uniformity in the matter of painting, both as to color and the form it should take, might be attainable. Third, it certainly should be possible to present a united front on the desirability of eliminating advertising signs in the vicinity of railroad crossings, especially within the zone limited by the approach signs at 300 ft. or 400 ft. beyond the crossing. Also, against the use of fixed red color lights under signals located in the highway.

Ballast — Revised Rules Pertaining Thereto

Rule 790—The object of ballast is to secure a solid and uniform bearing for the ties, distribute the applied load over a large surface, hold ties firmly in position, give elasticity to the track, and allow the water to pass off freely.

Rule 791—Before distributing ballast, the roadbed should be carefully prepared with embankments and cuts widened to conform to the standard plan. Track must be kept in good line and surface while ballasting and stakes should be set for this purpose. The ballast program should be so arranged and the supply so regulated as to leave the least possible open track during the progress of the work, with no open track when the season closes.

Rule 792—Where directed by the

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division engineer, preparatory to the distribution of new ballast, all the old ballast and unsuitable material must be removed to the bottom of the ties for the full width of the roadbed, the old ballast cleaned and the material unsuitable for ballast used for widening embankments or other purposes. At the same time all ties requiring renewal should be replaced and the ties properly spaced.

Rule 795—In gravel or broken stone ballast the ties should be tamped solid from 15 in. inside the rail out to the ends. The space under the rail should be tamped well. The center of the tie should not be tamped.

Rule 796—Where the track is electrically bonded, the ballast must be kept at least 1 in. below the base of rail. At road crossings and platforms where this is not practicable, the rails should be insulated by painting them with an asphaltum or tar product, and good clean stone mixed with the same material should be used for at least 1 ft. each side of the rail.

Economics of Ties

In preparation of service tests, it is necessary, first, to determine the object of the test and then the test practice can be devised. Considerations of the elements of testing tie life or service led to selecting the following subjects which should be considered in formulating test practices and records: (1) Relative advantages of the different sizes of ties. (2) Results with different intensities of traffic, other variables being the same. (3) Relative advantages of different kinds of preservative treatment. (4) Advantages of pre-boring and pre-adzing ties for treatment. (5) Relative economies of large and small-sized tie plates. (6) Determination of density of traffic which makes use of tie plates economical. (7) Relative economy of crossties 8 ft. long compared with ties 8 ft. 6 in. long, under different traffic and ballast-conditions. (8) Relative values of different kinds of wood. Recommendation of the committee that the report be accepted as information was accepted by the convention.

Wood Preservation

Among the outstanding problems concerning wood preservers has been the treatment of Douglas fir, the extent of its use making it an appropriate subject for attention on the one hand and its resistance to treatment presenting a real obstacle on the other. The committee has made some very complete investigations on this subject and felt justified in presenting specifications for the treatment of this type of timber. The committee also undertook the carrying on of marine piling investigations. Being restricted by lack of available funds for research and being under the necessity of working entirely with contributed services, the committee found itself unable to continue the extremely valuable biological work which had been previously carried on by the National Research Council.

Wooden Bridges and Trestles

This committee's report took the form of four appendices. Appendix A comprised a brief statement concerning changes in the Manual, none being offered. Appendix B embraced a large amount of material relative to the simplification of grading rules and classification of timber and lumber in railway uses. Appendix C contained a report on the value of treated timber in wooden bridges and trestles. Appendix D constituted the results of a study in the classification of the uses of timber and lumber on the railroad, and took the form of tables giving the recommended grades of lumber to be used in various types of wooden bridges, buildings, tanks, fences, culverts, etc.

Economics of Railway Labor

Of particular interest was the report on standard methods for performing maintenance of way work and the establishment of units of measure of work performed; the extent to which it is practicable to stabilize employment in the maintenance of way department in the interests of efficiency; economy in the use of labor-saving devices; and education and training of maintenance of way employees. It was the conclusion of the committee, in connection with the investigations of standard methods of performing maintenance of way work, that it is not possible to determine a fixed unit of cost of maintenance of way and structures account for any unit of property, such as the equated mile, or for any unit of use, such as 1,000 car-miles. It stated the conclusion that it will be impossible to determine upon such unit of cost at any future time unless all railroads were to adopt the use of standard materials and standard practices, and even then there would exist differences reflecting the differences in location, climatic conditions and physical construction.

Signs, Fences and Crossings

The committee reported concerning proposed revisions of the Manual, methods of apportioning the costs of highway improvements adjacent and parallel to railroad rights-of-way; the elimination of highway grade crossings and the use of natural rock asphalt as the substitute for planking in road crossings. The revisions of the Manual included a revision of the highway crossing sign and of the present bridge sign, various minor corrections and revisions intended to cut down the amount of space devoted to tables and illustrations and revision of the specifications of bituminous crossings.

Rails

The committee presented a recommended design for track bolts, including corresponding joint bar hole. This design accords with the recommended design presented last year as a progress report, with the exception of revised dimensions and radii of the shoulder of the elliptical track bolt. As now presented, the design shows optional properties for contour of shoulders, type of thread and periphery of nuts. The committee believes that this design meets conditions existing on the majority of American tracks for renewals and may be adopted generally for new construction. Manufacturers of track bolts have approved the design.

Statistics and data on rail failures, transverse fissures, relation of bolt tension to mechanical strength of joint, rail battering, the welding of traction and signal bonds, rail canting and specifications for spring washers and for girder rails were presented. On the latter point, the committee stated that while the girder rail is used only by steam railway lines in pavements through city streets and will probably never aggregate more than 100 miles, still it has seemed wise to co-operate with the American Electric Railway Engineering Association in revising its standard to conform as closely as possible with the steam T-rail standard in metallurgy and mechanical requirements. The specification has been ratified by the American Electric Railway Engineering Association, and adoption of it by the American Railway Association sets a common standard.

Track

Among the subjects covered by the committee in its report were detail plans of switches, frogs, crossings, including plans of self-guarded frogs; methods of determining recommendations for rail renewals; cause and prevention of rail battering; principles of rail joint construction; use of nut locks for rail joints with special reference to heat-treated bolts of large diameter; plans for tie plates. The sub-committee on detail plans of switches, frogs and crossings offered Plan No. 778 of manganese steel insert crossings, steam railroad over electric railway, angle below 45 deg. to 40 deg. inclusive, for adoption as recommended practice. This plan is to complete the series of plans of crossings of steam railroads over electric railways. Solid manganese construction for steam railroad over electric railway crossings is recommended for angles 90 to 45 deg. as per plans No. 776 and No. 777, adopted in March, 1924. Manganese insert construction is recommended for angles below 40 or 45 deg. to 30 deg. as detailed on plan No. 778 now offered. For bolted rail crossings, steam railroad over electric railway, there are plans No. 716 and No. 717 for angles 90 to 30 deg. adopted in March, 1925. The committee recommends that crossings, steam railroad over electric railway, below 30 deg., particularly for narrow tread and shallow flange electric railway car equipment, be avoided.

In addition, in collaboration with the M.T.S. standardization committee, this plan was prepared in consultation with a number of the members of the committee on way matters of the American Electric Railway Engineering Association and that committee will offer it to the American Electric Railway Association.

Records and Accounts

The committee presented a report covering the following assigned subjects: (a) Methods and Forms for Gathering Recording Data for Keeping Up to Date the Physical and Valuation Records of the Property of Railways; (b) Feasibility of Reducing the Number of Forms Used in the Engineering and Maintenance of Way Department, Combining Forms and Simplifying Those Retained; (c) Comparison of Daily and Monthly Time and Material Reports.

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The News of the Industry

Management Contract Under Fire in Indiana

A contract existing between an operating railway in Indiana and a holding company domiciled in New York is criticised by the Indiana Public Service Commission in an order granting an increase in fares to the railway. The contract under fire is one by which the local company pays a percentage of gross earnings and expenditures for extensions and betterments of service to the New York company.

Clyde H. Jones, commissioner, denounced the contract as "a process for milking the patrons of the utility and directly obtaining an enhanced return on its investment." The order of the commission said in part:

> This contract is similar in its terms to certain license contracts which other foreign holding corporations have imposed on local operating utilities, but it goes much farther than any to which our attention has yet been called. Sooner or later patrons who are subjected to such contracts will become aroused and it will provide a splendid argument for those who insist on government and municipally owned utilities.

Tentative Franchise for St. Louis Nearly Ready

Mayor Victor J. Miller of St. Louis, Mo., discussed the new blanket franchise for the United Railways in an address before the St. Louis Chamber of Commerce. He stated that the draft of the franchise ordinance would be ready for publication soon. The Mayor says the new grant is to be a very inclusive document, designed primarily to see that the citizens receive the best possible service at a minimum cost. He believes it would be an excellent thing for the city to be in a position to lend its credit to the railway in the construction of subways. The city should retain absolute control of the character of service. There should be provision for a director of transportation.

Municipal Operation a Fizzle Again

New York City Loses $717,508 on Staten Island Operation—Since 1921 Loss on Trackless Trolley Has Been $346,232 on Five-Cent Fare—New Administration Wants Roads Privately Operated

TRACKLESS trolley operation by the city of New York on Staten Island has cost the city $346,232, that having been the loss from Oct. 13, 1921, to Dec. 31, 1925. Municipal operation of the lines of the Staten Island Midland Railway has cost the city $371,276, that being the deficit on a 5-cent fare from Jan. 1, 1921, to Dec. 31, 1925. This is a total loss to the city of $717,508 on the two operations.

As a result of the studies made abandonment by the new city administration of municipal operation of the trackless trolleys and Midland Railway surface lines on Staten Island and of the surface line across Williamsburg Bridge are foreshadowed.

The Williamsburg Bridge operation has never been profitable to the city and a return to operation of the cars by the B.-M. T. and the Brooklyn City Railroad was advocated during the closing days of the Hylan administration.

That the city, in addition to its loss of $717,508 on the operation of trackless trolleys and surface lines on Staten Island, faces an additional loss on damage suits was disclosed by Comptroller Berry, who said that claims aggregating $120,000 had been filed against the city and that a reserve of only $3,056 had been established.

Examinations previously made of the affairs of the trackless trolley system have been continued under Mr. Berry's direction and show the following situation to exist:

An operating deficit for the entire period of more than $300,000; that the cost of transporting each paying passenger was 12.19 cents and that this cost was about 10.42 cents with a charge for depreciation excluded. To this must be added the amount that must be ultimately recovered for damages, claims having been filed for approximately $120,000, of which a judgment has already been entered and paid amounting to $11,334.35. A reserve of only $3,056.72 has been set up during the entire period to offset these claims for damages.

In a previous report on the conditions of the trackless trolley system on Staten Island covering the period from Oct. 14, 1921, to March 14, 1923, it was estimated that the cost of transporting each passenger was 10.27 cents. The increase in cost from 10.27 cents per passenger to 12.19 cents for the entire period covered by the present report is due in part to the increase of operating expenses, those for 1925 being approximately $5,000 a month in excess of preceding year.

For various years from Jan. 1, 1923, the cost of transporting each passenger was as follows: 1923, $0.1251; 1924, $0.1213; eight months of 1925, $0.1218.

Operating revenues for the entire period were $210,399.54 as against operating expenses of $512,639.91, leaving a net deficit of $302,240.37.

The examination conducted by the Department of Finance shows a total of 4,228,987 paying passengers carried for the entire period, this total being divided between 5-cent fares for adults and 3-cent tickets for school children. There was free transportation for 10,950 employees, making a grand total of passengers carried of 4,239,937.

On the occasion of the publication of a previous report by the Department of Finance the contention was raised in some quarters that admitting there was a loss in operating the trackless trolleys the transportation facilities afforded by the city had resulted in opening up a large undeveloped territory to home sites; that the increased assessed valuations of real property in the territory affected and the consequent increase in the city's revenues from taxation would ultimately offset the losses. Of this Mr. Berry said:

> This contention has not been borne out, nor is there any likelihood that the increase in population in the territory affected ever will be such as to put the present transportation system on a self-supporting basis.

The Board of Estimate appropriated $83,000 for the purchase of trackless trolley cars and the installation of overhead equipment on April 1, 1921, and operation of two lines was begun Oct. 13, 1921. On Nov. 18, 1921, the board appropriated $10,000 to serve as a "revolving" fund for operation, and on Dec. 8, 1922, a second $10,000 for the same purpose. In the meantime, on Dec. 16, 1921, the board appropriated $192,700 for the establishment of a trackless trolley line from Richmond, the terminus of the Richmond line of the Midland Railway, to Tottenville. On Oct. 5, 1923, the board added $30,000 to the revolving found.

In the fall of 1923 the board decided to include in the tax levy budget the funds considered necessary for the operation and maintenance of the trackless trolley lines and provided $128,678 for this purpose in the 1924 budget. It pursued the same policy for the succeeding years and put $118,551 in the 1925 budget and $107,930 in the budget for 1926.

An estimate of the cost of operation follows:

Expenses to Dec. 31, 1923, includes special revenue bonds—receipts for passengers, etc., from books of Department of Plant and Structures	$153,821.26
General fund	60,924.16
From tax levy budget funds, 1924.	128,677.71
From tax levy budget funds, 1925.	112,344.53
Claims paid by Finance Department on account of accident	11,334.35
Reserve for claims, accident and damages estimated	10,000.00
Interest on corporate stock, 1923, 1924, 1925	41,365.21
Interest on corporate stock to Dec. 31, 1922, estimated	10,000.00
	$528,067.22
Less materials on hand	38,699.55
Total estimated cost of operation and maintenance, exclusive of depreciation	$489,367.67

Records of the Plant and Structures Department give the cost of equipment and construction for the trackless trolley lines as $275,224. In their

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report to Commissioner Goldman his engineers have estimated depreciation at 33⅓ per cent, or $91,740. This added to $480,367, the estimated cost of operation and maintenance exclusive of depreciation, would make the total cost of operation and maintenance $581,107.

After the bankruptcy of the Staten Island Midland Railway Company the city, through the Department of Plant and Structures, began operation of its six lines with a total mileage of 41 on Dec. 1, 1920.

The balance sheet of the municipal operation of the Midland surface lines, from Dec. 1, 1920, to Dec. 31, 1925, follows:

Special revenue bonds (revolving fund)	$160,000.00
Receipts — Passengers, advertising, etc.	2,171,907.79
General fund	145,924.02
Taxes—Payable by Department of Finance (estimated)	86,627.63
Interest corporate stock, Department of Finance (estimated)	76,592.45
Accidents and damages, Department of Finance (estimated)	50,000.00
Paving by Borough President of Richmond	117,797.21
	$2,808,848.10
Bills payable (no funds available)	120,073.69
	$2,928,921.79
Credit—Cash, materials, supplies, etc.	42,989.75
Total (not including cost of cars)	$2,885,932.04

The deficits in operation of the surface lines, as reported by the engineers, amounted to $3,316.55 for the six months ended June 30, 1921; $49,191.31 for the year ended June 30, 1922; $35,099.27 for the year ended June 30, 1923; $84,848.53 for the year ended June 30, 1924; $103,595.71 for the year ended June 30, 1925, and $104,690.07 for the six months ended Dec. 31, 1925. Deducting $9,464.98 received from the sale of old material, the total deficit on the operation of the lines up to Dec. 31 last was reported to have been $371,276.76.

BUS LINES SUGGESTED

Discontinuance of city operation of the lines and the establishment of bus routes have been recommended by Edward A. Byrne, chief engineer of the Department of Plant and Structures. He said:

The receipt for the nine months ended Dec. 31, 1925, were only sufficient to pay salaries and wages, and the city owed on Dec. 31, 1925, about $110,000 for power, materials, supplies, hire of cars, etc. The city-owned cars are in such poor operating condition that this department found it necessary to hire cars from the Richmond Light & Railroad Company to operate during rush hours, and bills unpaid to Dec. 31, 1925, for this service amount to $14,460.

If the city decides to continue the operation as a permanent enterprise it will be necessary for the city to appropriate funds to an amount of from $1,500,000 to $1,750,000 to purchase new cars, install new track for part of the system, purchase a substation and a carhouse site, reconstruct the carhouse and acquire any rights that the railroad company may have. If this be done a rate of fare must be fixed taking into consideration all the above stated facts.

As a business proposition purely, putting aside the service that the people of Staten Island expect who have purchased property and live in the territory served by the city operated cars, the writer would recommend that this department cease operation of this road and the Board of Estimate and Apportionment grant franchises for the operation of buses along the routes now operated by this department.

Facts on New York Buses Disseminated

Railway Managements and Director Storrs Spread the True Story—Newspaper Co-operation Being Secured—Some Hints on How Others Have Done It

NEWSPAPER editors throughout the country are learning first-hand from their electric railway managements that the surface car in New York is not going to be supplanted generally by buses. Not only has the ELECTRIC RAILWAY JOURNAL discussed the matter at length, but armed with an authorized statement, prepared under the direction of Managing Director Storrs of the American Electric Railway Association, explaining the situation, the managements are getting in direct contact with their editors and rapidly correcting the original misleading story.

The statement, released through the association, follows:

Submission recently of a plan to substitute buses, at an increased fare, for 200 street cars in New York, which have been unprofitable under a 5-cent fare, has led to erroneous conclusions. The chief of these is that "this proposal marks the beginning of the end of surface lines in New York City."

The facts do not warrant this assumption or anything like it. What has happened is simply this:

For some years the New York railways has been operating street cars on the 25 miles of track involved at a loss under the 5-cent fare. Recently it arranged with the Fifth Avenue Coach Company to propose to the city that buses be substituted, under a 5 and a 10-cent fare arrangement, for street cars on the present unprofitable 5-cent lines. The short cross-town rides would be 5 cents, but the longer up and down town rides 10 cents.

Compared with the city's total riders, the number affected by the proposed change would be small. Passengers carried on the 200 cars in 1925 represent about 4 per cent of the city's surface lines total of 1,035,977,724 revenue riders. This is 36 per cent of all electric railway pasengers. Subway and elevated lines carried 62 per cent, or 1,680,800,254 passengers.

Various individuals and groups have hailed this proposal as marking the obsolescence of the trolley. It is nothing of the kind. This suggestion is simply another move to carry out the definite policy of the American Electric Railway Association and the local transportation industry generally.

That policy is to render service either by electric railways or buses, and particularly to supplant non-paying lines with buses at a rate of fare which will insure fair earnings. There have been similar replacements proportionally as great elsewhere in the past, but invariably the electric railway has remained the backbone of the system.

Incidentally, it should be remembered that in New York subways provide the backbone of service and all other means of transportation are necessarily of a supplemental character. In most cities the local electric railway is the main artery of transportation, as in the subway in New York. To talk of doing away with surface lines in most cities is equivalent to talking abandonment of subways in New York. And that isn't being done.

Attempts made in London to substitute buses for street car service have failed. When the point was reached where buses were carrying 40 per cent of local downtown traffic the congestion became so great that it was necessary to eliminate many of the buses.

The New York *Times* summarizes the situation so far as it affects Manhattan Island very clearly in an editorial which says in part:

"There is danger of the opinion establishing itself that the surface car in Manhattan is an obsolescent institution of little practical value, the sooner got rid of the better. In 1925 the surface cars in Manhattan carried 354,000,000 passengers. This was 2,000,000 more than traveled on the elevated lines and nearly half the number carried on the Interborough subway lines. Obviously the surface car is a problem of considerable dimensions.

"From that point of view the question of fares becomes of outstanding significance. The new plan calls for a 10-cent fare on the longitudinal routes. That same fare, it must be assumed, will be asked whenever the extension of the bus routes to the entire city is effected, if ever. If such a fare is justified, it would be a virtual admission that the bus is much more expensive than the trolley car. This would confirm the general deduction from the fact that gasoline power threatens to become more and more costly with time, while electric power tends to develop in the opposite direction. In any case the establishment of a 10-cent fare is not a matter to be lightly disposed of in a community which has fought historic battles over the 5-cent fare in the subways."

Predictions that the trolley is doomed to pass have appeared many times in the past and doubtless will appear in the future. Yet these salient facts stand out:

Bus rides cannot be provided as cheaply as electric railway rides.

Every attempt in this country to motorize a city of more than 50,000 persons has failed.

Informed transportation minds everywhere agree that the best local transportation service is provided by electric rail service supplemented by buses.

In addition to supplying all companies, both operating and manufacturing, with this authorized statement, the association prepared it in leaflet form and it is now being widely distributed. Among others who have received the statement are all newspapers in the country, all financial editors, investment bankers, state committees, libraries, universities and schools, state and city officials.

One of the first railways to use this material to advantage was the Montreal Tramways. Both English and French papers published stories exposing the weaknesses of the claim that cars were to be supplanted.

The Chicago *Daily News*, in an editorial, pointed out clearly the impossibility of buses supplanting the surface lines.

The Philadelphia *Public Ledger* and the New York *Evening Post* took cognizance of the situation in their financial pages.

Walter A. Draper, president of the Cincinnati Street Railway, and Hudson Biery, commercial manager, were quick to sense the timeliness of the topic. Mr. Biery delivered a talk to a local club and later the Cincinnati papers published more than half a column about his remarks.

These are only a few specific instances of getting the correct story before the public through executive co-operation. There have been and will be many others.

Managing Director Storrs paid particular attention to the situation in a speech at Providence, R. I., and another at Springfield, Ill. The Providence speech was productive of much local publicity. The Springfield address was delivered before the combined utility associations of Illinois. It was carried in advance by large press associations and newspapers.

The statement recently sent out is available through the association in leaflet form, but there also is much more than that available. The association, the ELECTRIC RAILWAY JOURNAL, other trade publications, speakers and others have discussed the subject thoroughly during the last five years.

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Seven-Cent Fare in Chicago Stands

Chicago's 7-cent fare, in effect on the surface railways as a temporary compromise since June, 1922, has been approved by C. B. Morrison, federal master in chancery. The 6-cent fare ordered by the Illinois Commerce Commission in 1922 would be confiscatory, the master reported by implication. He said also that the 8-cent fare previously effective was too high. His report recommended continuance of the 7-cent compromise. In ordering the fare reduced to 6 cents the Illinois Commerce Commission attempted to force the Chicago Surface Lines to reduce the wages paid to trainmen and the salaries paid to officials, the master said. The commission failed to prove that wages or salaries are excessive. The report will make worthless the hundreds of thousands of transfers car riders have been saving since 1922 under a court ruling that made transfers legal fare receipts. Had the 6-cent fare been upheld the transfers would have been redeemable for 1 cent each. It is expected that Federal Judge Wilkerson will approve the finding.

Valuation Finding at Baltimore Attacked by People's Counsel

Clarence W. Miles, people's counsel, has appealed to the Circuit Court at Baltimore from the recent decision of the Maryland Public Service Commission placing a valuation of $77,000,000 on the property of the United Railways & Electric Company, Baltimore, which amount includes an allowance of $7,000,000 for easements. He asks that the opinion and order passed by the commission be vacated, annulled and set aside. During the hearings Mr. Miles opposed including the easements in the valuation. Two of the three members of the commission, however, after receiving an opinion from the Attorney-General of the state, included the easements. The third member, J. Frank Harper, agreed with Mr. Miles and filed a minority opinion in the case. Mr. Miles said the so-called easements constitute a mere right in common to use the streets and are in no sense property or such an interest in land or property as to permit their capitalization or evaluation for rate-making purposes. The court issued an order requiring an answer by April 7.

New Franchise Need in Louisville Explained

James P. Barnes, president of the Louisville Railway, Louisville, Ky., and its subsidiary, the Kentucky Carriers, Inc., went before the Board of Works on March 11 and outlined expansion plans over the next ten years. He argued for a new franchise contract with the city, based on a broader term, enabling the company to secure earnings which would make it possible to interest capital and provide funds for necessary expansion. Mr. Barnes discussed plans calling for about 45 miles more of track, about 70 cars, additional buses, and equipment to a total of $8,500.000.

In 1930 the company must refinance a first mortgage of $6,000,000; and in 1932 a second mortgage of $2,000,000, and it may be necessary to pay interest for this money higher than is now paid, due to the present ordinance, limiting earnings to a point where investment would not appear attractive. Extensions costing about $350,000 are needed now in the suburban section.

The company is now collecting a straight 7-cent fare under a sliding or barometer scale arrangement.

Charles L. Craig Holds Option on Certain New York Lines

Charles L. Craig, former comptroller of New York City, now holds an option on the franchise and trolley tracks of the Fourth and Madison Avenue lines running from the old Post Office at City Hall Park to the Harlem River. The option was obtained six days before the so-called "mystery" bill was introduced in the Legislature at Albany to give New York City the power to acquire any surface car line and remove its tracks from the streets. Mr. Craig said that he felt the city should have the chance to acquire the property but that he and his associates were prepared to modernize the trolley lines and continue operation at a 5-cent fare. The Craig bill was criticised in Albany on the ground that it might be considered a "grab."

Relief Sought in Sioux Falls

In accordance with present plans the fate of the Sioux Falls Traction System, Sioux Falls, S. D., will be decided upon by the voters at the city election on April 20. A chamber of commerce committee recently appeared before the City Commission seeking relief for the street car system. The committee stated that the street car system was of vital importance in the development of Sioux Falls, but unless some relief were offered the company would cease operations. The survey shows that the street car company is steadily losing patronage and that its expenses are steadily increasing. Each year shows the company to be operated at a greater loss. The loss is shown in both the bus and street car departments. Relief is sought in several ways. It has been proposed to increase the fares to 10 cents and to sell fifteen rides for $1; to relieve the company of having to pay for the paving between its rails and a foot on each side; to change track construction and reduce the taxes on the property.

Extension of Public Control of "L" Favored

At the first voting the bill to extend the public control of the Boston Elevated Railway, Boston, Mass., for a period of 30 years scored a victory in the Massachusetts Legislature. The committee on metropolitan affairs and committee on street railways, sitting jointly, voted in favor of the bill, fourteen to ten, with three members reserving their rights and three not voting. The bill, as approved, is reported in the House.

News Notes

Changed Fare Approved.—The Public Service Commission has approved by special permission an amended tariff of the Kingston Consolidated Railroad providing for a sale of ten school tickets good in the city of Kingston, N. Y., and suburbs for 50 cents, effective March 1.

Increased Fare in Effect.—The East St. Louis Railway, effective March 11, raised the cash fare over the Eads Bridge from St. Louis to points in East St. Louis, Ill., from 13 cents to 15 cents. Persons who use tokens, which are purchased five for 40 cents, can make the trip for a token and 5 cents. A federal injunction recently secured at Danville, Ill., restrained the Illinois Commerce Commission and state, county and East St. Louis city legal officers from interfering with a raise in the basic city fare in East St. Louis from 8 cents to 10 cents and tokens from two for 15 cents to five for 40 cents.

Wage Negotiations in Scranton.—Wage conferences are being held with the officials of the Scranton Railway, Scranton, Pa., and the carmen's union looking to a new contract to replace the old one expiring on March 31. The railway employees' union is demanding an increase of 11 cents an hour for motormen and conductors and a boost of 16 cents an hour for track men and 17 cents for carhouse men. The company has been asked to make the hourly rate of pay for operators of one-man cars $1 an hour instead of 72 cents. Under the present one-year contract the men receive 58, 61 and 64 cents.

Transfer Plan Extended.—The Memphis Street Railway, Memphis, Tenn., has started a new plan of allowing several transfers to its patrons for the one fare. Conductors are instructed to punch transfers twice or three times providing the patron is bound for a destination that is in one general direction. Prior to the latest transfer innovation the crosstown line was the only one permitting two transfers for one fare.

Line Between Marietta and Beverly May Continue.—Officials of the Monongahela West Penn Public Service Company are willing to continue the Muskingum Valley line between Marietta, Ohio, and Beverly if a plan can be worked out by which the company will receive enough to meet actual operating expenses. The directors of the local Chamber of Commerce will co-operate with officials of the company in an effort to work out some method by which the company may operate.

Honor Long Service.—Officials and employees of the Indianapolis Street Railway, Indianapolis, Ind., on March 12 honored William F. Milholland, assistant secretary-treasurer, with a surprise party in the counting room of the company's offices. The event was in celebration of the completion of his 42d year of service with the company. As a token of esteem from the employees Mr. and Mrs. Milholland received a table lamp.

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Recent Bus Developments

Reorganized Property to Run Buses

Unified transportation service, consisting of interurban cars and buses, between Cincinnati and Dayton, Ohio, is planned by the bondholders' reorganization committee of the Cincinnati & Dayton Traction Company, which acquired the property at the receiver's sale on March 8. Plans of the new owners to rehabilitate the system contemplate bus routes wherever needed in the Miami Valley from Dayton to Cincinnati. This may mean the installation of buses not only on the main line but on the city lines in Hamilton, which have earned money under the four years of receivership at a 5-cent rate of fare. Buses will be run in parts of that city now inadequately served by the electric railway. Nothing definite will be attempted until the sale of the railway under foreclosure is approved by the court.

Bus Franchise Sought to Replace New York & Long Island

Service on the New York & Long Island Traction Company lines will end in April. The lines extend from Mineola to Freeport, from Jamaica to Mineola and from Jamaica to Hempstead, in Long Island. The transit property, including franchises, was sold recently under foreclosure.

The receivers have organized the Queens-Nassau Transit Company, Inc., and application for bus franchises to cover the routes now served by the trolley cars has been made by the Board of Supervisors. Edward A. Roberts, general manager of the receivers, is head of the new corporation. The plans of the new company, Mr. Roberts said, insure improved service for the present patrons of the trolley lines. The rate of fare would remain on the present basis of 5 cents between villages.

No Suspension in Rockford Until Bus Is Assured

No attempt to abandon the interurban lines to Freeport and Janesville will be made until the protection of patrons of these lines is assured by the establishment of adequate bus transportation. This statement was recently made by Adam Gschwindt, receiver for the Rockford, Ill., interurban lines. From the time the receivership was declared it has been obvious that one of the principal steps in the rehabilitation of the Rockford City Traction Company would be to shake the city lines free from the two interurban lines, which have been a constant drain upon the company's finances, the receiver said. The question of financing the company's rehabilitation program is of first importance, the receiver says. He has suggested the underwriting of a $600,000 bond issue for rehabilitation of the traction lines. He proposed to issue receiver's certificates for that amount which would be first lien upon the property. Cost of new tracks under the rebuilding plan will be about $300,000, including incidental paving costs, and the remainder will be expended for new equipment and replacements.

Interurban and Stage Terminal for Seattle

A magnificent interurban and stage terminal and a big service building are to be constructed this year in Seattle by the Puget Sound Power & Light Company. The new terminal, to be two stories high, will be built of reinforced concrete faced with brick and stone in such a manner that it may be increased to eight stories and used for office purposes. The estimated cost of the building is $400,000. It will be used as the Seattle terminal of the Everett interurban line and at the same time will form headquarters for all stage lines operating in and out of the city. The site has not yet been decided upon.

The service building will occupy an area of 35,000 sq.ft. It will be of reinforced concrete, one story high. This building will also be so designed as to support additional stories should occasion arise. It will be used for linemen's headquarters, housing automobiles, meter department and various other purposes. Its cost is estimated at $175,000. Several sites are now under consideration.

Hearing on Reading Railway Bus Grant

Five electric railways and a borough opposed the application by the Reading Railway for permission to operate bus service from Pottstown to Pine Ford and Barto, Pa. The hearing was held recently in City Hall at Philadelphia before Russel Wolfe, an examiner for the Public Service Commission. The basis for the protest was that the proposed bus lines would parallel services already in operation. E. D. Osterhout of the Reading Railway testified that the decision to establish bus lines was taken as the result of a survey which showed that passenger traffic had fallen off in recent years as a result of the increased use of automobiles.

Hearing on Interstate Bus Bill on March 22 and 23

Representatives of fifteen bus operators' associations were scheduled to meet in Washington on March 19 to perfect through the American Automobile Association a permanent national organization. The body will be known as the Bus Division of the A.A.A. and is expected to merge the bus men of the country for closer co-operation.

Delegates to the meeting March 19 expect to be on hand to attend Senate committee hearings set for March 22 and 23 on the Cummins bill, which provides for regulation of bus lines in interstate commerce.

Operation Sought Between Rochester and Irondequoit.—The Rochester Railways Co-ordinated Bus Lines, Inc., has applied to the Public Service Commission for a certificate for operation of a bus line between Rochester and the town of Irondequoit. An hourly service is planned over the route from 6:15 a.m. to 11 p.m.

Certificates for Massachusetts Operation Extended.—Temporary bus certificates in Massachusetts, which would have expired on Dec. 5, 1925, but were extended by the Public Utilities Department until March 31, have been extended again until May 21. The reason for this extension is that the Public Utilities Department is still working on the rules and regulations for the control of bus operations in Massachusetts.

Buses to Supplant 2-Mile Railway.—W. H. Ward of Ward & Ward, Houston, Tex., has been granted a franchise by the City Commission to operate buses in Brownsville. At the same meeting an ordinance was passed, effective at once, canceling the franchise of the Brownsville Street & Interurban Railroad. The railway operated 2 miles of line. Mr. Ward proposes to start service with two buses and increase the number as conditions require. The franchise to Mr. Ward is not exclusive.

Bus Route Questions Involved.—The Citizens Transit Company, a subsidiary of the Citizens' Traction Company, Oil City, Pa., has asked permission to give up the bus franchise between Hydetown and Pleasantville. V. A. Redfield, general manager of the Citizens' Traction Company, said there had been no action toward relinquishing the Titusville bus route but that matters were considerably involved at the present time. In any event bus service as far as Rouseville would be maintained.

Route Between Frankfort and Delphi Sought.—The Indiana Motor Transit Company, a subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company of Indianapolis, has applied to the Indiana Public Service Commission for a bus route between Frankfort and Delphi, setting forth that the Monon Railroad, the only other carrier connecting the cities, does not supply local service to intermediate points. It is planned to provide Delphi people with quick transportation to Indianapolis, connecting with the traction line at Frankfort. The operating schedule calls for five round trips a day and a 75-cent fare between the cities.

Gary-Lafayette Route Authorized.—The Indiana Public Service Commission has authorized the operation of the Gary-Lafayette bus route by the Gary Street Railways, Gary, Ind. Service between the two points will begin shortly. Included in the grant to the company will be authorization to operate between Gary and Crown Point. The route will provide a continuous bus line from Gary to Indianapolis.

Bus Replacement Under Consideration.—The Manhattan & Queens Traction Company has under consideration a proposal to replace the trolleys on Queens Boulevard, L. I., between Jamaica and New York, with buses.

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Financial and Corporate

New York Surface Line Does Better

Directors of the Third Avenue Railway, New York, have declared a semi-annual payment of 1¼ per cent on the 5 per cent adjustment bonds of the company payable on April 1. The last payment on this account was also of 1¼ per cent. It was made Oct. 1 to cover the six months ended June 30, 1925. Accumulated interest on the bonds, including the interest payment of Oct. 1, was 22½ per cent on July 1, 1925.

The net deficit in January was $16,128, against $72,016 in January, 1925. Total operating revenue in January was $1,210,308 against $1,444,635. Gross income after operating expenses, taxes and addition of interest revenue was $205,854, against $152,879. Interest charges of $221,982, against $224,896, resulted in the deficit.

Operations in the six months ended Jan. 31 resulted in a net income of $51,939, against a net deficit of $114,494 in the same period a year before. Total operating revenue was $8,598,132, against $8,479,812. Gross income after operating expenses and taxes and the addition of interest revenue was $1,626,898, against $1,461,912. The net income figures for the period are after interest charges of $1,574,958, against $1,576,407 reported by the company in the previous period.

Bonds Called in Accordance with Ruling

Rolla Wells, receiver for the United Railways, St. Louis, Mo., has called for payment on April 1, 1926, the Lindell Railway first mortgage gold bonds, Cass Avenue & Fair Grounds Railway first mortgage gold bonds and Compton Heights, Union Depot & Merchants Terminal Railroad first mortgage gold bonds, extended to Oct. 1, 1923, including principal and accrued interest at 8 per cent per annum from Oct. 1, 1923, to April 1, 1926. No interest will be paid on the bonds after April 1. The call for payment of these bonds is in accordance with a recent order of the United States District Court.

Another Brooklyn-Manhattan Transit Common Dividend

Directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., announced on March 15 the second quarterly dividend of $1 to be declared on the corporation's common stock. Although nothing official to the effect was stated, the action was considered in financial and banking circles as another step toward placing the stock on a $4 annual basis.

Dividends on the common stock were announced on Dec. 21 for the first time since reorganization of the company, May 24, 1923. Directors then declared a dividend of $2 applicable to the period from organization to Sept. 30 last and another dividend of $1 for the period from Oct. 1 to Dec. 31, both payable Jan. 20 to stock of record Jan. 5.

Gross revenue of the company in January was $3,678,316, against $3,613,674 in January, 1925, and surplus after charges $383,533, against $339,615 in the preceding January. Gross revenue in every month for the last seven months has been greater than in the corresponding month a year previous, and, with the exception of December, the same has been true of surplus after charges.

Interurban Issues Called for Payment

The Chicago, Aurora & Elgin Railroad, Aurora, Ill., is calling all outstanding two-year 6½ per cent secured gold notes dated Dec. 1, 1924, and all series A refunding and improvement mortgage 7 per cent gold bonds, dated April 1, 1922. The former will be paid March 27 at par and accrued interest at the office of the Wilmington Trust Company, Wilmington, Del., and the latter April 1 at 101 per cent and accrued interest at the office of the Girard Trust Company, Philadelphia, Pa.

As part of this plan the company recently placed with the public $5,000,000 of first and refunding mortgage 6 per cent bonds at 96 and interest, yielding 6.30 per cent, as noted in the ELECTRIC RAILWAY JOURNAL for Jan. 30, page 215.

Public Service Railway Reports Gain

New Jersey Company Goes Ahead with Its Co-ordination Plan—Slight Decrease in Trolley Passengers—Bus Business Has Grown from 1,952,059 Passengers in 1923 to 146,053,237 in 1925

MORE records were broken by the Public Service Corporation of New Jersey, Newark, N. J., for the year ended Dec. 31, 1925. Operating revenues of subsidiary companies totaled $94,715,525. Before any dividend payments there was a net of $9,995,325. Preferred dividends to the amount of $3,223,728 were paid and common dividends to the amount of $4,781,557. In 1924 common dividends totaled $2,959,329. The net increase in surplus for 1925 was $1,990,039.

It is impossible here to go into all the operations of the company as a whole. To street railway men the main interest in the operation of the company lies in the results secured in the so-called transportation group. Much of that story is told in the income account of the Public Service Railway and other affiliated companies reproduced in the accompanying statement.

The problem presented to the management in connection with the Public Service transportation system is largely one of economical and at the same time efficient operation. As the company sees it, that part of the task of solution which depends upon the company is being worked out. But the problem goes deeper than that. It is believed that if car and bus service be further co-ordinated, better traffic regulation be enforced and the railway relieved of charges resulting from paving obligations imposed in the days of the horse car and no longer fair or just the position of transportation companies can be much improved.

The use of one-man cars was further extended, so that all cars in the system

INCOME ACCOUNT OF PUBLIC SERVICE RAILWAY AND OTHER COMPANIES IN TRANSPORTATION GROUP FOR THE TWELVE MONTHS ENDED DEC. 31, 1925

	Public Service Railway	Public Service Railroad	Public Service Transportation Company	Other Affiliated Companies	Total
Operating revenues	$21,035,933	$283,610	$7,608,504	$1,589,869	$30,517,918
Operating expenses	$10,327,449	$91,968	$4,579,636	$656,892	$15,655,947
Maintenance	3,077,399	69,757	2,505,929	119,772	5,772,859
Taxes	2,212,429	51,693	427,918	142,116	2,834,157
Depreciation	802,243	.....	826,116	107,500	1,735,859
Operating revenue deductions	$16,419,521	$213,419	$8,339,600	$1,026,281	$25,998,823
Operating income	$4,616,411	$70,191	†$731,095	$563,588	$4,519,095
Non-operating income (exclusive of dividends of affiliated companies)	117,286	908	4,038	22,053	144,286
Gross income	$4,733,698	$71,099	†$727,057	$585,641	$4,663,382
Income deductions (bond interest, rentals and miscellaneous interest charges)	4,978,697	123,670	14,305	76,117	5,192,791
Net income or loss	†$244,999	†$52,570	†$741,363	509,524	†$529,408
Profit and loss accounts (excluding dividends)	*6,431	*2,747	.....	*2,494	*11,672
Surplus (before dividends)	†$238,567	†$49,823	†$741,363	$512,018	†$517,735
Intercompany dividends	*324,574	.....	.....	324,574	.....
	$86,006	†$49,823	†$741,363	$187,444	†$517,735
Dividends paid unaffiliated interests (directors)	.....	.....	.....	226	226
Net increase or decrease in surplus	$86,006	†$49,823	†$741,363	$187,218	†$517,961

*—Credit. †—Deficit.

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OPERATING REVENUE OF SUBSIDIARY UTILITY COMPANIES OF PUBLIC SERVICE CORPORATION OF NEW JERSEY

Year	Electric Properties	Gas Properties	Transportation Properties	Total
1914	$9,293,661	$10,320,536	$16,310,255	$35,924,453
*1915	10,425,851	10,475,933	16,569,443	37,471,228
1916	12,814,597	11,558,413	18,175,764	42,548,775
1917	15,168,255	12,729,060	19,394,025	47,291,342
1918	17,587,806	14,578,269	20,831,762	52,997,838
1919	20,054,659	14,941,745	24,140,356	59,136,762
1920	23,563,929	20,872,062	27,882,095	72,318,087
1921	24,390,321	23,516,318	27,404,867	75,311,507
1922	27,660,026	23,152,426	27,544,509	78,356,962
1923	31,188,595	24,814,283	23,105,003	79,107,882
1924	34,889,632	24,542,643	28,257,177	87,689,453
*1925	40,016,174	24,181,431	30,517,918	94,715,525

* Change in classification of accounts effective Jan. 1.

are now so operated; the 5-cent fare plan was extended to cover all lines; wherever possible, both on lines where Public Service controls all service and on those on which independent bus operation is still in vogue, operating schedules were established to the satisfaction of both the public and the municipal officials, while in some instances it was possible to discontinue duplicate service and run cars and buses as supplements to each other.

A change in form of company organization, affecting both the railway and the transportation companies, noted previously in the ELECTRIC RAILWAY JOURNAL, was made with the idea of centralizing authority and responsibility in operating heads of the six divisions. A manager and an assistant manager were appointed for each division, who report direct to the vice-president in charge of operation and to whom report the division officers in charge of transportation, way, overhead and shops.

The conversion during the year of 333 closed and 197 open cars for one-man operation brought the total number of converted cars up to 1,789. In connection with this work pneumatic door mechanism and folding steps were placed on 428 cars and electric fare boxes and registers installed in 718.

Some 960 cars were completely overhauled, major repairs made to 800 others and 1,442 pasenger and 22 service cars repainted.

During the year 22.5 miles of track was reconstructed with new rails. More than 7.5 miles was reconstructed with the same rail, and 3.8 miles of track extension made, largely in connection with outdoor car storage at carhouses used in part as garages. Track was carefully maintained and is in satisfactory operating condition.

The policy of utilizing, wherever desirable, carhouses and other railway service buildings for garage purposes was continued. A combined carhouse and garage, having capacity for 70 buses, and indoor and outdoor storage for 44 cars, was erected at Sanford Street and Commercial Avenue, New Brunswick. This permitted the closing of the Milltown carhouse.

Through an arrangement with the United States government, in connection with the relocation of track in West Deptford, the former Washington Park carhouse was relocated in the yard adjoining the Newton Avenue, Camden, carhouse, where it is available as a garage.

On Dec. 6, under an arrangement with the Morris County Traction Company, cars of that company began operation over tracks of the Public Service Railway in and out of the Public Service terminal at Newark. The operation has so far proved mutually satisfactory and affords a decided accommodation to the public.

STATEMENT OF MILEAGE OF THE PUBLIC SERVICE RAILWAY AS OF DEC. 31, 1925

	Miles
First main track	523.285
Second main track and turnouts	295.097
Connections, crossovers, wyes and loops	11.983
Carhouse and yard tracks	46.253
Total	876.618
Total number of passenger cars available for operation: Closed 1,876 Open 339	
Number of new passenger cars since 1903: Closed 1,493 Open 327	
Track reconstructed with new rail during 1925	22.532
Track reconstructed with same rail during 1925	7.556
Extensions built during 1925	3.804

PUBLIC SERVICE TRANSPORTATION COMPANY

Very considerable progress was made during the year in bringing about an improvement in conditions surrounding the operation of buses by the company. An organization fitted for the complex task of handling the large number of vehicles required for service in the territory is, as a result, taking permanent form; garage and shop facilities were extended; efficiency of methods was bettered, and operating experience acquired, all in anticipation of further co-ordination of car and bus service that will give to the people of the territory served one of the largest and best local transportation systems.

The year's activities culminated in the placing, in December, of an order for 333 gas-electric buses of a type which it is believed will provide the maximum of convenience and accommodation for the public, and at the same time materially reduce the expense of maintenance, which, owing to the character of equipment purchased from independent operators, has been abnormally high.

Experience in the southern division, where it has been possible to effect a high degree of co-ordination, makes it evident that if co-ordination to a like extent is attained in other divisions service can be improved and economies effected to the benefit of both the riders and the companies.

Garage and shop facilities were, during the year, extended and improved. A 140-bus garage was built at Bloomfield Avenue and Lake Street, Newark. In the same city a building on Frelinghuysen Avenue, owned by the Autocar Company, was purchased and is used in part as a garage. In New Brunswick a new carhouse and garage which will accommodate 70 buses was built. In Paterson the Lakeview and the Market Street carhouses were remodeled for garage purposes. In Rutherford the power house section of the Rutherford carhouse was converted into a garage. In West Hoboken one bay of the carhouse was remodeled for garage purposes and an adjacent building purchased for storage purposes, while a building at Spring and Angelique Streets, formerly used by the track department, was taken over as a garage.

Bus service buildings were erected at Broadway Loop, Market Street and Lakeview garages, Paterson, and at Hilton garage, Maplewood. Hydraulic gasoline systems were installed at the Lake Street, Sanford Street and Sherman Avenue garages, Newark.

Shop facilities are in shape to meet all present requirements. During the year 1,464 buses were completely or partially overhauled, while much bus equipment was rebuilt.

It has been the aim to consolidate, wherever possible, the facilities and working organization for cars and buses and substantial economies have resulted from this policy. In accordance with the privilege conferred by an act of the Legislature, approved

TRANSPORATION STATISTICS COVERING OPERATIONS OF PUBLIC SERVICE SYSTEM IN NEW JERSEY

Year	Trolley Passengers	Bus Passengers	Total Passengers	Trolley Mileage	Bus Mileage	Total Mileage	Trolley Hours	Bus Hours	Total Hours	Passenger Receipts per Trolley Mile	Passenger Receipts per Bus-Mile, Cents
1914	407,277,914	.....	407,277,914	50,792,889	.....	50,792,889	5,665,119	.....	5,665,119	30.72c	.....
1915	414,422,040	.....	414,422,040	51,873,660	.....	51,873,660	5,573,670	.....	5,573,670	30.49c	.....
1916	451,698,012	.....	451,698,012	54,964,708	.....	54,964,708	5,911,131	.....	5,911,131	31.37c	.....
1917	476,974,983	.....	476,974,983	56,087,403	.....	56,087,403	6,021,225	.....	6,021,225	32.44c	.....
1918	451,220,806	.....	451,220,806	54,039,150	.....	54,039,150	5,698,089	.....	5,698,089	36.00c	.....
*1919	396,689,234	.....	396,689,234	57,644,927	.....	57,644,927	6,039,453	.....	6,039,453	39.29c	.....
1920	453,534,694	.....	453,534,694	60,798,743	.....	60,798,743	6,539,207	.....	6,539,207	43.21c	.....
1921	435,679,801	.....	435,679,801	58,309,883	.....	58,309,883	6,212,276	.....	6,212,276	44.11c	.....
1922	410,212,814	.....	410,212,814	56,419,982	.....	56,419,982	5,983,122	.....	5,983,122	45.59c	.....
1923	354,194,933	1,952,059	356,146,992	49,272,078	505,322	49,777,400	5,206,092	60,663	5,266,755	42.75c	22.43
1924	427,828,444	69,383,643	497,212,087	53,945,515	15,703,663	69,650,178	5,662,340	1,928,498	7,590,838	41.04c	26.13
1925	416,788,621	146,053,237	562,841,858	50,115,119	27,506,493	77,621,612	5,402,008	3,273,801	8,675,809	41.32c	27.41

* Mile zone system in effect from Sept. 14 to Dec. 7.

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March 19, 1925, the company is now carrying all of its own liability insurance.

Of the popular ownership plan the company says it has not only given the added strength that comes from a veritable army of citizens financially interested in Public Service, but it has afforded an opportunity of spreading a concrete knowledge of Public Service facts among a large part of the public and among company employees as well.

Surplus Increases.—The gross earnings of the Lake Shore Electric Railway, Cleveland, Ohio, for the period from Jan. 1 to Dec. 31, 1925, were $3,199,762, against $3,099,489 for a similar period of the year previous. The surplus was $105,092, against $92,198 for the twelve months period January to December, 1924.

Service Discontinued.—Passenger and freight service on the Cleveland, Painesville & Eastern Railroad, between Painesville and Ashtabula, Ohio, ceased operation on Feb. 27, following foreclosure of a $1,000,000 mortgage by the Cleveland Trust Company. Passengers hereafter will be transported over the Painesville & Eastern Railway between Cleveland and Painesville. It was said in ELECTRIC RAILWAY JOURNAL of Feb. 20 that the disposition of the railway following the sale of the electric light and power properties of the company was not known. The railway operated 38 miles of track.

Kansas Line Would Quit.—The Arkansas City-Winfield Northern Railway, Winfield, Kan., asked permission recently to abandon service and remove its equipment and tracks between the two cities. The line operates 20 miles.

Street Cars in Highland Sold.—The title to seven street cars of the abandoned New Paltz & Highland Traction Company, Highland, N. Y., was received by Morris Levinson at an auction sale on March 16. Tax Collector George Canfield offered the seven cars to recover $843 taxes and costs assessed against the railway. Mr. Levinson's bid was $910, whereupon Mr. Canfield called off the auction of the remainder of the company's property. The line which extends for 8 miles was built some twenty years ago.

Seek to Junk Line.—The town of Hampton, N. H., has voted by an overwhelming majority to junk the municipally operated electric street railway. It is said that the line has never been a profitable investment since the town started to operate it in 1921.

Offer Made for Savannah Company.—The Engineers Public Service Company seeks to control the Savannah Electric & Power Company, Savannah, Ga. The proposed transaction involves the exchange of common stock of the Savannah company for stock of Engineers and the purchase of a substantial amount of the preferred stock. The Savannah Electric & Power Company will be operated as a separate unit under the operating direction of Stone & Webster as in the past. No change in the operating or executive organization is contemplated. An improvement program to cover three years and cost $3,000,000 has been outlined.

Personal Items

E. J. Blair to Run Interurban

Assistant to B. I. Budd to Carry Forward Intensive Program for the Aurora Road

Edward J. Blair, assistant to B. I. Budd, president of the Chicago Rapid Transit Company, has been appointed general manager of the Chicago, Aurora & Elgin Railroad, sold recently to the Insull interests. In this post he succeeds J. H. McClure, who, as previously noted in the ELECTRIC RAILWAY JOURNAL, goes with the Cincinnati & Dayton Traction to serve the same financial interests that recently sold the Aurora property.

E. J. Blair

While strides were made in the rebuilding of the Aurora property under the direction of Mr. McClure that put the property on a paying basis, the Insull interests are understood to plan still further to develop this road as a unit in the vast system of similar properties recently acquired serving suburban Chicago and towns in the immediate vicinity. Other economies are possible in the absorption of this system with the North Shore, South Shore and other roads now under Insull operation. The program for the Aurora road includes intensive development of several pleasure resorts. All of this work will be under the personal direction of Mr. Blair.

After completing a course of study at Lewis Institute, Chicago, Mr. Blair went to Cornell, from which he was graduated in 1905 with a M.E. degree. In that year he began work in the Throop Street shops of the Metropolitan Railroad, Chicago, as a night helper. Two months later he was given a day job as pipefitter foreman, and four months thereafter he went into the engineering department as a draftsman and inspector on track elevation work. In the fall of 1906 he was made a carpenter foreman in the maintenance of way department.

After eight months spent at this work Mr. Blair was made a storage battery operator in the old Throop Street power house of the Metropolitan. In 1908 he was promoted to the position of engineer of substations and transmission lines, with jurisdiction over the entire distribution system of the company. He was again promoted in 1910, becoming electrical engineer of the Metropolitan lines. Upon the consolidation of the several elevated railroads he was made electrical engineer of the Chicago elevated railways.

Commissioned a captain of engineers in 1917, Mr. Blair was stationed at Camp Grant for nearly a year, at the end of which he was sent overseas with the rank of major. He was subsequently promoted to lieutenant-colonel. Upon his return to the Chicago elevated railways in August, 1919, he was given the title of organization engineer with the duty of studying operating conditions with a view to recommending improvements in methods. In 1920 he was made assistant to the president.

Mr. Blair is well known to members of the American Electric Railway Engineering Association through his connection with several of its committees. He was chairman of the 1922 exhibit committee, the year in which the A.E.R.A. convention was held in Chicago.

W. K. Myers Heads Philadelphia Rapid Transit

W. K. Myers was elected president of the Philadelphia Rapid Transit Company to succeed W. C. Dunbar at the organization meeting of directors following the annual meeting of stockholders on March 17.

Mr. Myers had been a vice-president of the company. Mr. Dunbar is temporarily released by the Mitten organization at the request of Dillon, Read & Company, the P. R. T. bankers, to aid them in the financial rehabilitation of the Detroit United Railway. Mr. Myers also succeeds Mr. Dunbar as a member of the executive committee.

W. P. Johnston Promoted at Spokane

W. P. Johnston has been appointed operating head of the Spokane & Eastern Railway & Power Company and the Spokane & Inland Empire Railway, comprising the "Inland" electric interurban properties of the community, in the Spokane, Wash., territory. He succeeds Waldo G. Paine, the late general manager. Mr. Johnston has the title of assistant general manager. The appointment came during a visit to Spokane of Albert W. Harris, president of the Harris Trust & Savings Bank of Chicago, and M. H. MacLean, of the same institution, when a complete inspection of the properties was made and improvements authorized for this year. Mr. Johnston began work with the "Inland" as an agent twenty years

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ago. In the summer of 1923 he was appointed assistant general freight and passenger agent.

The "Inland" system disposed of the city electric lines in a merger with those of the Washington Water Power Company in 1922, when the Spokane United Railways was created. The Nine Mile generating station was sold to the Washington Water Power Company last July. The deficit of past years at which the remaining properties of the system have been operated has been overcome and the company is now in the "black."

C. S. Sale Heads New American Car & Foundry Motors Company

C. S. Sale, president of the new American Car & Foundry Motors Company, which has taken over the Fageol Motor Car Company of Ohio and the Hall-Scott Motors Corporation, represents a type of executive responsible for the expansion of American Car & Foundry interests into the largest equipment combination in the transportation field. His connection with Car & Foundry goes back to wartime days and the Federal Railroad Administration. He became assistant to the president of the Railway Car Manufacturers Association in 1917 and as such acted as a point of contact for the several car manufacturers in their various dealings with the administration at Washington. Largest among these manufacturers was the American Car & Foundry Company. His grasp of the many intricate problems arising in connection with that company's vast and diversified business ultimately led to his becoming permanently attached to the executive department of the company.

C. S. Sale

Mr. Sale has taken a leading part in the negotiations which necessarily were required by the growth of the Car & Foundry organization and the absorption of allied plants and properties. He serves as a member of the board of directors of a number of allied properties, including among others the Pacific Car & Foundry Company, the Carter Carburetor Company, the J. G. Brill Company and the new Brill Corporation. As president of the American Car & Foundry Motors Company, he is in direct executive charge of the development of vehicles for highway transportation.

Mr. Sale was graduated from Purdue University in 1906. Before he joined the Car Manufacturers Association he spent a period of approximately three years in editorial work with the *Electric Railway Review*, later absorbed by ELECTRIC RAILWAY JOURNAL, and with *Railway Age*.

H. F. Dicke Vice-President at Allentown

H. F. Dicke, assistant to the president of the Lehigh Valley Transit Company, Allentown, Pa., has formally succeeded H. H. Patterson as vice-president and director. Mr. Patterson resigned on Dec. 31 last. Mr. Dicke went to Allentown on May 1, 1925, from Salt Lake City where he had charge of the Utah Light & Traction Company as general manager for eight years. He has been acting vice-president at Allentown since the announcement of Mr. Patterson's retirement was made last fall.

Changes in Medical Staff at Baltimore

Dr. Roy W. Locher has been appointed chief surgeon of the United Railways & Electric Company, Baltimore, Md., to fill the vacancy caused by the death of Dr. Harrison. Dr. Locher has been associated with the United Railways since 1913.

Dr. Walter D. Wise has been named consulting physician and Dr. H. B. McElwain has been appointed assistant to the chief surgeon.

B. W. Arnold Appointed Assistant General Manager of North Shore

Another step toward the top of the ladder in the transportation field has been attained by B. W. Arnold of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., through his latest promotion from superintendent of the company's motor coach division to assistant general manager of the line with headquarters in Milwaukee.

Mr. Arnold joined the North Shore Line on Jan. 1, 1924, prior to which time he was connected with the Wisconsin Power & Light Company at Oshkosh as general manager of its electric railway and bus properties since 1917. The success with which Mr. Arnold has built up the motor coach properties of the company is disclosed in the fact that the number of bus divisions operating as feeders of the main line now number nine, while only three were in operation when he was assigned the task of directing the company's bus services.

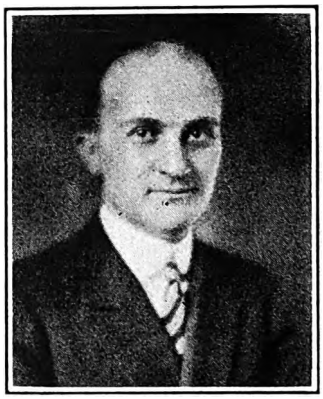
Mr. Arnold has spent practically his entire life in the railway work. He started his career at the age of fourteen as a call boy for the Wabash road in Clyde, Ohio. He later learned telegraphy and worked as an operator and dispatcher for the Wabash. He left the steam field and later was associated for eleven years with the Illinois Traction System as its division superintendent and superintendent of transportation.

Editor in Merchandising Post

James Ashton Greig Joins Railway at Toledo in Charge of Commercial Department

James Ashton Greig, connected with the editorial staff of *Electric Traction* for four years, the last three years as editor, has been appointed sales manager of the Community Traction Company at Toledo, heading the new commercial department. He took up his new duties on March 15.

In announcing Mr. Greig's appointment J. Frank Johnson, vice-president and general manager of the Community Traction Company, declared the time had come when railways must regard their business much as a manufacturer does his and secure a proper balance between production and marketing. He said the new sales or commercial department was being developed for the sole idea of selling transportation.



J. A. Greig

Mr. Greig brings to his new task a wealth of experience in railway and merchandising work. He was born in Chicago in 1892. Shortly afterward his parents moved to Scotland, but returned to New Rochelle, N. Y., when Mr. Greig was seven years of age. There he completed high school work and moved with his family to Chicago. He attended Northwestern University and was graduated in the letters and science course.

To earn money to continue his professional career, which he then decided was law, Mr. Greig took a position in the cadet school of the Marconi Wireless Telegraph Company, now the Radio Corporation of America. Later he went to sea for a year and a half in active charge of station KDM aboard the *Maracaibo* of the Red D line. While in this service he assisted in the original installation of station PJC on the Dutch Island of Curaçoa off the northern coast of Venezuela.

When he returned to school his interest in electricity dictated a change to engineering and he selected the University of Wisconsin, where he received his engineering degree in 1913.

Mr. Greig was employed by the Western Electric Company at its Hawthorne plant as general utility engineer, but later was promoted to engineer of elec-

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trical methods. In this capacity he assisted in designing the first submarine loading coil for the telephone line under the Hudson River between Tarrytown and Nyack.

At the outbreak of the war he enlisted, trained at the school at Fort Leavenworth, Kan., and was then commissioned first lieutenant and assigned to Radio Company A, 331st Field Artillery, 89th Infantry, Division. At the close of the war he returned to Chicago and entered the employ of the Fred M. Randall Advertising Agency as merchandising manager. In this post he handled for two years the complete merchandising service for the Williamson Candy Company and assisted in the campaign for the now famous "Oh Henry" bar.

Mr. Greig joined *Electric Traction* in 1922 as editorial assistant. Later that year he was made associate editor, and the following year editor.

During previous summer vacations he had served as a reporter on the Chicago *Daily Journal*, the New Rochelle *Times-Standard* and the New York *Sun*, and one summer acted as salesman for a large wholesale grocery house.

R. Allyn White has been appointed comptroller of the Jamestown, Westfield & Northwestern Railroad and the Jamestown Street Railway, Jamestown, N. Y. Mr. White was with the New York Central Railroad for 36 years. He has devoted most of his life to railroad work, beginning as a ticket and freight agent of the New York, New Haven & Hartford Railroad at Harlem River Station near New York in the early '80s and going to the West Shore at about the time that road became a part of the New York Central System. Since then he has been connected with the New York Central and affiliated roads in the capacity of bookkeeper, disbursing chief clerk, auditor of disbursements, auditor and general auditor at different times. In recent years he has been with the E. W. Marvin Manufacturing Company of Troy.

D. D. Bentzinger, superintendent of the railway division of the Iowa Southern Utilities Company in Burlington, Iowa, has been advanced to the general offices of the company in Centerville, Iowa, effective April 1. Mr. Bentzinger has been in Burlington 22 years. At the time of the transfer of the Peoples Gas & Electric Company to the Iowa Southern Utilities he was superintendent of the People's Gas Company properties in charge of operation.

Bernard H. McGinn, in the service of the United Railways & Electric Company, Baltimore, Md., for approximately 30 years, has resigned to accept the post offered him by Mayor Jackson as head of the newly created municipal Bureau of Stores. The selection of Mr. McGinn is a high tribute to his efficiency as well as to the Baltimore company, for which he developed a model storekeeping system that has been copied by other industries. Mr. McGinn went with the United Railways on Jan. 13, 1895. For sixteen years he was storekeeper, leaving that position in May of last year to become supervisor of freight and tariffs in the purchasing agent's department.

E. D. Gilman Street Railway Director at Cincinnati

Edgar Dow Gilman, executive secretary to Col. C. O. Sherrill, City Manager of Cincinnati, Ohio, has been appointed Director of Street Railroads and Motor Buses, succeeding W. Jerome Kuertz, who resigned March 1 after serving six years in that capacity. Mr. Gilman is a former university professor. He has already assumed his new duties, having resigned as assistant to the City Manager. He is a man of wide experience in the engineering and technical fields. He was appointed secretary to the City Manager soon after Colonel Sherrill took the office on Jan. 1.

H. Martin Walker, in traffic work in Toledo for several years, has been named district passenger and freight agent of the Lima-Toledo Railroad, with headquarters in Toledo. Mr. Walker was formerly on the staff of the traffic commissioner of the Chamber of Commerce. He served for some time as traffic manager of the Rock Products Company in Toledo.

Obituary

R. S. Noden

Robert S. Noden, mechanical engineer of the Cummings Car & Coach Company, died suddenly at Paris, Ill., on March 12. Mr. Noden had been with the Cummings Car & Coach Company and its predecessor, the McGuire-Cummings Manufacturing Company, for more than 20 years. He was graduated from Armour Institute of Technology in mechanical engineering and after leaving school was for a time in the engineering department of the Pullman Company and with the Chicago, Burlington & Quincy Railway. Mr. Noden started with the McGuire-Cummings Company as a draftsman and advanced to the position of mechanical engineer. He had been actively indentified with the development of the company's products during this long period. Mr. Noden was born on May 30, 1885.

Frank C. Randall

Frank C. Randall, Eastern manager of the Christensen Air Brake Company, died on March 11. Mr. Randall was formerly vice-president and general manager of the Christensen Engineering Company up until 1912, when he left to engage in personal business. After being away from the railway field for about twelve years he was called back to the Christensen Air Brake Company, as Eastern manager.

Mr. Randall had long been prominently identified with railway work. His first railroad experience was in 1897 with the New York & New England Railroad as "performance of engine" clerk. Later he was appointed chief clerk of the motive department of the same road, at Hartford, for all divisions west of Willimantic, and afterward chief clerk of the motive power department of the Boston & Lowell Railroad and its leased lines. Upon the consolidation of the latter road with the Boston & Maine Railroad, he obtained a position in the shops of the Tripp Manufacturing Company, and was promoted to the position of superintendent of the plant. He resigned this position to become Eastern sales agent of the J. G. Brill Company, and later was made Western sales agent, with headquarters at Chicago.

After being in the employ of the J. G. Brill Company about six years, he became Eastern sales agent of the Christensen Engineering Company, and later was appointed general sales agent and then vice-president and general manager of this company and its successor, the National Electric Company. He was also for a long while connected with the Allis-Chalmers Company, Milwaukee. He was born in Taunton, Mass., 68 years ago.

T. G. Whaling

Thomas G. Whaling, vice-president of the Westinghouse Lamp Company, died in New York City on March 1. Mr. Whaling joined the Westinghouse Lamp Company in 1906 as assistant to the manager and held the successive positions of sales manager, assistant general manager, general manager and vice-president. He was one of the pioneers in the lamp industry. Prior to his connection with the Westinghouse Lamp Company Mr. Whaling was secretary and treasurer of the Milwaukee Electric Company, Milwaukee, Wis. He was a Yale (Sheffield) man, class of 1900.

D. M. Brady

Daniel M. Brady, president and treasurer of the Brady Brass Company, New York, and the first president of the American Street Railway Manufacturers Association, died at Atlantic City on Feb. 23. A little more than three years ago Mr. Brady completed a service of 50 years in the railroad industry and of 40 years in the metal trades.

Mr. Brady was born in New York City 71 years ago. In 1871 he entered the employ of the New York Central Railroad in the office of General Manager John M. Toucey. He was afterward chief clerk of the car department under Leander Garey, general superintendent of the car department of the company. Mr. Brady resigned from the New York Central Railroad in 1883 to join the then newly organized Paige Car Wheel Company, Cleveland, with which he was connected for a number of years. In 1888 he established the Brady Brass Company and was its president from that time. For many years he was also director of the Rochester Car Wheel Works. At the time of the reorganization of the American Street Railway Association, in 1905, he had a great deal to do with the organization of the American Street Railway Manufacturers Association.

William R. Benson, prominent in the early development of the city transit system of Philadelphia, Pa., and in more recent years employed in the offices of the Philadelphia Rapid Transit Company, died on March 4.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Car & Foundry Head States Prospects Before Sailing for Europe

William H. Woodin, president of American Car & Foundry Company and of American Locomotive Company, sailed for Europe recently on the *Majestic*. Prior to his departure he discussed briefly the outlook for these important companies in the transportation field. He made the point that both concerns are now operating in excess of 50 per cent of capacity. He said:

Both have operated on a common dividend earning basis to date this year. Equipment companies in 1925 experienced about the worst year in the last two decades, while railroads generally had one of their best years. This year things should be different with us. The railroads for the first time in years have plenty of money and are in a position to order equipment, and in my opinion they will be heavy buyers of locomotives and railroad equipment this year; as a result, companies of our type should enjoy a big year.

According to Mr. Woodin the acquisition of the Hall-Scott, Fageol and J. G. Brill Companies by the American Car & Foundry Securities Corporation should add materially to the earnings of American Car & Foundry Company. He said it was generally recognized that Hall-Scott makes one of the best motors on the market and, if the need arises, American Car & Foundry has four large car-building plants which may be turned over to bus-body making on short notice.

He denied that the American Car & Foundry Securities Corporation, whose stock American Car & Foundry owns 100 per cent, has bought into the Pierce-Arrow Company.

He also denied the rumor that American Car & Foundry is thinking of acquiring the Pullman Car & Manufacturing Company if it is ever segregated from the Pullman Company proper. The Federal Trade Commission would not allow such a merger. He said:

You will notice that the mergers in which we have participated have not been with competing companies.

Bridgeport Brass Advances Two Able Executives

At a recent meeting of the Bridgeport Brass Company Warren D. Blatz, general sales manager, and Walter R. Clark, general works manager, were elected to the board of directors in recognition of their ability as executives of the firm.

Mr. Blatz became affiliated with the Bridgeport Brass Company in 1916. His work has always been in the sales department. Five years ago he was made sales manager of the mill products division. About three years ago he was made general sales manager and since that time has been very active in building up Bridgeport sales throughout the country. He was born in Brooklyn, N. Y., attended the Hillhouse High School, New Haven, and later was graduated from the Boardman Manual Training High School in New Haven, in 1901. He then took a two years post-graduate course in higher mathematics.

In 1905 Mr. Blatz went to Bridgeport as junior clerk with the T. L. Watson Company at a salary of $6 a week, intending to earn money enough to get further schooling in the fall. He liked the work and remained with this company for twelve years, when he left to join the Bridgeport Brass Company organization.

Mr. Clark was graduated from Yale (Sheffield School), class of '99. In 1900 he started in as a draftsman in the Bridgeport Brass Company. He soon rose to be head draftsman and later was made chief engineer, which position he held until 1919, when the duties of works manager in the mill products division was added to his other duties. During this period the company expanded from its small site to its present place in the industry. Under his supervision, the Housatonic plant was built. In 1921 he was made general works manager in charge of both divisions, which position he holds today.

Bids on Cars to Be Asked by Seattle

The last legislative step necessary for the purchase of 80 new street cars for the Municipal Street Railway of Seattle, Wash., was taken recently when Mayor E. J. Brown filed with the city clerk the purchase ordinance duly signed. It is planned to operate the new cars on the pay-as-you-leave plan as well as the pay-as-you enter plan. It was announced by D. W. Henderson, superintendent, that the former plan will be in use when the cars are loading downtown during the rush hours, while the latter will be in force at other times. Thirty days after the ordinance was signed by the Mayor, the Board of Public Works will advertise for bids. The new cars will be 45 ft. in length and each will have a seating capacity of 58.

Locomotives for Montreal Harbor

Five electric locomotives will be delivered to the Harbor Commissioners of Montreal, Canada, this summer, for use on the waterfront. With the four already in use this will bring the number of electric locomotives owned by the commissioners to nine. The units are being made in England and are of the inclosed cab type with double end control and pantograph collection. To suit special requirements each locomotive has two master controllers, one at each end, in order to save time in freight operations. They weigh 100 tons and are rated at 2,400 volts.

According to the contract between the commissioners and the makers the first engine will be shipped on June 8 and should arrive in Montreal about

ELECTRIC RAILWAY MATERIAL PRICES—March 16, 1926

Metals—New York

Copper, electrolytic, cents per lb.	14.15
Lead, cents per lb.	8 20
Nickel, cents per lb.	35 00
Zinc, cents per lb.	7 725
Tin, Straits, cents per lb.	66 00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56 00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.475
Somerset mine run, Boston	2.15
Pittsburgh mine run, Pittsburgh	2.00
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.425
Kansas screenings, Kansas City	2.425

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.25
Sheet iron, galvanized (28 gage), cents per lb.	4.50
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	10.80
White lead in oil (100 lb. keg), cents per lb.	15.50
Turpentine (bbl. lots), per gal.	$1.03
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4-6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	16.25
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.625
Light copper, cents per lb.	9.625
Heavy brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	4.50
Lead, cents per lb. (heavy)	6 50
Steel car axles, Chicago, net ton	$17 75
Cast iron car wheels, Chicago, gross ton	17 25
Rails (short), Chicago, gross ton	17 75
Rails (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	9.00

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June 21. The rest will be shipped one a week, so that the five are expected to be in Montreal by the end of July. Each will be assembled in Montreal in the harbor shops and, after preliminary trials, placed in operation on the waterfront. It is not anticipated that all will be in use this season. Rather, it is hoped to have at least two of the new engines working before the end of the season and the balance will be used as soon as navigation opens in 1927.

As practically all the waterfront is now electrified the commissioners feel that the new locomotives will be invaluable in handling traffic there. A total of approximately 70 miles of trackage on the harbor property has been electrified and only a few branch lines need to be transformed before the whole system will be electrified.

Public Controls the Rubber Situation

Present Supply of "High-Priced" Rubber Must Be Exhausted While the High Consumption Continues—Reclamation of Old Rubber Urged—British Sentiment Not Wholly in Favor of Stevenson Act

DESPITE British propaganda to the contrary, the official restriction on the rubber market still continues, according to a recent statement by a well-informed Washington official. While prices have fallen off considerably during the last few months, following the adoption of a policy of limited buying by American consumers, it is believed that much greater reductions will be felt in the future. These lowered prices can only be attained as the American public is educated to the need for careful conservation of rubber and for compliance with the terms of the so-called "buyers' strike," it was stated in authoritative circles.

Since these price reductions may actually be expected with a fair degree of surety it behooves manufacturers with large stocks of high-priced rubber on hand to dispose of them while consumption remains at its present high level. Should they not do so and should the cost of crude rubber hit the toboggan suddenly, practically all of the capital now tied up in these stocks would be wiped out. Certainly a disastrous eventuality such as this is to be avoided if it is humanly possible to do so, and it is the belief of Washington authorities that it can be avoided by prompt action on the part of the manufacturers. At the same time the policy of rubber conservation and of reclamation of old rubber may be carried out to an even more effective extent than is at present the case.

Of course it is necessary for large consumers of crude rubber to make their purchases some distance in advance of production, so that the constant danger of being caught short of necessary supplies for continued normal production may be escaped. However, it is the contention of the committee on interstate and foreign commerce, which has been investigating the crude rubber situation, that these advance purchases should be held to the lowest level consistent with safety. Furthermore, while reclaimed rubber may not be entirely suitable for use in tires, there are many applications to which it may be put with entire success. The policy of conservation has resulted in a very material reduction in the consumption of crude rubber, and the price of that commodity has fallen from a high of $1.10 in November to a slightly fluctuating level between 50 and 60 cents per pound for best grades at the present time.

As stated by the congressional committee, these deliberate controls of commodities violate economic law and produce disastrous economic results both to producer and consumer. The normal improvement in production by cheapening costs is suspended. The committee continues:

> The restriction of production prevents growth to meet future world demands which would ordinarily be the response to high prices. To the consumer it means not only unfair charges but substitution of inferior alternatives. To the manufacturer and distributor it means greatly enhanced hazards, the costs of which are passed on as a further charge to the consumer.

From authoritative Washington sources it was learned that the American public has paid large sums of money over and above the fair price of 36 cents per pound established by the Stevenson act. For the last five months these sums were as follows:

October	$22,000,000
November	26,000,000
December	32,000,000
January	38,000,000
February	35,000,000

The fact that these amounts increased while the actual price of crude rubber was falling is of course due to the fact that supplies had been contracted for several months in advance by the manufacturers. The Stevenson act established a maximum of 36 cents per pound as a fair price to be expected for the commodity. However, as the demand exceeded the supply no real effort was made by the British government to prevent the price from skyrocketing, it was said.

The British rubber industry has at no time been in serious straits, according to the committee report, and there was no apparent need for forcing conditions to their present undesirable condition. During the war many of the plantations earned 50 per cent on their original cost in a single year. Therefore there was not the excuse of bolstering up a weak and shaky industry, which the British government intimated.

It is interesting to note that there is considerable sentiment in England against the Stevenson act, particularly among industrial papers more or less unmoved by nationalistic considerations. Says the London *Economist* of Jan. 30:

> The whole story is an instructive lesson of the ramifications of effect which arise from government interference with the law of supply and demand.

The Malayan *Tin and Rubber Journal* of Jan. 15, 1926, likewise voices apprehension on the score that the recent high prices attained through the operations of the Stevenson plan have unduly stimulated Dutch production:

> In point of fact we are not over-eager to see such prices continue. They have disturbed the working of restriction, stimulated unduly the production in Dutch Indies, and given excuses for the rampage in America which causes wabbling at the knees among the weaker of our own countrymen.

The Westminister *Bank Limited Review* for February says in part:

> The resolution of the American House of Representatives, which at first sight appears to breathe the very quintessence of exclusive nationalism, proves on deeper examination to base its main argument on nothing less than the principles of Adam Smith. . . .
>
> We may conclude, then, that "artificial" national control of raw materials is a theoretically feasible, though not an economically desirable, proposition.

The Manchester *Guardian Commercial Thursday* of Jan. 21, 1926, has an editorial entitled "End Rubber Restriction," reading in part as follows:

> The calmer minds on both sides of the Atlantic seem to be agreed that in the long run government measures of restrictions are always ineffective, and that the most they can hope is to delay, but never to prevent, the operation of economic laws.

The Manchester *Guardian* of Jan. 12 said:

> It does not, of course, follow that we are wise in treating rubber as though we had a monopoly of the supplies and in getting a price for it which is several hundred per cent higher than would give a reasonable profit to the industry. We may not be moved by Mr. Hoover's arguments, but his conclusion may none the less be sound. And in one respect Mr. Hoover's argument is perfectly valid. He draws a distinction between commercial and state-aided monopolies. . . .
>
> The consequence (of the curtailment of British rubber exports under the Stevenson plan) was that the Dutch plantations not only secured the advantage of unrestricted export at prices made possible by the restrictions on the British companies, but were encouraged to increase the area under cultivation. The further result has been that the British supply, which used to be three-quarters of the total, has now fallen to one-half and is likely to fall further.

Expansions Planned in the Twin Cities

The Twin City Motor Bus Company will expend $750,000 in the Twin Cities, Minn., for expansion work. On April 1 work will begin on a $250,000 garage, service station and offices at Chestnut and First Avenue South and the Minneapolis & St. Louis and Great Northern Railroad tracks. About July 1 a similar plant will be erected in St. Paul. This will have the general offices of the line, at a point not selected. Outside the two cities a 550,000-gal. gasoline tank will be built to cost $150,000. One hundred thousand dollars will be spent on buses for the proposed bus line on Lyndale Avenue South from the downtown district to the Minneapolis city limits. Fifteen buses will be ordered for this line.

In the Minneapolis garage the Lyndale buses will be stored and serviced. The Glen Lake buses and half the equipment of the three interurban lines will also be cared for there. The building will be 300x150, concrete and brick at the start. In the St. Paul building will be serviced the remaining intercity buses and those operating to South St. Paul, Stillwater and White Bear points. The Twin City Motor Bus Company is a subsidiary.

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Rolling Stock

International Railway, Buffalo, N. Y., is rebuilding 160 of its cars to increase the seating capacity of each from 40 to 58 passengers. Many of these formerly were double-end cars. They are being made over for one-man operation with an emergency exit in the rear. The first of the cars has already been placed in operation.

Toronto Transportation Commission, Toronto, Ont., has placed an order for ten type Z, 29-passenger Yellow buses with the Yellow Truck & Coach Manufacturing Company. This purchase was based upon the performance of buses purchased a year ago. At that time the company purchased 21 type Y parlor cars and more recently nine additional parlor cars and two of the smaller type X parlor car buses. Three of the present order of ten have been delivered. The seven others will be shipped in April.

Pittsburgh Railways, Pittsburgh, Pa., has just ordered from the Standard Steel Car Company 50 two-man center-exit passenger cars, similar to those now in operation on this line. Electric equipment will be supplied by Westinghouse Electric & Manufacturing Company, while the air brake equipment will be purchased from Westinghouse Traction Brake Company.

Pacific Gas & Electric Company, Sacramento, Cal., will start remodeling eight or ten cars. The company's budget provides $26,000 for this work, which will consist principally in the installation of air brakes.

Rockford City Traction Company, Rockford, Ill., will purchase six new cars of the two-man, one-man type, according to an announcement by Adam Gschwindt, receiver, who has asked the court to empower him to purchase the cars at a cost of $75,000. Bankers have tentatively consented to underwrite a $600,000 bond issue to rehabilitate the line, it is said. The cars will have a seating capacity of 50 passengers.

Montreal Tramways, Montreal, Que., has recently ordered ten type Z, 29-passenger Yellow buses. This is the third order which this company has placed with the Yellow Truck & Coach Manufacturing Company for this type of vehicle. Originally the company ordered four buses, which were followed later by another order for four. This recent order brings the total number up to eighteen of this type and manufacture.

Washington Railway & Electric Company, Washington, D. C., has petitioned the Public Utilities Commission for permission to purchase fifteen one-man cars of the latest type for service on the Wisconsin Avenue line. A storm of protest against one-man cars several months ago resulted in an order preventing the company from adding any more cars of this type on its lines. The company meets this ruling by offering to junk fifteen one-man cars now in service. The cost of the new cars will total $202,500. They will be equipped with both front and rear exits. The fifteen cars to be junked, should the commission act favorably on the petition, are of the front entrance and exit type.

Virginia Electric & Power Company, Richmond, Va., expects delivery of fifteen motor passenger cars, ordered from the American Car Company, St. Louis, Mo., by April 10. The order was placed on Dec. 15, 1925. Specifications follow:

Type of car	Semi-convertible
Seating capacity	44
Weight	30,000 lb.
Bolster centers, length	18 ft. 0 in.
Length over all	40 ft. 1 in.
Truck wheelbase	5 ft. 1½ in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	11 ft. 0 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse Traction Brake
Axles	Brill
Bumpers	American Car
Car signal system	Faraday
Car trimmings	Statuary bronze
Center and side bearings	Brill
Compressors	Westinghouse
Conduits and junction boxes	American Car
Control	Westinghouse
Couplers	American Car
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fare boxes	Johnson DM 3
Fenders	H. B. lifeguards
Gears and pinions	Westinghouse
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Ohio Brass
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors	Four Westinghouse No. 508, inside hung
Registers	International
Sanders	Ohio Brass
Sash fixtures	O. M. Edwards
Seats	Brill
Seating material	Plush
Slack adjuster	Westinghouse
Springs	Brill
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trucks	Brill No. 77 EX
Ventilators	American Car
Wheels	26-in. rolled steel
Special devices, etc.	Westinghouse variable load brakes

Trade Notes

William A. Edwards, branch manager of the Chicago territory for Ludlum Steel Company, Watervliet, N. Y., has been transferred to take charge of the southwestern territory with headquarters at Houston, Tex. This territory has grown to such magnitude as to require the services of one of Ludlum's most efficient managers.

Charles E. Criss, for the past three years in charge of sales for the General Tire & Rubber Company over a large portion of the State of Ohio, has been promoted and made branch manager at Los Angeles. Born and educated in Akron, Mr. Criss has had a wide experience in all branches of the rubber industry. Mr. Criss has left for the Coast to take up his new duties.

R. B. Fisher, formerly general sales manager of the Buda Company, Harvey, Ill., has been appointed vice-president of the company. In his new work he will have charge of the sales and engineering departments of the railway division.

J. S. Applegate, formerly of the Wagner Electric Corporation, has become associated with the Sterling Varnish Company, Pittsburgh, Pa. Mr. Applegate is a metallurgist by training and, as a materials and process engineer, has for years been conducting considerable research work in the testing, selecting and application of liquid and solid insulators. It is understood that he will be attached to the Pittsburgh office and plant, with the title of metallurgical engineer, as an additional consultant for the users of insulating varnishes and technical coatings.

Fageol Company, Kent, Ohio, delivered three gas-electric chassis to the New Orleans Public Service Corporation, New Orleans, La., in February.

General Railway Signal Company, Rochester, N. Y., has received a contract from the New York Rapid Transit Corporation, Brooklyn, N. Y., for 6.4 miles of signals, including color-light signals, to compose an automatic block system with automatic train stops to be installed throughout.

New Century Signal Corporation, Albany, N. Y., designer of signaling devices for railroads and autos, has been chartered at Albany with a capital of $100,000. G. B. Snyder, 57 Maiden Lane, Albany, N. Y., is attorney for the corporation.

Nichols-Lintern Company, Cleveland, Ohio, has found it necessary to increase its factory space and install special machinery to meet the demand of N-L ventilators, universal lanterns and other products.

Leo M. Dunn has been made vice-president of the Graybar Electric Company, formerly the supply department of the Western Electric Company. He will have charge of the merchandising and accounting phases of the new corporation. Mr. Dunn's association with the Western Electric Company has extended over a period of many years. His first position was in the capacity of office boy with the Central District Printing & Telegraph Company, Pittsburgh. This connection was formed in March, 1886. Stepping into his first supervisory job at the age of nineteen, Mr. Dunn started on a career of increasing importance in the distributing business of Western Electric.

Locke & Company, Detroit, Mich., manufacturers of passenger car and bus bodies, will move from Detroit to Rochester, N. Y., within a few weeks, according to an announcement by the Rochester Chamber of Commerce. The Locke company has purchased the former Symington Company munition plant in the Kodak City and already begun the installation of machinery. The plant will employ 1,000 persons. It plans to manufacture custom buses on a considerable scale as well as bodies for passenger automobiles. Officers of the company are Charles Fleischmann, president; Louis L. Breden and Newton H. Manning, vice-presidents; William C. Miller, secretary, and N. A. Gorman, treasurer. Mr. Manning will be in direct charge of the Rochester plant. He was formerly with the Rolls-Royce Company. Duncan G. Stanbrough will be factory manager.

H. C. Osman, sales manager of the Nugent Steel Castings Company, Chicago, Ill., has been elected secretary of the company. He will continue to have charge of the sales for the company. C. A. MacDonald, former secretary, has been elected treasurer.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

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New York's Municipal Trolleys Make a Sorry Record

NOT many transportation companies can afford to run up an operating deficit of $717,508 in five years. That is what the city of New York has done in managing the 32-mile railway system with 6.3 miles of trackless trolley that it took over in the Borough of Richmond (Staten Island) after the owners had failed to make it successful under the conditions of operation imposed by the city.

A brief review of the situation is pertinent. The Staten Island Midland Railway was one of the two street car systems that for many years gave local transportation on the island. It was formerly owned by the H. H. Rogers estate. After the cessation of war activities, which had caused a fair amount of traffic, both this and the other railway line found it impossible to carry passengers at a 5-cent fare. Their repeated pleas for an increase were consistently refused in Shylock fashion by the Hylan administration since the franchises called for that rate. Finally the two systems ceased operation.

In order to give some kind of transportation in the emergency, Hylan marshaled together a miscellaneous collection of buses, which were run by their private owners at a 5-cent fare until they found operation unprofitable and quit. In order to make good on its promises to keep the low fare the city took over the Midland line and resumed operation at the franchise rate of 5 cents. A trackless trolley line to reach a hitherto unserved section was constructed and opened with a great flourish. Some new Birney cars were purchased and old cars of the former company were revamped. For a time it looked as though the city had been able to accomplish what the private operators could not do.

The city refused consistently to make public a balance sheet or true operating costs of its system. It was only after the overthrow of the Hylan régime that the true cost was published. The figures were given in detail in a report by Comptroller Berry, abstracted in the news columns of this paper for March 20. In the five years up to the end of 1925 the surface railway cars had taken in $2,171,907 and had spent all that and $371,276 more. Bad as that was, it was as nothing compared with the record of the trackless trolleys, which in about the same period took in revenues of $210,400 and according to the city's engineers had an operating loss of $346,232.

Operating figures do not tell the whole story. The trackless trolley system is nearly worn out. It has been necessary for the city to provide new paving for the roadway over which it runs. The bonds of the railway, amounting to $1,000,000, come due next June. It will be necessary to invest additional funds for the purchase of new cars, construction of track, a substation and a carhouse, totaling between $1,500,000 and $1,750,000.

As an easy way out, it has been proposed that the city abandon operation and issue permits to a private bus company, with a fare sufficient to meet the cost of service.

Repetition of New York Fiasco Should Be Avoided Elsewhere

CASTING about to find a motive for the expenditure of such sums of money as those wasted in the municipal operation on Staten Island, one is at a loss, except that it was a means of fighting the hated "interests." But to show their attitude, residents of Staten Island living along the lines of the other company made a gentleman's agreement to allow it to charge a fare of 8 cents. That rate has been in effect for several years now, and the company has given service that is far better than the city's, while paying operating expenses.

The claim of the former administration that the municipal operation was necessary to permit development of the territory has not been borne out. Comptroller Berry in his report sees no likelihood that increases in population will be such as to put the system on a self-supporting basis. In some cases gain in property valuation might justify operation at a loss, but here it would not.

It should be stated that the system has not been maintained or operated in a manner which would be permitted of any private operator. The cars are dirty and ill kept. Schedules are insufficient to meet the demands at certain periods, and no attempt is made to maintain them. Failures are a matter of common occurrence. Ordinary courtesy is not observed by the trainmen and others who come in contact with the riding public. In brief, there is no inducement to ride from any motive other than that of necessity.

This, then, is the record of an experiment by the greatest city on the western continent in municipal transportation. With its immense resources, the administration was able for a time to cover up the huge losses. The futility of this was apparent when a new administration made public the facts. No situation exists that justifies the city in spending 12.2 cents to secure a nickel car fare, as it does on the trackless trolley line.

The entire affair carries a message to any other city contemplating municipalization of its transportation facilities. When private capital is willing to furnish service at a reasonable fare and with reasonable regulations, why not let it do so? Even with all the faults that municipal ownership zealots ascribe to private operation, it certainly is far ahead of the record of New York in the Staten Island lines.

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Looking Ahead in Establishing Bus Rates

ELECTRIC railways have had a long and sad experience with the principle of a fixed rate of fare. Many receiverships occurred before any progress was made in shaking off the association between a 5-cent fare and a street car ride that had been allowed to grow in the public mind. Even now, in New York and many other cities, the fixed fare stands in the way of good transportation service.

In discussing the recent bus proposals for New York, the *Wall Street News* suggests editorially that it might be worth while to consider how much street railway service could be improved in that city with a 10-cent fare. It is not difficult to predict what could be done, but it has never been possible to bring such improvement about. The 5-cent fare has hung on in New York despite all efforts to dislodge it.

There is today serious danger that the bus will not profit from this example. Those who are really interested in the future of this new transportation vehicle may well view with alarm the tendency to drive bus fares down to a minimum.

It is unquestionably a serious mistake to permit the bus to be considered generally as a street car on rubber tires. It has a much broader destiny. It is capable of rendering a distinctive service providing ample rates are permitted. Promoters who are eager to compete with street cars and who point to the bus as the future mass transportation agency are not friends of the bus. Their perspective is limited. They see only the immediate at the expense of the future. Progressive bus men are looking ahead in establishing bus rates.

Cleveland Co-ordinates the Bus Without Affecting Street Car Traffic

THAT the Cleveland Railway should adopt the bus is entirely in harmony with the policy of progressive management that has held this company in the foreground for the last fifteen years. Neither its officials nor the people of Cleveland believe that the bus will supplant the street car. They do believe, however, that the bus will bring back business lost ten years ago or will create new business developed by the private automobile.

Three distinct ideas form the basis of the Cleveland bus operation: First, feeder service or extensions of car lines into newly developed areas; second, crosstown service to provide ready means of movement between outlying areas, and third, a purely supplemental service on heavy street car routes or immediately adjacent thereto. Early results indicate that the feeder or extension service does not pay any better than the tail ends of street car lines and their operation must be considered as related to the whole project. This is told in greater detail in an article in this issue. Crosstown service pays somewhat better and is much appreciated in a city such as Cleveland that has so many residential areas lying on the outskirts of the city itself. As decentralization takes place a demand for intercommunication naturally develops. Buses, or "coaches" as they are called in Cleveland, provide a splendid vehicle for this service.

The most important service, however, from the standpoint of volume and potential profits, lies in the supplemental line of double-deck coaches on the Carnegie-Clifton route passing through the Public Square from the eastern to the western city limits. This service paid more than 44 cents per mile during the lean month of January and its use is increasing. No apparent effect has been noticed on the car lines it parallels. This bears out the theory that high-class coach service will draw from traffic sources lost years ago or else it will develop its own clientele from Mr. Wickwire's "Automotiviks."

J. H. Alexander, vice-president of the Cleveland Railway, has said that the consummation of present plans will probably mean a more rapid acquisition of coaches in Cleveland than cars. This is because the coaches will be used to provide the extension service that Cleveland needs today. New cars will be bought for replacements, and eventually, as electric car extensions prove economical in fields developed by the buses, more cars will be used.

Rubber Urge Is Too Strong

"DOUBLE-DECK PEEPERS" is the latest aspersion cast upon the bus, the perennial object of encomiums, and the target of the jeers in a sometimes faultless and other times faulty transportation world. In turn, the bus has been heralded as the panacea for all ills and as the strongest deterrent to traffic flow, as the cheapest means of handling masses and as the most expensive system, as the successor to the railway and as its supplement. In addition there are many specific complaints—the bus as a vehicle is a menace to safety, a veritable Babel to the meditative soul and a destroyer of pavement and plaster. Not long ago the buses were scored because they were the scene of amorous amenities where young men refused to restrain their exuberant spirits and the result was a "buss" on a bus. For a while the censors (all married men) were on deck and the young men were remiss in reminiscence only.

But now the latest wail is so loud that it has reached the ears of the commission—sightseeing rubbernecks peer into bedroom windows, taking away all privacy from second stories. Of all problems before the traffic authorities this would appear to be the most insoluble. The residents can't keep their shades down always nor can they recondition their homes so that those on the espial might only become acquainted with the recipe for mixing grapes and cider instead of the art of harmonizing Madame Brunette rouge and Manon Lescaut powder. And why penalize the residents? It's the bus rider who is guilty of the unpardonable sin of peeping.

The traffic managers, after the manner of immigration chiefs, might exact certification of good morals from all aspirants for the upper bus level. But such segregation would be discriminatory and deleterious in effect, for the original complainants would become the new offenders peeping out of the much-maligned bedroom windows. Then all illusions would be destroyed in the knowledge of how the other half of the world lives and the second predicament would be worse than the first.

Perhaps a compromise might be reached whereby the residents would supply shades for the buses with the bus management promising "all shades down" at the psychological minute. Just as that ever alert and solicitous conductor admonishes the rider "keep your seat, low bridge" he might also cry "shades down, roll your eyes." If co-ordination of thought and speech ever failed him—well, embarrassment must be suffered

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by all at times, even by the commissioners themselves who must settle these ever-perplexing questions. Of course, the commissioners might divert bus traffic to broader thoroughfares, but why can't both the bus rider and bedroom complainant be like Cæsar's wife—above suspicion.

Noise Elimination Is an Asset in Public Relations

NOISE is generally the earmark of wasted energy. It is more. It is wasted public relations. No amount of advertising or publicity can counteract the rattle of a car in bad order on a stretch of poor track.

A noted operator of public utilities once wisely said that the physical property of a railway was too much in evidence. A passenger comes in daily contact with two or more employees, pays out money several times a day, rides in several of the cars, and sees all of the others pass him on the line. He sees and is otherwise aware of the track, and possibly sees the car shop and a good part of the power distribution system along the route of his trip. This, of course, makes an invidious comparison with the gas or light and power companies whose equipment and personnel is so little in evidence and whose service is paid for only once a month by the customer.

With no immediate likelihood of being able to submerge the equipment and personnel so that they are out of sight and hearing, the next best thing that can be accomplished by railway operators is to make the equipment more pleasing to eyes and ears. So no effort should be spared to reduce the unpleasant noise of operation.

Much has been accomplished along these lines, but much more remains to be done. The automobile is a bogey to shoot at. Perhaps it can be bettered. Nothing is impossible with the combination of right thinking and a desire to win.

Massachusetts Has Pointed the Way to Pennsylvania

GOOD reasons aplenty can be found for opposition by electric railways in Pennsylvania to the Reading Railroad's plan to run buses in competition with them. These reasons are time worn, but they hold today just as well as when they were evolved. The Pennsylvania Street Railway Association, as indicated in this paper for March 20, has summarized its contentions in the proposed appeal to the commission of that state against the Reading road. Ordinarily, one would say that if the projected routes were likely to work to the detriment of the electric railways to the extent that their representatives believe, the commission would be in duty bound to disallow them. If that be true, then it would seem that the Reading Railroad officials were guilty of a *faux pas* in seeking such rights.

Here, then, is a case not for argument, but for conciliation. Massachusetts had a similar problem. Before the law could catch up with events there, competition between steam and electrics over bus territory appeared to be in prospect that would have been ruinous to both. At first the disposition was to fight. Conciliation finally prevailed, best exemplified, perhaps, in an understanding about the division of territory reached by the Eastern Massachusetts Street Railway and the New York, New Haven & Hartford Railroad.

With due respect to all the parties concerned in the Pennsylvania proceeding, it does appear a bit incongruous that contestants who know so well the economic principles involved should find themselves opposed to each other before a state board or any other such body over a question that is so vital to them. Where there can be nothing but agreement between the principles over the fundamentals that are involved there should be no room for disagreement over the application of the principles. Pennsylvania would do well to take the Massachusetts settlement seriously to heart. It will pay the steam road least of all to be pugnacious.

The Extent of Co-ordinated Service in New Jersey

SIGNIFICANT, indeed, are the figures contained in the annual report of the Public Service Railway of New Jersey, digested in the issue of March 20. They show the extent to which the bus is being used in co-ordinated service in the territory served by that company. The number of bus passengers carried has increased from 1,952,059 in 1923 to 69,383,643 in 1924 and 146,053,237 in 1925. More significant is it that the total of passengers carried by both trolley and bus in 1924 was 497,212,087 and in 1925, 562,841,858. The previous high year for trolleys alone was 1917, when 476,974,983 passengers were carried.

Important as are these figures of the extent of the bus service, sight should not be lost of the diversity of this operation. It is true that this story has been spread before the industry in articles in the JOURNAL and that it was told at Atlantic City, but the report to the stockholders spreads the facts before those who are financially interested in the company and before the public which it serves, many of whom have been converted into partners in the enterprise through customer ownership. Even though to those in the industry much of the material contained in the report is not new, the recapitulation of the figures furnishes material for placing the matter in the proper perspective.

So far as the general aspect of the situation is concerned it, in a way, is contained between the lines of the printed report. There is a hint of it here and a hint there. But these hints are better even than the picture would be were the attempt made to paint it in bold relief. One little scrap of information sometimes tells a whole story. Such a scrap is the reference to the purchase of 333 buses at one clip to replace obsolete equipment acquired from previous bus operators. Another, with perhaps an even more colorful character, is the statement that at one point on the system there is a 140-bus garage and that at many other locations buses and street cars are housed under one roof in improvised quarters. All these give some idea of the magnitude of the problems being encountered in co-ordinating rail and bus.

The company is doing its part, just as it said it would. The problem now has resolved itself into one of economical and at the same time efficient operation. In many respects the company has about reached the limits to which, unaided, it can go. It wants greater co-operation from the communities which it serves. To this end it has entered the well-made plea that better traffic regulation be enforced and that the company be relieved from unfair paving requirements. It is a fair plea against an unfair practice—a plea that in the end it is more important be heeded in the interest of the public than in that of the company.

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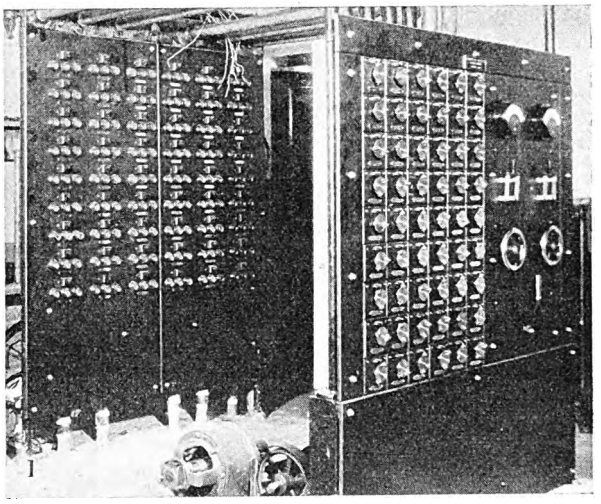
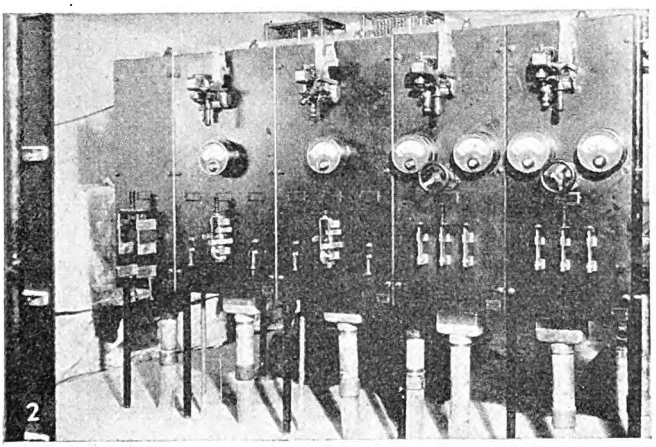
Carefully Planned Mechanism Controls the Chicago Traffic Signals

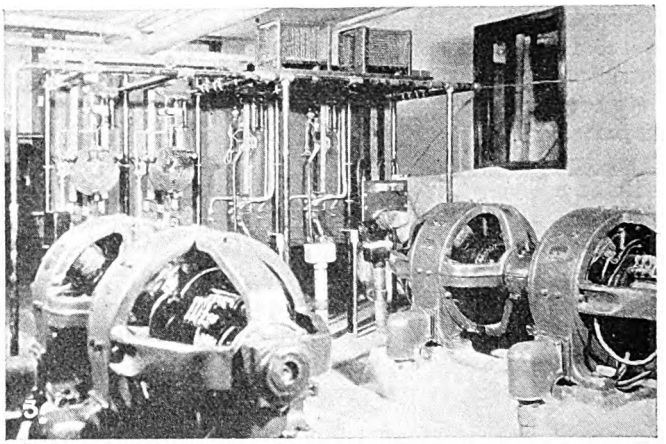


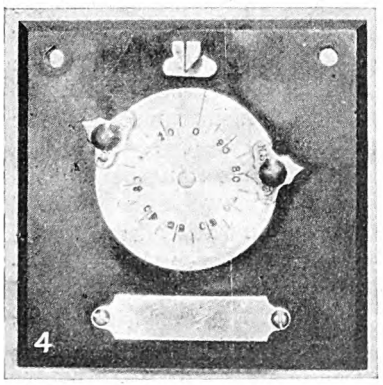
1. Front view of relay panel and behind it the individual fuse plugs placed in each circuit leaving the control tower. Both relays and fuse group controlling each intersection are placed in the same order that they appear on a map of the Loop. On the front panel may be seen the handwheels that control the duration of the cycle, the time in seconds being indicated by the meters at the top of the board actuated by small tachometers attached to the gear train. The lever at the bottom of the panel actuates the clutch that connects one driving set or the duplicate.

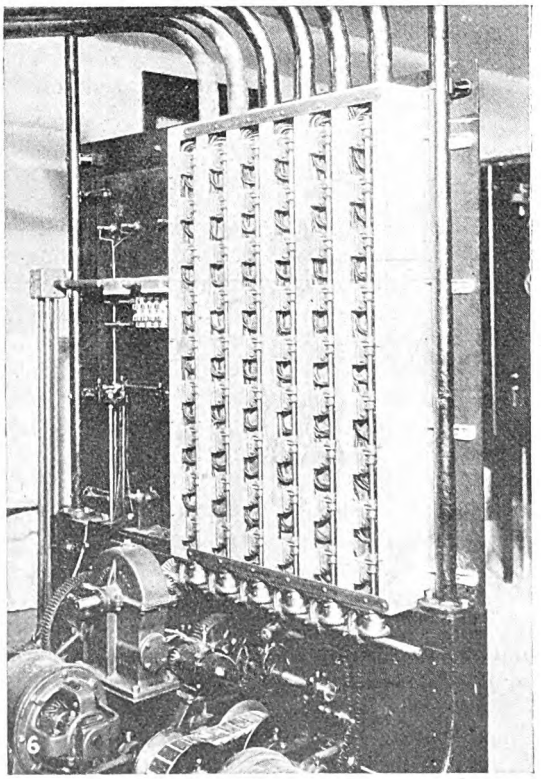
2. Front of the switchboard controlling the two 40-kw. Western Electric sets used to supply energy to the traffic control lights.

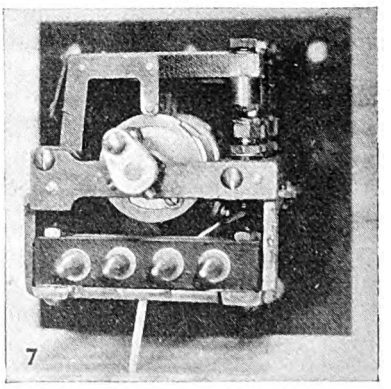
3. Two 40-kw. motor-generator sets and back of controlling switchboard used to operate Chicago's co-ordinated traffic control signals.

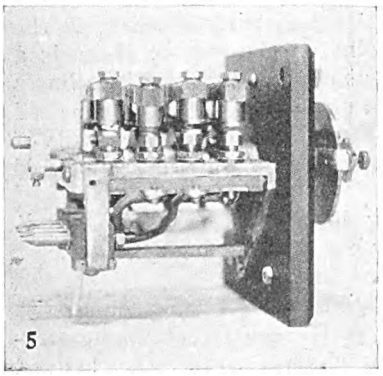


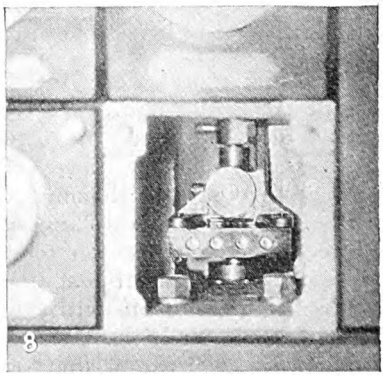












4. Face view of an individual relay removed from the main board. The space between markings on hands "NS—NS" is the proportion of time allowed for north-south movements across the intersection that this relay controls. The balance of the cycle is for east-west movements. The hands are adjustable and control the setting of cams which operate the contacts.

5. Side view of an individual relay showing the four individual contacts. Three of these contacts are raised, and one is closed in this picture.

6. Rear view of the relay bank. The duplicate motor drive may be seen. Note the horizontal operating shaft bevel geared to the vertical shafts, which in turn actuate each individual relay through a small bevel gear. All bearings are supplied with oil cups.

7. Rear view of an individual relay showing the cams, and the crankshaft that fits into propelling mechanism, and the four plug contacts.

8. The control board looking into the recess in which is housed one of the operating relays.

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Co-ordinated Lights and Rerouting Speed Up Chicago's Loop Traffic

First Month's Operation of Traffic Signals of New Design Prove Very Satisfactory—Rerouting and Elimination of Left-Hand Turns Accomplished More than a Year Ago Was the First Step in Accelerating the Loop Traffic—The Two Steps Together Have Resulted in 50 to 80 per Cent Increased Speed of Movements

By John A. Dewhurst
Associate Editor ELECTRIC RAILWAY JOURNAL

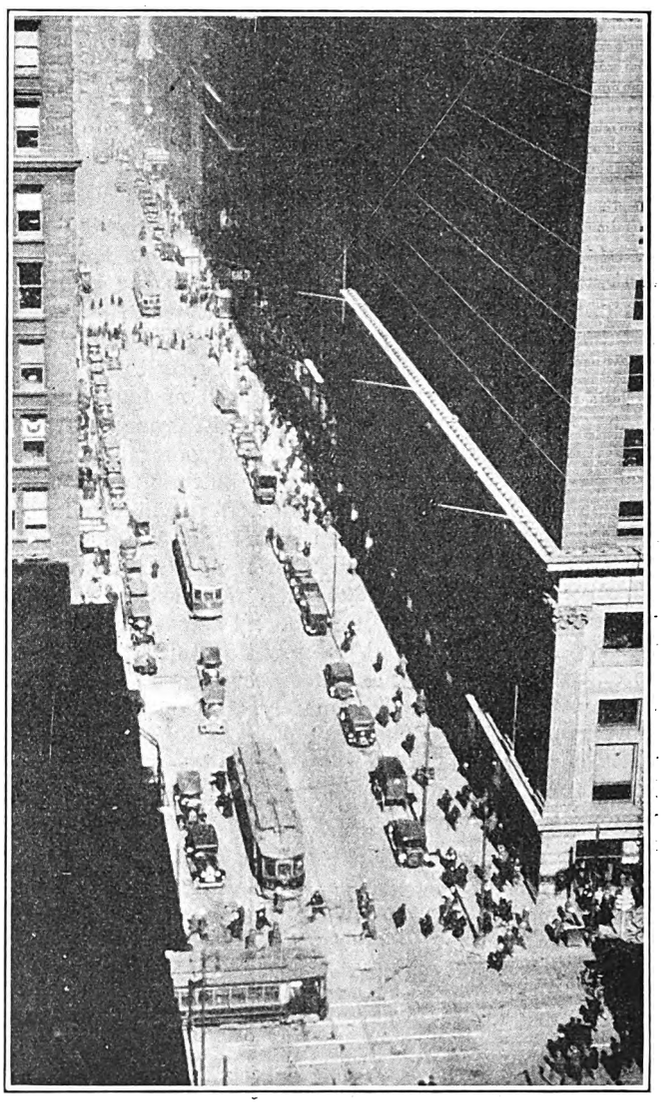
CHICAGO'S Loop has had a second major operation performed upon it which after one month's trial has so speeded up the car and vehicular traffic that much of the congestion has been eliminated. This improvement is not theoretical, but an astonishing fact that can be readily observed by any visitor familiar with previous conditions. The operation was simple, consisting of the installation of an automatic but non-synchronous system of traffic control lights, the sequence of operation having been first determined by engineering studies based on traffic checks continued for more than a year.

While several minor changes have been made during the first month, the system worked and worked well from the time the master switch was closed on Feb. 8. Many checks made during this first month show that movements through the Loop have been speeded up from 25 to 50 per cent by these traffic signals alone. Cars that formerly required from eight to twelve minutes to cross the Loop now require from five to six minutes.

This saving, combined with the rerouting plan made effective late in 1924, has speeded up Loop traffic from 50 to 80 per cent and is equivalent to adding this much more capacity to the streets of central Chicago. These signals are believed to have possibilities for use on high-speed boulevards that promise revolutionary increases in speed of movements over that possible with the synchronized system that requires positive stops every so often. It is not claimed by those responsible for the installation that the exact layout used in Chicago will fit any other situation, but the principle of this co-ordinated control can be adapted to other conditions with equal success.

Every schedule of the Chicago Surface Lines that controls cars passing through the Loop must be reconstructed to cut the slack time from Loop movements—an imposing task in itself. Approbation is heard everywhere. Newspapers are unanimous in their approval of the system. Individual talks with numerous police officials in the traffic department, taxicab drivers, individual car operators, motormen and others who for years have battled with the old system of police whistles and individually controlled corners are unanimous in their approval of the system. It is not an uncommon occurrence to drive through the Loop from one edge to the other without a stop or shift of gears even in the busy hours of the day.

The first impression in driving through the Loop is that of a perfect "break" of luck, the lights changing to green just as the approach to the corner is made or staying green until the crossing is made. The traffic officers, who a month or more ago were risking their lives while they lustily blew their whistles so familiar in Chicago, are now busy regulating pedestrians, the only kind of traffic that won't be governed by the lights. Instead of the whistles one now hears "watch the lights."



Clark Street, Chicago, Looking North from Office of Chicago Surface Line. Intersection in Foreground Is Adams and Clark. Picture Was taken During the Noon-Day Period

A second natural impression is that there are not as many vehicles in the Loop as usual. To be sure

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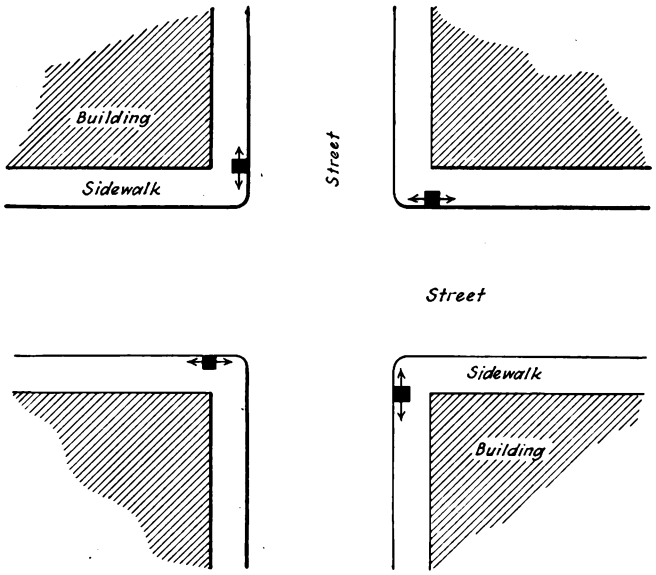


Typical Street Intersection
Showing location of traffic lights with respect to sidewalks and building lines in the Chicago Loop.

there aren't, because they pass through and out about twice as fast as formerly. Another impression that bewilders the traveler trying to see how it is done is that an observation up one street shows the lights at the different intersections blinking first red then green without any apparent relationship one to the other.

A study of the system leads one directly to the offices of the Chicago Surface Lines as well as backward in time at least two years. Under the generalship of G. A. Richardson, vice-president and general manager, and in conjunction with the city officials, a complete rerouting of car lines was effected which eliminated left-hand turns in the Loop district and reduced the right turns to a minimum. After this rerouting became effective on Sept. 14, 1924, the improvement was so noticeable that the city ordered all left-hand turns of vehicles eliminated about one month later. The cost of special work and track changes necessary to accomplish the rerouting was approximately $150,000. Based on movements of street cars at intersections this improvement gave a time saving estimated at 27½ per cent. Many time studies of street car operations showed the various times of movements at intersections averaged the following before the rerouting:

	Time Through Intersection, Seconds	
	Single Car	Motor and Trailer
Straight across.....	10	14
Right hand turn...	15	20
Left hand turn.....	20	20*

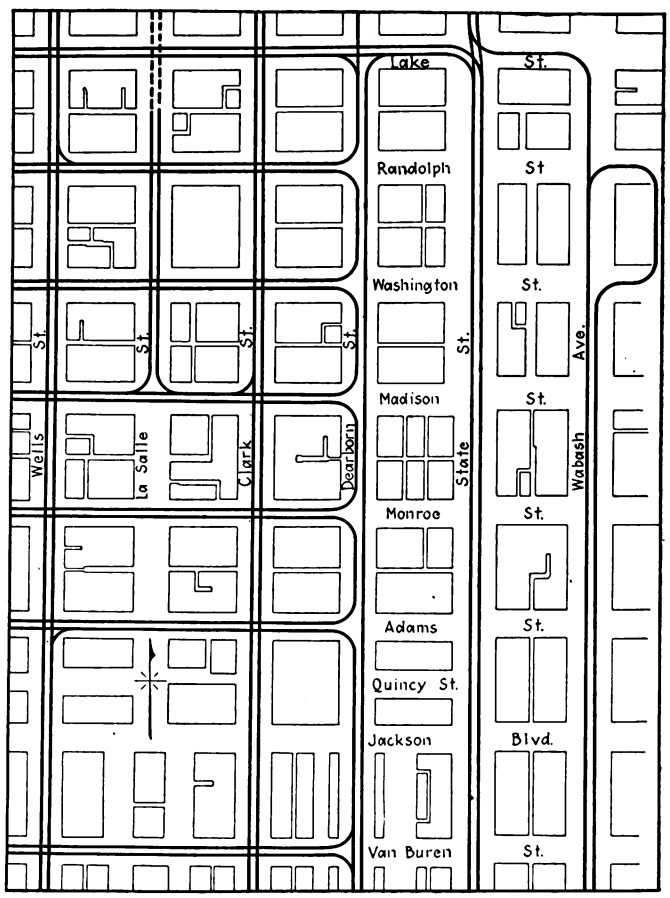
*This low value resulted from the fact that no left-hand movements of trailer trains were made in the center of the Loop, but only at the edge, where congestion was less.

Elimination of left-hand turning movements was considered desirable to the proper control of traffic under any system. This accomplished, the city announced its intention to install a system of traffic control lights. The problem was turned over to the traffic committee of the Association of Commerce. A sub-committee was formed to which E. J. McIlraith, staff engineer of the Chicago Surface Lines, was appointed. Mr. McIlraith designed the system with the assistance of H. B. Cammack, traffic engineer of the Surface Lines. To these men belongs the credit of applying engineering principles to the control of one of the worst traffic situations in the country.

While the Loop is an intangible area in Chicago, in this discussion it is bounded by the streets over which the elevated loop line is constructed—Lake Street on the north, Van Buren on the south, Wells Street on the west and Wabash Avenue on the east. Technically, this is the Loop. Following the order of Sept. 14, 1924, and the vehicular order two months later, left-hand turns are allowed on these border streets except Wells, but no parking. Inside the Loop no left-hand turns are permitted but limited parking is allowed. The traffic control system discussed in this article is confined to the intersections within this area and on the bordering streets, 49 in all.

Apparatus Allows Great Freedom of Control

Of primary interest is the scheme of establishing the inter-relation of signals controlling the traffic lights at the intersections. The signals themselves are not unusual, consisting of three-lamp standards, one at each corner of an intersection, the illuminating signals facing in opposite directions as illustrated in the sketch. The usual colors of red and green for "stop" and "go," with amber for an intermediate signal, are used. From each lamp standard emerge the five control wires that operate the three different lamps. The five wires from each of the four standards at an intersection are interconnected. In this way five wires operate all lamps at one street intersection, theoretically in the same



Tracks Used Daily in the Chicago Loop
Preliminary to the design of the co-ordinated traffic flow signal system, Chicago eliminated left-hand turns for cars and vehicles except on border streets. This map shows the present routing and trackage to scale that is used in daily operation. Other tracks and special work have been omitted for simplicity. Only two left-hand turns for cars are used on border streets, although vehicles may make such turns at any intersection on Lake, Wabash or Van Buren.

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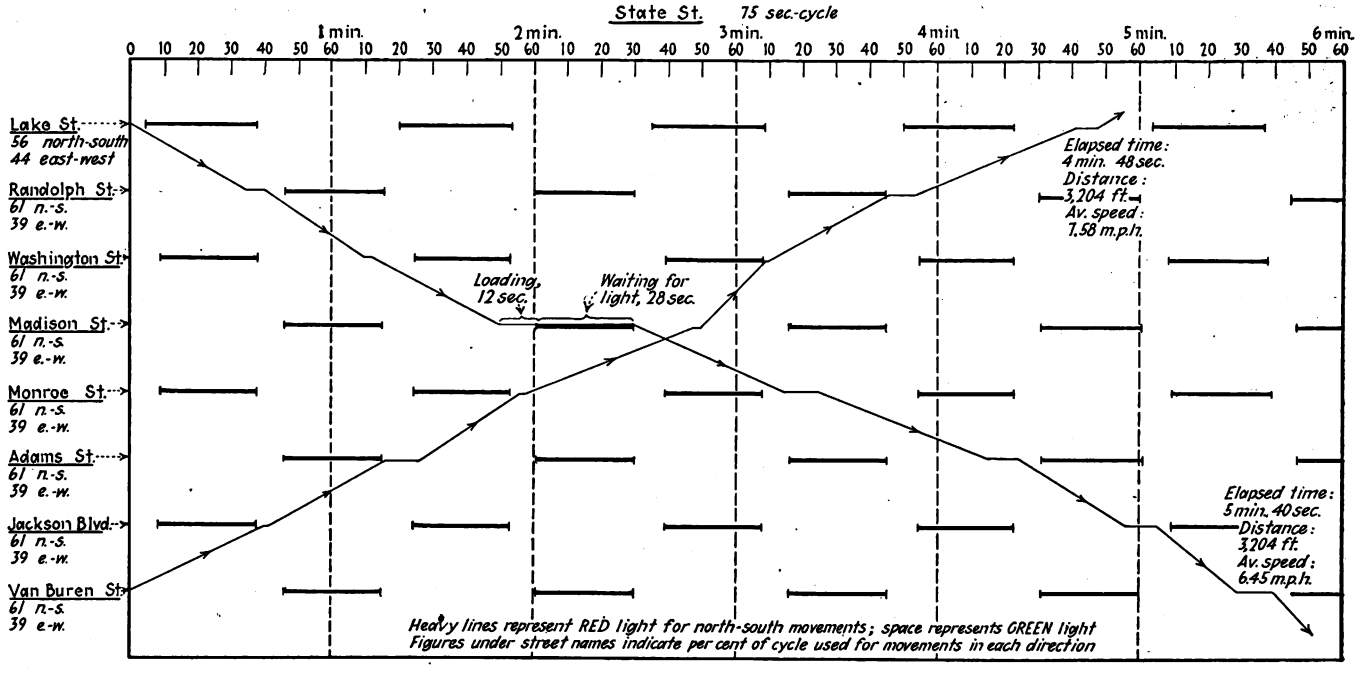
manner as if the intersection were controlled by a single set of three lights hung from span wires over the center of the intersection. While four wires are enough electrically to operate the three lights, the fifth wire acts as a neutral for the amber lights, thus avoiding a change in brilliancy when the amber lights burn coincidentally with the red or green.

The operating wires from each intersection are carried underground to the control room in the basement of the City Hall. Each set is connected to the terminals of an individual relay. On this control board are mounted 54 relays in a bank, six wide and nine high. Each relay is the control for an individual intersection. a minimum. In this way the action of the 49 individual relay shafts is synchronous and each completes one revolution in the predetermined time-cycle of operations that controls the entire system. The individual cams, however, can be controlled separately from the face of the relays and can be co-ordinated in their relationship of operation.

Consider any one instant as zero, for the system as a whole. The cams controlling the contacts of each relay can be rotated on the face of each relay and set, so that the point of starting a north-and-south movement, for instance, may have a plus or minus time relationship to that of any other. Likewise, the pro-



Typical Chart Used in Designing the Chicago Traffic Light System

Two typical car movements are traced through the Chicago Loop. Readings are taken from checks made on State Street, which runs north and south. The first car enters the Loop (lower left-hand corner of chart) at the beginning of the permissive signal for north and south movements, requires 41 seconds to arrive at Jackson Boulevard, stops there one second and proceeds to Adams Street, 71 seconds after entering the Loop. Here eleven seconds is required for loading and discharging of passengers, but the light controlling the intersection is green and the car proceeds across eight intersections without once being held for lights.

A southbound State Street car picked at random from the company's check enters the Loop at Lake Street and crosses the intersection on the tail end of the permissive light. However, this car progresses without delays until Madison is reached. Then it is held twelve seconds discharging and loading passengers and just misses the light and hence is delayed 28 seconds. Now the car is in step and passes through the Loop with no further delays. It is only chance upon entering the Loop whether on the beginning or the tail end of the permissive signal. If on the tail end the chances are that one delay will take place.

Since there are only 49 intersections in the Loop five relays are spares. In case of trouble, these can be interchanged in a few seconds time. The arrangement of these relays on the vertical board is in exactly the same order as they would appear on a street map, so that an operator familiar with the streets in the Loop district can readily find the relay controlling any intersection.

The propelling mechanism, consisting of a 1-hp. electric motor and gear drive, is in duplicate and is mounted at the rear of the relay rack. A single throw of a lever disengages one clutch and throws in the other motor and gear reduction drive. The speed of the motor is reduced by a set of gears that drives a horizontal shaft along the bottom of this relay bank. A vertical shaft driven from the lower horizontal shaft through bevel gears rises just behind each vertical tier of relays and propels each one separately. The four electrical contacts of each relay consist of coin silver points, the upper one in each case being raised or lowered by cams on the individual relay shafts. Condensers wired across the contacts reduce arcing to

portion of time can be changed at will so that the north-south movement may be given 40 per cent of the time elapsed in the cycle and the east-west 60 per cent, or 35 per cent and 65 per cent, or 75 per cent and 25 per cent respectively, or any other desired rate.

By means of a variable speed control device (Reeves drive) between the propelling motor and the main driveshaft the duration of the controlling cycle for the system can be changed at will to meet the demands of traffic in different periods of the day. At present the base cycles used are as follows:

7:30 a.m. to 8:00 a.m.	60 seconds
8:00 a.m. to 9:00 a.m.	70 seconds
9:00 a.m. to 4:30 p.m.	75 seconds
4:30 p.m. to 6:00 p.m.	80 seconds
6:00 p.m. to 12:30 a.m.	60 seconds

Saturday the longer cycle is used beginning about noon and on Sundays a 60-second cycle period is used. This schedule is subject to change, being dictated by traffic demands only.

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State Street, Chicago, Looking North at 4:15 p.m. on a Monday in March

This snapshot was taken just after the intersection from which the picture was taken was cleared of north-south traffic and just at the time the intersection to the north started to move north and south. Note the apparent absence of traffic, an impression created by the greatly facilitated traffic movements.

The entire installation of equipment cost approximately $230,000. The lamp standards were designed by the architects, Graham, Anderson, Probst & White. The control equipment was manufactured by the Harrington Seaberg Corporation of Moline, Ill. The power supplying the lamps is direct current obtained from two (one a spare) 40-kw. Western Electric motor-generator sets designed for flat compounding and installed in the control room.

Incoming wires come to a terminal board erected behind the relay bank and are fused individually, so that a short circuit on any wire can only put out of commission the lights at one intersection controlled by the wire affected. In order to overcome the line drop to distant points and to allow all lamps to burn at normal brilliancy, resistances of the proper value are inserted in nearby circuits. These are wound on tubes and screwed into standard Edison sockets.

This somewhat detailed description of the equipment is given in order to visualize the system. It is really putting the cart before the horse, because the apparatus was designed to fit the kind of a system deemed necessary to accomplish the desired results.

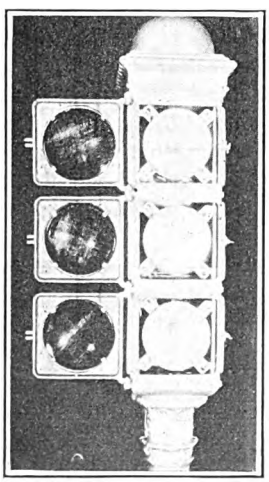
Because of the narrow streets in the Loop only in a few instances are safety zones used. At corners where there are no safety zones vehicular traffic must wait behind loading street cars. In a sense the cars control the speed of all traffic, and it was of prime importance to move them with as little delay as possible. Besides, as in most cities, the street cars carry more than three-quarters of all the persons riding in vehicles of all kinds.

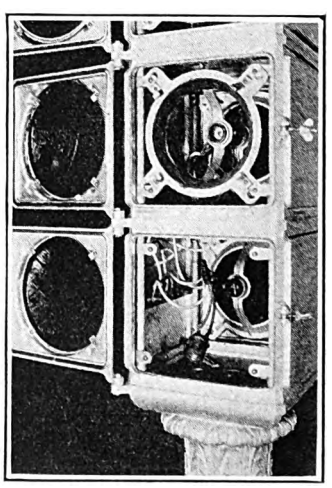
For this reason the lights are designed primarily to move the cars—not to stop them. A car entering the Loop may find the light green or else may have to wait. Once it passes the first light, it is then in step with the co-ordinated system, unless it enters at the end of the permissive signal. The car then takes the normal time to arrive at the next corner and consumes the allotted time plus about ten seconds to load. The second light changes to green. Again the process is repeated and after the third corner has been reached and passengers discharged and loaded this light also is green, and so on through the Loop. In this way waiting for traffic signals is greatly reduced and the time thus saved is responsible for the faster movement.

The normal time required for a car to move from one block to another plus the normal time for loading and discharging of passengers has all been previously determined by many painstaking checks and averaged to obtain average conditions. The timing of the lights has been made to fit the facts. Of course, the timing for the north-south street must be co-ordinated with the east-west movements and adjustments made. Effecting this adjusted combination is, of course, the key to the success of the operation.

As shown in the diagram, all east and west cars turn on Dearborn Street, entering the Loop on one street, leaving on the next street south after passing over Dearborn Street for one block. Each line is returned to its normal street several blocks to the west. The signals are arranged to allow these movements to be made in a continuous manner, the time interval of passing along a block and loading and discharging passengers being used to allow passage of opposing traffic over the intersection just ahead.

In this way traffic moves in waves. A car or an auto passes over its route as if riding the crest of a wave. As the crest of an east-west wave passes over an intersection the north-south wave is at the valley.





A Six-Lamp Traffic Control Unit Is Placed on Each of the Four Corners of an Intersection

At the left is the top of one of the three lamp standards with the lens covers swung back to show lamp and reflectors.

The center view is a typical installation showing three of the four standards at Washington and Clark Streets, Chicago.

At the right is a close-up of the lamp standard partially disassembled to show construction of interior.

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The diagram reproduced is for State Street, one of the principal north-and-south thoroughfares. Ordinates represent intersections with east-west streets to a scale corresponding to the distance between such intersecting streets. Abscissas represent time. The heavy horizontal lines with gaps between represent the stop and permissive signals as they appear to traffic on State Street. A line represents the stop or red light, the gap a green or permissive signal. The two diagonal lines show the progress of two typical cars picked from the many checks made since the installation of the system. The diagram appears quite similar to the "string diagram" long used in schedule making. Only the co-ordinated lights are added. It is necessary to pass the cars and the traffic across the intersections in the gap or gate as it were.

MANY WAITS FOR SIGNALS ELIMINATED

From these two typical cases it is seen that the northbound car entering the Loop at Van Buren Street passed through without once having to wait for lights. A total distance of 3,204 ft. was covered in four minutes 48 seconds, or at average speed of 7.58 m.p.h. The southbound car chosen to illustrate an actual condition entered the Loop near the tail end of the green light indication, crossed Randolph on the tail end and Washington near the end of the green lights at each of those intersections. At Madison the car required twelve seconds to load and unload and just missed getting started before the red light flashed. At this point the car was delayed 28 seconds waiting for lights, and then started at the beginning of the green signal. From then on it was perfectly in step with the system and despite long loading periods at the four remaining intersections left at Van Buren well within the green light period. Even with this 28-second delay the trip of more than half a mile was made in the late afternoon at an average speed of 6.45 m.p.h. and the car waited for lights at only one of the eight intersections. This chart is a section of a large chart used by the Chicago Surface Lines in designing the timing for all car movements. The completed system was worked out with great care from the data obtained in numerous time checks. It is this application of traffic engineering data that differentiates this from the usual synchronous system.

It is seen that at State and Lake Streets 56 per cent of the cycle is used for north and south movements and 44 per cent for east-west movements. At all other intersections along State, except Jackson, 61 and 44 per cent respectively are used. If traffic conditions should demand it, these periods could be varied or the relative split at any one intersection could be changed either by cutting off the time of one movement at each end of the cycle or one end only, thus causing a "slippage" in the relative relationship. This has to be done on certain other streets having double length blocks, but it is so arranged as to give the correct timing for a steady movement along each street.

The amber light shows for three seconds during the tail end of each red or green signal period and is a warning of the coming change. Traffic may not start to cross after the amber light shows with the green. Right-hand turning movements are always made on the green light for the street out of which the turn is to be made.

When the system was planned the data indicated that a 90-second base cycle would be necessary. Practice has proved, however, that traffic movements were so facilitated that considerably shorter periods were possible, from 60 seconds when travel is light up to 80 seconds in the rush hours. Traffic checks also showed that cars turning back at Dearborn Street took a longer time to enter the Loop than to leave it. The new system has cleared up this situation, so that it takes about the same time for the outbound as the inbound trip. Such slightly changed conditions were the cause of the few minor modifications in timing and co-ordination that have been found desirable.

Cleveland Railway and Police Officials Inspect Chicago Traffic Lights

SINCE the installation of the co-ordinated traffic control lights in the Chicago Loop, many visitors and students of traffic have visited Chicago. The picture reproduced here shows Ralph W. Emerson, general manager of the Cleveland Railway, and a party of police officials from Cleveland and near-by communities.

Reading from left to right are: L. D. Bale, Ralph W. Emerson of the Cleveland Railways, Commissioner E. J. Donahue of the traffic division, city of Cleveland;

Cleveland Railway and Police Officials Inspect the New Traffic Control Signals Recently Installed at 49 Intersections in the Chicago Loop

L. G. Corlett, chief of police of East Cleveland; L. B. Miller, chief of police, Lakewood; C. E. Egeler of the National Lamp Works, General Electric Company; H. B. Cammock, traffic engineer Chicago Surface Lines; Lieutenant Flynn, Chicago traffic police department; E. J. McIlraith, staff engineer of Chicago Surface Lines.

31,000,000 Passengers Carried Without Fatality

A REMARKABLE safety record, realized by the Texas Electric Railway, Dallas, Tex., has just been announced by James P. Griffin, general passenger agent of the company. The interurban carried 31,000,000 passengers on its cars since Jan. 1, 1917, when the Texas Electric Railway began its operation, without a fatally injured passenger. The company is publishing this news in some 75 daily and weekly newspapers in that section of the country and is running a series of large advertisements this year in the *Star-Courier* to increase interurban travel, and also to help the traveling public cut down the number of casualties resulting from automobile accidents. In line with this safety campaign the electric railway is planning to build warning signs on the highways to advise motorists of dangerous curves and bridges ahead.

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Depreciation as an Operating Expense

THIRD AND FINAL ARTICLE

Determination of Size of a General Reserve Involves Many Practical Problems—Exact Theoretical Calculations Are Not of Paramount Importance if Replacement Is Used as the Basis—Changes in Company Policy Can Be Taken Care of by Proper System of Charges

By W. H. Maltbie
Late General Counsel United Railways & Electric Company of Baltimore

SOME months ago, as the result of a conversation with one of the editors of this paper, the author undertook to prepare a series of articles on the subject of depreciation. This series was looked forward to with great interest, as Mr. Maltbie was an outstanding authority on the subjects of valuation and depreciation. After his death, the manuscript was located and forwarded to this paper through the kindness of J. H. Hanna, chairman of the A.E.R.A. committee on national relations sub-committee on depreciation, of which Mr. Maltbie was a member.

These articles were written from the viewpoint of the present investigation by the Interstate Commerce Commission of the whole subject of depreciation of electric railway property. This investigation was undertaken with a view to establishing definite rules and regulations covering the allowance of charges for depreciation as an operating expense on all roads subject to its jurisdiction. Since there is a possibility that any regulations of this sort established by the I.C.C. may be accepted as a precedent by various state commissions it is important that all street railway executives should be familiar with the present situation.

These three articles, dealing respectively with causes of depreciation, methods of setting up funds to provide for depreciation and practical methods of building up a retirement reserve, constitute a valuable contribution to the literature on the subject. They were probably the last creative work of the author.—EDITOR.

WHEN dealing with a large aggregate of units in place of a single unit there arises a practical question as to the size of the aggregate reserve for the property. Confining our attention to the retirement reserve, and dealing with a single unit of property, there is no question but that the ultimate reserve must be equal to the cost minus salvage. Certain theoretical students of the subject have fallen into the error of assuming that because this is true for the individual unit of property it must be true for any aggregate of units. As a matter of fact, however, when we come to deal with a large aggregate of separate units we find the magnitude of the necessary general retirement reserve dependent on whether the business looks forward to an ultimate liquidation or to perpetual operation. For example, consider the case of a large urban transportation company, operating about 2,000 cars, which has adopted the policy of regularly retiring cars at the end of 20 years service in order to take advantage of the latest changes in the art. Naturally the business of the company grew to its present magnitude over a long term of years and its cars are therefore not all of the same age, but of all ages, and, in fact, it is now keeping up its car equipment by an annual purchase of approximately 100 cars per year. Assume an initial cost of cars, exclusive of scrap value, of $10,000 each, so that the annual allowance for depreciation on each car is $500. At the end of the twentieth year there will be 2,000 cars so purchased. Their average age will be 10½ years, their average reserve $5,250 and the total reserve $10,500,000. But under the system of the company only 100 cars are to be retired at the end of the 20th and the beginning of the 21st year, and the total amount of cash needed, therefore, is only $1,000,000. During the 21st year, with the full 2,000 cars in operation, the contribution to the reserve will be $1,000,000, and at the end of that year the retirements will again be 100 cars, utilizing only $1,000,000. In other words, under these conditions, so long as they remain static, there is a reserve of $9,500,000 for which the company has no need, unless it decides to liquidate.

On the other hand, a transportation company in an urban community will not liquidate unless the community dies or the art of transportation changes. This accumulated reserve is usually invested in the property, and therefore in the event of liquidation for either of the above reasons will, like the rest of the property, have little if any value. It is therefore argued by many students of the problem that since this excess reserve will never be needed for retirement it is not a matter in which the public is interested, and should be demanded by a regulatory body only in those cases where the investors set up a claim for it as an economic right.

THE PRACTICAL SOLUTION MORE IMPORTANT THAN THE THEORETICAL

The whole problem is one which evidently calls for a practical rather than a theoretical solution.

This practical solution must depend very largely on the financial condition of the company and on its probable future. If a company by virtue of fortunate situation, density of traffic, or other reasons, is able, with a satisfactory rate to its public, to earn a full theoretical reserve, it will accumulate in a comparatively short time a very large sum of money, for the greater part of which, if it does not look forward to liquidation, it will never have any need. It has, therefore, the opportunity of making its extensions without increasing its capitalization, and thus, whether it in-

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creases its earnings or not, strengthens its financial position.

Other properties, perhaps less favorably located, nevertheless look forward to an ultimate liquidation through expiration of franchises or the exercise of reserved rights of repurchase by the municipality, and some utilities, such as those which serve mining, quarrying or similar interests, look to ultimate liquidation as the result of the disintegration of the communities which they serve. These will all insist, and properly, upon a full theoretical reserve amounting to the full value of the investment, less junk or resale value, at the time of the anticipated cessation of their activities.

A Balancing Reserve

A third group of companies does not look to any ultimate liquidation and believes that it is wiser to make expansions and extensions by the direct introduction of capital, rather than by the investment of superfluous reserves. Companies of this group appropriate for depreciation each year a sufficient sum to take care of normal average retirement costs, and something over, so as to accumulate a small reserve sufficient to take care of any abnormal variations from year to year. As soon as this reserve reaches a moderate amount in comparison with the total value of the depreciable property, appropriations to it are decreased, so as to hold it practically constant.

The depreciation reserve of a new company is built largely during the first life cycle, and this policy enables the company to offset a lower depreciation charge against the higher operating costs that come during the initial period of an organization.

In the case of an old company without an adequate reserve, the theoretical depreciation reserve, if built, is built almost entirely during the first cycle of replacement, during which time operation must also care for the retirement of the equipment already on hand. Therefore, the adoption of the policy of building a full reserve by an old company represents a burden imposed almost entirely upon the users during the first cycle of replacement.

In either an old or a new company, therefore, the adoption of the plan of accumulating a moderate reserve to serve as a balancing fund for variation in annual retirement cost operates to the benefit of the present generation and imposes no burden upon the future generation, the only danger being to the investor in the event of an ultimate liquidation.

The Practical Reserve Simplifies the Sinking Fund Method

The adoption of this practical form of reserve, providing only for the equalization of retirement costs and eliminating provision for ultimate liquidation, also removes the accounting difficulties which have made some companies unwilling to consider the sinking fund method of handling the reserve. If we assume a full theoretical reserve set up separately for each unit of equipment, with proper allowances for additions or changes, the accounting difficulties of the sinking fund method are numerous. Consider, for example, the purchase of a car having a depreciable value of $10,000 and an estimated 20-year life. If the reserve is to be set up on the straight line basis, there is nothing more than a single charge of $500 per year. If, however, it is set up on a sinking fund basis, an estimate must be made as to the probable earnings of the contributions to the fund and then a special depreciation charge worked out which, with its earnings, will yield $10,000 at the end of the 20-year period. If at any time during the life of the car it is remodeled or has additional equipment or accessories added, the rate must be changed. If it is desired to set up a system of this kind for 50 cars the present age of each car must be determined, and the rate will vary with every difference of age of the cars already owned. The accounting system in such a case is admittedly complex and the advantages probably do not justify it.

If, however, we are dealing with depreciation from the other point of view, are appropriating annually to depreciation the average retirement cost and are carrying in addition a certain balancing fund with which to take care of abnormal requirements, the sinking fund method merely requires that any income from the reserve shall be added to the balance of the fund. This strengthens the balancing fund and at the same time leaves operating income undisturbed by the introduction or addition of an investment return.

An excellent illustration of this method is the system approved by the District of Columbia Public Utilities Commission for certain of the utilities under its jurisdiction. The reserve is subject to the commission's supervision. It is not invested in the business, but the utility is authorized, with the permission of the commission, to borrow on the company's own notes such portions of it as may be needed, paying into the fund annually an agreed interest rate for the portion of the money borrowed. In this way the plant owned by the company always represents investment, and the company's indebtedness to the depreciation fund belongs in the same class with its short-term notes. The system apparently has much to commend it.

The Practical Method and the Replacement Reserve

If a company has adopted this practical plan of accumulating merely a balancing fund in place of a full theoretical reserve there is, of course, no effort to allocate the reserve to individual units of property or to make the amount in the reserve for the property as a whole equal to the difference between original cost less salvage and unexpired life value. It is therefore possible for such a company to adopt the plan of providing through its depreciation charges a replacement reserve rather than a retirement reserve without meeting the difficulties above mentioned as confronting the owner of a single unit.

If a company which has adopted the policy of building a replacement reserve is confronted with a change in replacement costs due to a change in the purchasing power of the dollar, a corresponding change in the charge of transportation will automatically adjust the annual contribution for depreciation so as to take care of the current replacements and make a contribution proportionately increased or decreased to the balancing reserve. In other words, if the purchasing power of the dollar is changing, the replacement reserve will call for a corresponding change in the cost of transportation, while the retirement reserve will cause the cost of transportation to lag behind the general price trend. Thus, on an ascending scale of prices the strict retirement reserve holds the cost of transportation down and on a descending scale of prices holds the cost of transportation up, while the replacement reserve keeps it in line with the general trend.

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There is also a distinct economic advantage in the adoption of the replacement reserve. Under the retirement reserve the change in the cost of an article which is to be replaced in kind is a matter for the investors and not for the patrons. On an ascending scale of prices this means that additional money must be put into the property without in any way increasing its productive capacity. Thus, a street railway system which finds it necessary at the present time to rebuild 20 miles of pre-war track in paved city streets must, if it limits itself to the retirement reserve theory, invest not far from a million dollars of new money which does not in any way increase the system's productive capacity. Financing of this sort is difficult and, if the amount of it is large, may easily lead to an increased cost of money or an impairment of credit, both of which react not only to the injury of the investor but to the injury of the general community.

On the other hand, if the price scale is descending, the retirement reserve forces the public to contribute more money than is necessary to maintain the plant and therefore provides either for a partial liquidation of the investment by an actual distribution to the investors or for an expansion of the plant without increase of capitalization.

Reserves Under Investment and Reproduction Theories for Rate Base

Any attempt at the theoretical solution of the problem of the choice between the retirement and the replacement reserve proves, however, to be inextricably tangled up with the question as to whether the rate base is to be actual investment or reproduction cost.

Consider, for example, the case of a company which in the pre-war period was operating 1,000 cars of 20 years life, and an initial investment, less salvage, of $5,000 per car. Assume, further, that the company had been in operation long enough to equalize its renewals so that it was maintaining its equipment by an annual replacement of 50 cars per year, and that the economic changes due to the war raised replacement costs, less salvage, to $10,000 per car.

In the pre-war period the annual charge for depreciation was $250,000 per year, and the demand for it was justified by the fact that the investor was entitled not only to earn upon his investment but to have it maintained intact, so that the $250,000 paid under the name of depreciation was merely a payment by the public for consumption during that year of the one-twentieth portion of the useful life of all cars. In addition, if we assume an 8 per cent return, the public must pay a return of $400,000 or a total payment of $650,000.

Now that the change in price has taken place, under a strict application of the investment theory of the rate base, the public would pay during the first year after the change a fair return (say 8 per cent) and a depreciation allowance of 5 per cent (a total of 13 per cent) upon 950 old cars at $5,000 each and on 50 new cars at $10,000, a total of $682,500, or $32,500 more than its total payment in the previous year. During the second year after the change the contribution will be on 900 old cars and 100 new, a total of $715,000, or a further increase of $32,500, the additional money necessary to purchase the new cars having been furnished by the investors. If the new price is permanent the annual contribution by the public for return and depreciation will increase by $32,500 annually, and at the end of the first life cycle of 20 years the total payment by the public will be $6,825,000 in excess of the amount it would have paid had the pre-war prices continued. Under the reproduction cost theory of the rate base the public must pay each year after the increase in price the full return upon the reproduction cost of all the property, or, in our illustration, 8 per cent on $10,000,000, or $800,000. If the public is also to pay under the name of depreciation the current value of the one-twentieth of the car value consumed, this amounts to $500,000 additional, or a total payment of $1,300,000.

As frequently happens, a compromise method may be devised which does not fit either extreme theory, and yet offers certain practical advantages.

Let us assume that the public is willing to free the company from the necessity of procuring the additional capital and meets the full cost of replacement, paying a return only on money furnished by the investor. The public then pays for return $400,000, and for replacement $500,000, a total of $900,000, or $250,000 per year more than before the price change. In the first life cycle this amounts to $5,000,000, or a saving, as compared with the first method, in this 20-year period, of $1,825,000, and thereafter a saving of $400,000 per year as long as the high price continues.

In general, the annual payment under the compromise method becomes less after $\frac{1}{R + D}$ years after the increase in price, when R and D are the rates of return and depreciation, and the total payment becomes less after $\frac{2}{R + D} - 1$ years. This latter period is lengthened if R is less than $D \frac{(1 - D)}{(1 + D)}$ since the annual increase under the first method ceases at the end of the first life cycle.

In the long run, therefore, this compromise adjustment will be beneficial to the public if the increase in price continues for a sufficient length of time. If prices are decreasing, conditions are, of course, reversed; the public gains temporarily and loses in the long run, the ultimate advantage with fluctuating prices depending, therefore, upon whether the general trend is to be upward or downward.

Attitude of the Depreciation Section of the Interstate Commerce Commission

The present attitude of the depreciation section of the Interstate Commerce Commission may be inferred from its recommendations in the case of the steam roads. These, as noted above,* recommend that no depreciation reserve be set up for track; that a unit reserve be set up on the straight line method for all units of equipment, and for all other units with a cost of over $1,000 which can be satisfactorily individualized, and that group reserves be set up for certain other classes of property which cannot be individualized. They also provide that the commission shall establish definite rates of depreciation, based upon an average life, including obsolescence, inadequacy and other elements, as well as wear. They do not, however, contemplate a single set of depreciation rates for the entire country, but rather the breaking up of the carriers into as many groups as may be necessary, and the determination of rates for each group. They also make provision for modification of the rates in the case of any carrier who finds them, after trial, unsatisfactory.

*See the first article in the ELECTRIC RAILWAY JOURNAL for Feb. 27, 1926.

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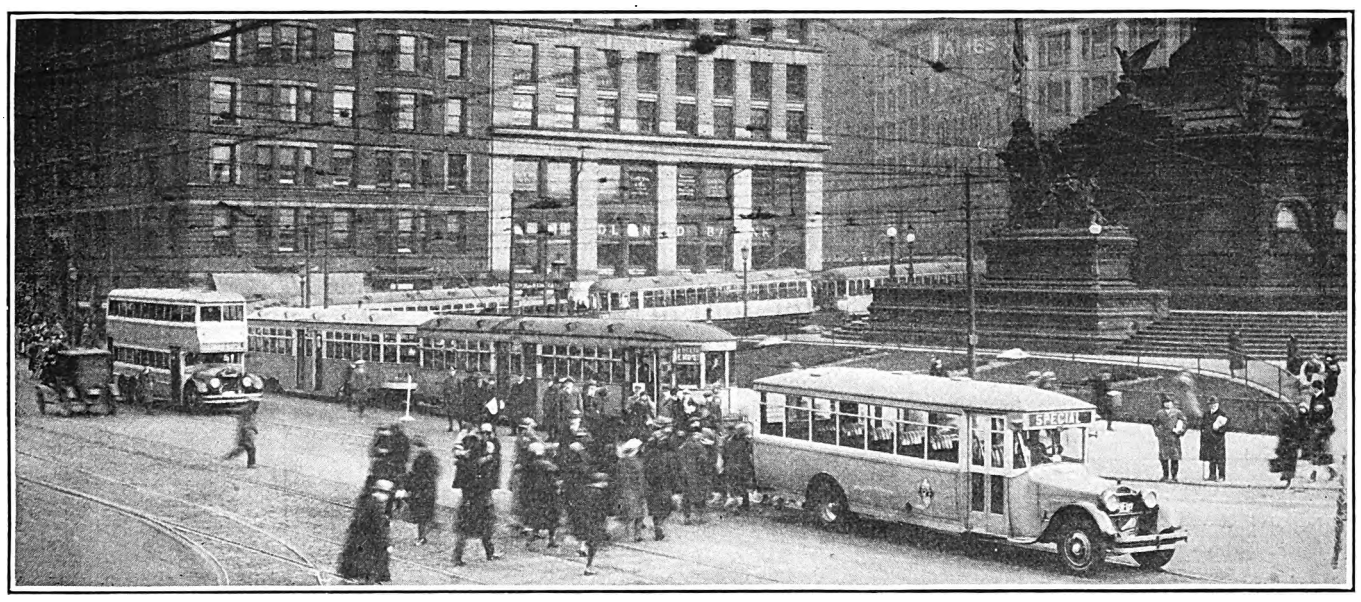
Cleveland Sees in Buses an Opportunity for Extended Service

More than 100 Buses Will Have Been Placed in Service in a Little More than Six Months Time Upon Completion of Present Shipments—Early Routes Were in Crosstown or Feeder Service and More Recent Ones in Through Service, Using Double-Deck Buses—Other Routes Contemplated



Cleveland's Famous Public Square and the Modernized Common Carriers Used Today by the Cleveland Railway
Both single-car trains and motor and trailer trains, a new Six-Wheel double-deck coach and one of the White model 50-A coaches can be seen in the foreground amid a typical noonday traffic movement about the square

SINCE Aug. 17, 1925, the Cleveland Railway has built up a notable bus operation co-ordinated with its rail system. Of the eight bus lines already started three are in feeder or extension service, three are crosstown connecting lines, one, the downtown loop line, the first to be started and the only one yet discontinued. Of greatest importance is the Carnegie-Clifton main line route, requiring 30 double-deck buses.

This latter route, 10.24 miles in length, extends from the East Boulevard (the eastern city limits) along Carnegie, Prospect and Euclid Avenues, through the business center and the Public Square over the high level bridge, Franklin Avenue and Clifton Boulevard to the western city limits at West 117th Street, adjoining the city of Lakewood. For the entire distance it parallels car lines and is a purely supplemental service.

Ten cents is charged on all buses, except certain extensions in the suburbs, and free transfers are given to existing rail cars and buses at intersecting points. The present fare on the cars is 6 cents and 1 cent for a transfer. Hence a passenger originating on a car can board a bus with a transfer and pay 3 cents additional, putting him on the same basis as if he began his ride on a bus.

On the Carnegie-Clifton line double-deck Safeway coaches, manufactured by the Six-Wheel Company, are used. Thirty of these are in service and ten more are on order. Full eighteen-hour schedules are provided, giving a 7½-minute base headway and a five-minute headway during the rush hours. Except for one single-deck Six-Wheel coach all the others are Model 50-A of White Motor Company manufacture with Kuhlman bodies. The double-deck buses are fully inclosed on both decks, including the rear entrance and stairs to the upper deck. The bodies were manufactured by the American Body Corporation.

ROUTE AND SCHEDULE DATA OF CLEVELAND RAILWAY'S COACH OPERATION

Main Line Route	Length One Way Miles	No. of Coaches in Service	Seating Capacity	Headway, Schedule Speed M.P.H., Minutes Excluding Layover Base	Rush	Base	Rush	Type of Coach
Carnegie-Clifton	10.24	30	62	7½	5	12.8	11.8	Six-Wheel double-deck
Crosstown Service								
Lee Road-East 113th Street	9.45	10	29	15	8	14.1	12.3	White Model 50 A
Nottingham	7.90	12	29	15	8	13.6	11.8	White Model 50 A
Feeder or Extension Service								
Rocky River	2.20	3	29	15	15	13.2	13.2	White Model 50 A
Warrensville	5.50	2	29	60	30	13.2	13.2	White Model 50 A
Mayfield Road. (since extended)	1.74	1	29	20	20	13.1	13.1	Six-Wheel single-deck
Totals (for lines running in January, 1926)	37.03	58	..	..	..	....	....	31 Six-Wheel—27 White
Extension of Mayfield Road	2.64	6	29	15	8	....	....	White Model 50 A
Bennington (March 8)	3.17	4	29	15	8	....	....	White Model 50 A
Proposed for Immediate Future								
Memphis (immediate future)	3.26	4	29	15	8	....	....	White Model 50 A

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Two men are used. The driver operates an exit door by manual control from his seat and the collector operates the rear door from his normal position in the rear vestibule. Fares on the lower deck are collected after the passengers are seated, in the intervals between stops. The upper-deck passengers pay upon leaving, thus avoiding the necessity of the conductor working on the upper deck at any time. The Rooke register is used for the 10-cent fares and the 3-cent additional fares paid by street car transfer passengers are collected by hand.

Route data for all bus lines are given in an accompanying table and the location of routes is shown on the map. The downtown loop line connecting railway stations, hotels and other important points was apparently demanded and service was started on Aug. 7. This operation proved unsatisfactory, being in the congested district all the time, and the results proved it to be a losing venture. It was discontinued by common consent of city and company on Jan. 30.

The double-deck route has been described above. The eastern half of this line to the Public Square was started Nov. 7 and the full route to the western city limits one month later, Dec. 7.

The Lee Road-East 113th Street route is in the eastern section, extending from East 123d Street and Superior through East Cleveland, Cleveland Heights, Shaker Heights on Lee Road to Woodland, on Woodland to East 130th Street, on 130th and 131st Streets to Alvin Avenue in Garfield Heights. Most of this line lies just outside the easterly city limits and provides crosstown service to eight car lines. This service was started Oct. 6.

The Nottingham route starts on Lake Boulevard, continues northeast to East 185th Street, to Waterloo Road, to East 152d Street, to Darwin, to East 140th Street, Aspinwall Avenue, Saranac Road, East 152d Street, Ivanhoe Road to the Nela Park Lamp Works of the General Electric Company. This line will run directly through on East 152d Street upon the completion of a bridge now under construction. Service was commenced Sept. 11.

The Rocky River feeder line extends from the end of Lorain Avenue line for 2.2 miles out Riverside Drive. It was started Sept. 6.

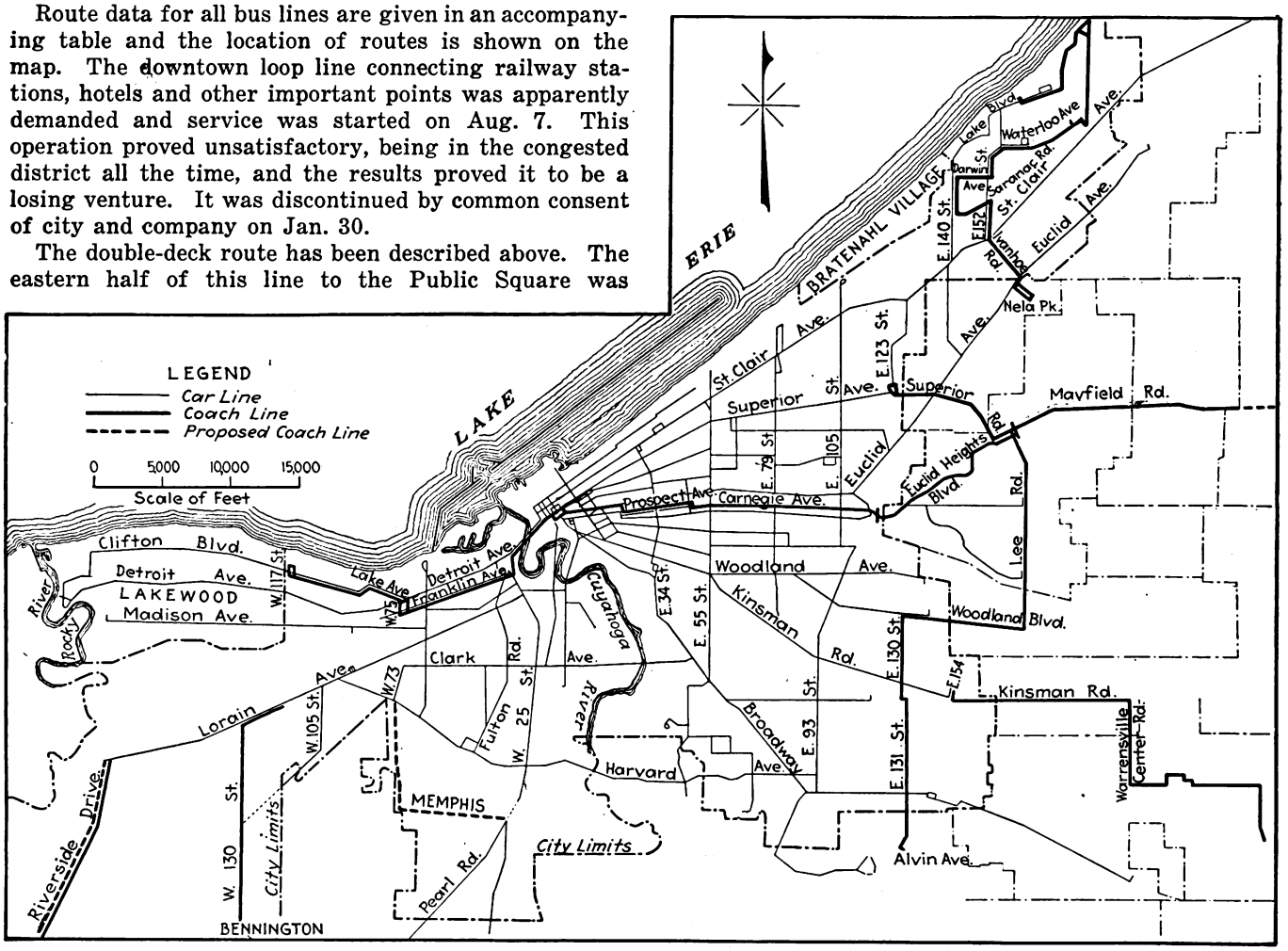
The Warrensville line acts as an extension to the Kinsman Road car line, beginning at East 154th Street and extending out Kinsman Road to and on Warrensville Center Road to the three Warrensville institutions. Service started Sept. 23.

The Mayfield Road route begins at the outer extremity of the Euclid Heights car line at Lee Road and extends easterly on Mayfield Road to Green Road, 2.64 miles in length. A 5-cent fare is charged with no transfers. Service commenced Nov. 25.

Also on March 8 an extension line was started beginning at West 117th Street and Lorain Avenue, running west on Lorain Avenue to 130th Street, thence to Bennington, as shown on the map.

As this paper goes to press, one other line is contemplated. This new route just starting is in crosstown service from Dennison Avenue and West 73d Street, skirting the city limits and terminating on Pearl Road. This line is 3.26 miles long. A base headway of fifteen minutes with eight-minute rush service is planned for this line.

It is thus seen that some considerable part of the service offered by the Cleveland Railway coaches is naturally of an unprofitable type. Of the three feeder lines, excluding those started since Feb. 1, comprising 9.44 miles of route, there were operated in January of this year 24,684 bus-miles at a gross revenue equivalent to 12.6 cents per bus-mile.



Present Coach Routes of the Cleveland Railway Have Been Laid Out to Supplement Rail Service. Several Additional Routes Are Under Consideration

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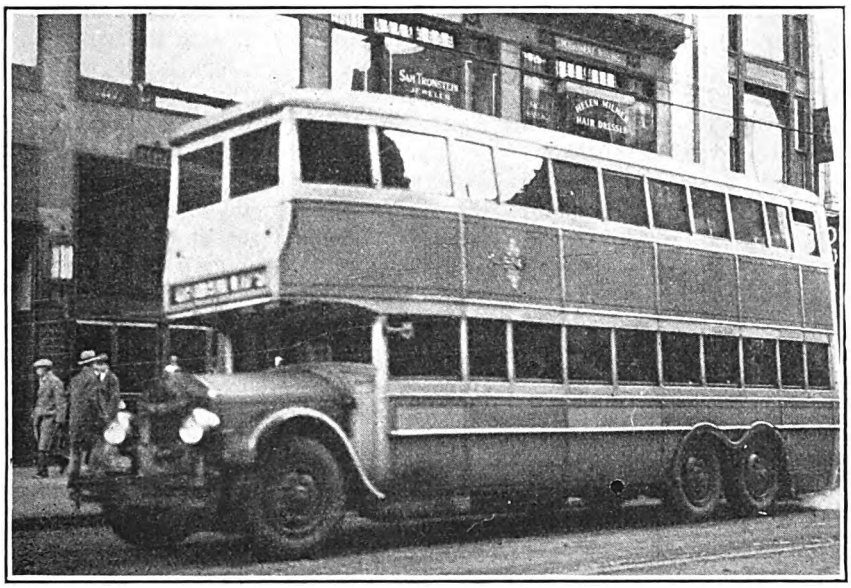


Both Decks as Well as the Rear Vestibule of the Double-Deck Bus Recently Adopted by the Cleveland Railway Are Totally Inclosed. Passengers Enter at the Rear and May Leave by the Front or the Rear

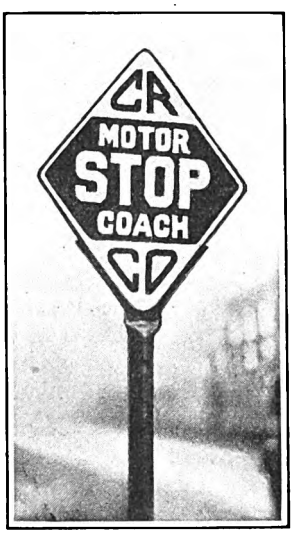
In crosstown service, comprising two lines, or 17.35 miles of route in operation during January of this year, there was operated 91,558 miles at 25.9 cents per mile.

On the double-deck main line, having a route mileage of only 10.24, there was operated during January 104,344 miles at an average of 44.24 cents per vehicle-mile.

For 30 days of January the loop line ran off 14,172 miles at an average gross of 14.71 cents per mile before final discontinuance.

The feeder service is seen to pay the least, the crosstown service somewhat better, and the main line with double-deck two-man buses the highest. Better results are anticipated by the management after the service has been established for a longer period.

For the entire month of January the operating statement set up on the A. E. R. A. method of accounting is as follows:

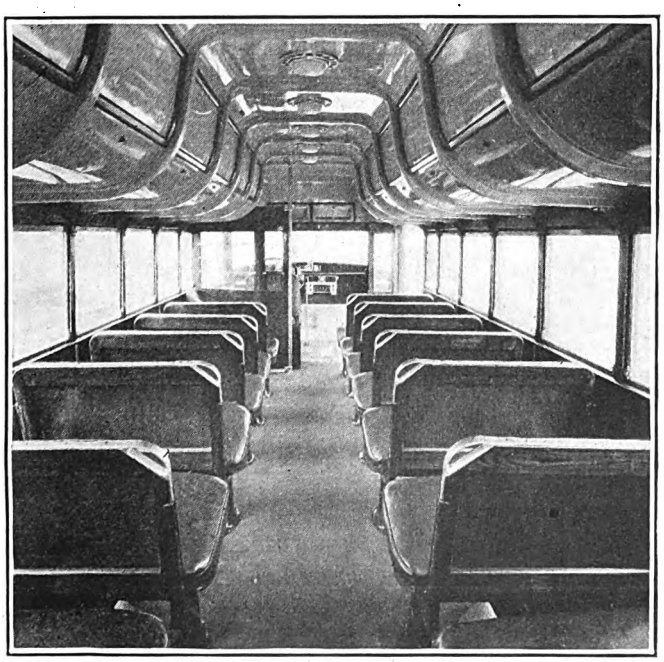


Green and White Enamel Signs Indicate Stopping Points

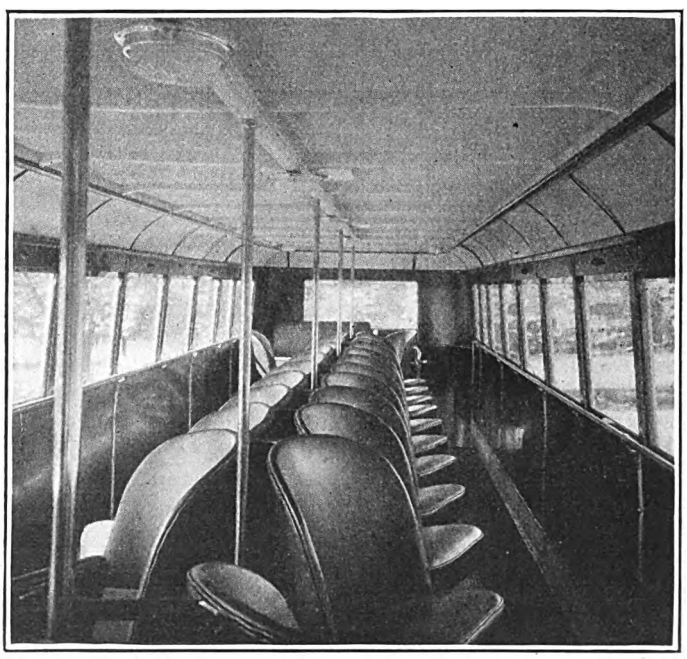
Gross revenue—January, 1926	$75,076
Operating expenses, including depreciation	71,284
Gross revenue less operating expense	3,792
Taxes and interest	3,755
Surplus	$37

Note—Depreciation was calculated on basis of 300,000-mile life of coaches and 10 per cent of original cost as salvage.

It is observed that the operations so far are just breaking even. As business develops and with the curtailment of the loop line, future months are calculated to show a somewhat greater surplus. At best, January was estimated by the management as a lean month to use as a basis for comparison, but changes and additions have been made so rapidly that it is difficult as yet to pick a representative period.



The Lower Deck Looking Forward. Seats Are of Spring Construction Upholstered in Genuine Leather



Looking Toward the Rear from the Front of the Upper Deck of New Six-Wheel Coaches Used by Cleveland Railway

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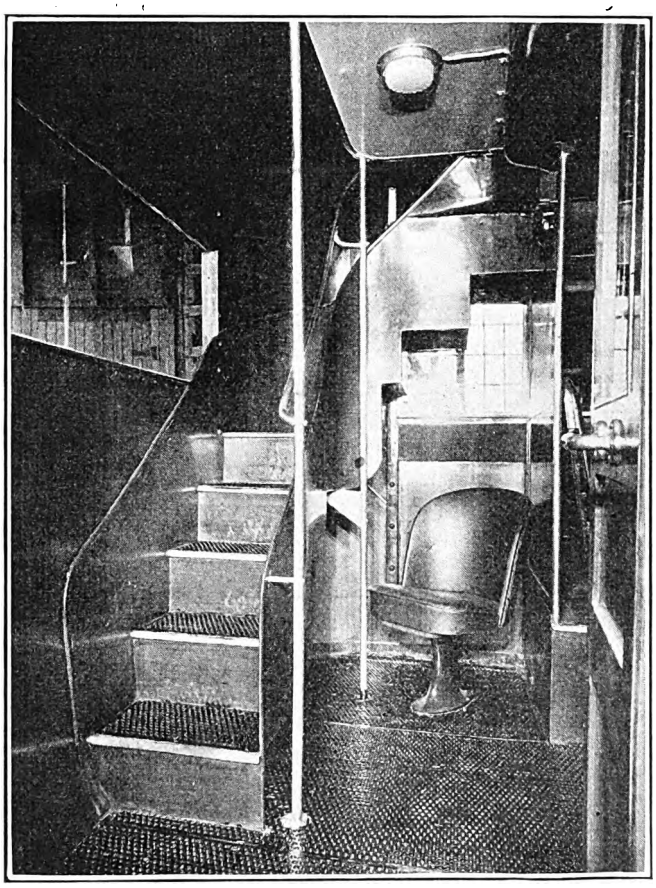


Rear Vestibule and Stairs to the Upper Deck. The Seat Is for the Conductor's Use

The Cedar garage, located at East 107th Street and Cedar Avenue, near the end of the east side of the double-deck line, has an area of 20,000 sq.ft. and a capacity of 42 coaches. Near the downtown business district at 24th Street is located the Central garage, having an area of 12,000 sq.ft. and a capacity of 22 coaches. Eventually this garage will be the central bus repair shop for the system, after completion of the garage at Berea Road. At Berea Road and 104th Street a building is now being remodeled and will be equipped to serve 70 coaches. This building has an area of 33,000 sq.ft. All garage space at present is on a yearly rental basis.

The present service and maintenance schedule is to wash, gas and replenish crankcase oil every night. All parts are oiled or greased every week. Buses are inspected every 2,000 miles and every 16,000 miles this inspection includes an internal examination of the motors. It is planned to make a general overhauling every 50,000 miles.

While depreciation is based on an outside life of 300,000 miles, it is the thought of the management that this mileage will be exceeded if proper care is taken of the equipment during its early life.

Another feature to be considered in comparing the operating costs given above with other operations is that the Cleveland Railway has for seven years been unable to finance from new money derived from the sale of common stock, which, under the Tayler grant, must be sold at not less than par. The rate of earnings, also fixed at 6 per cent, has kept the market price of such securities below par, thus effectively shutting off new money from the natural source contemplated by Judge Tayler.

Capital that has been used for the purchase of buses and for other purposes in connection with the expansion of the property in recent years has been obtained through certain allowances, for which provision was made, and the writing off of certain elements of capital as obsolete. Thus earnings could be diverted to new equipment to the extent of such writing off instead of to the balance account, which would ultimately be reflected in lower fares. For this reason much expense that might be properly capitalized finds its way into the operating accounts. Such a condition redounds to the benefit of the stockholder, but throws unjustified aspersions on the management for its ability to operate economically.

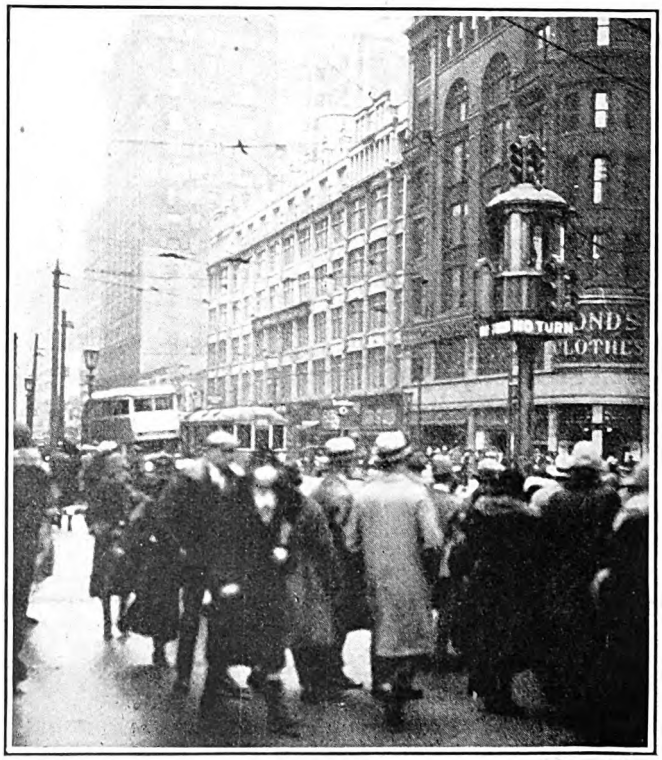
Due to this difficulty of raising new money, only actual cost of buses and major expenditures for garage equipment purchased for their maintenance are capitalized. Under this plan the present capital assets for bus operation are as follows:

30 Six-Wheel double-deck coaches 1 Six-Wheel single-deck coach 30 White single-deck coaches 4 Tire and service trucks (¾-ton White) 1 Large service truck (2½-ton White)	$603,251
Garage equipment, gas pumps, air compressor, grinders, greasers and tools	7,496
Bins, furniture, etc.	2,500
	$613,247

About $15,000 worth of stores on hand are charged to maintenance as used.

In addition the buses now on order, consisting of ten Six-Wheel double-deckers and 30 single-deck White coaches, will bring the capitalization up to well over $1,000,000.

Natty uniforms for coach operators of gray whipcord add materially to the excellent and courteous treatment the coach passenger receives. Coach stop signs, as shown in one of the views, are also placed at all stopping places to aid the prospective passenger. The signs are enameled in green and white.



A Double-Deck Six-Wheeler on Euclid Avenue, Cleveland, About to Pass the New Synchronized Traffic Control Tower at East Ninth Street

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Advertising Car Does Missionary Work at Muskegon

By L. E. Blue
Engineer Muskegon Traction & Lighting Company

IN AN effort to impress upon the citizens of Muskegon a better understanding of the conditions pertaining to the transportation situation in the community the Muskegon Traction & Lighting Company recently prepared an advertising car with appropriate slogans painted on it. The idea is similar to that which has been used in other places, but the purpose is slightly different. Bus competition has been very severe in spite of an attempt which was made four years ago to eliminate it. A popular vote was taken at that time and the people declared themselves in favor of the street railway by a large majority. Then the city stopped the operation of two of the competing bus lines, but three others which were only partially competitive have been allowed to continue.

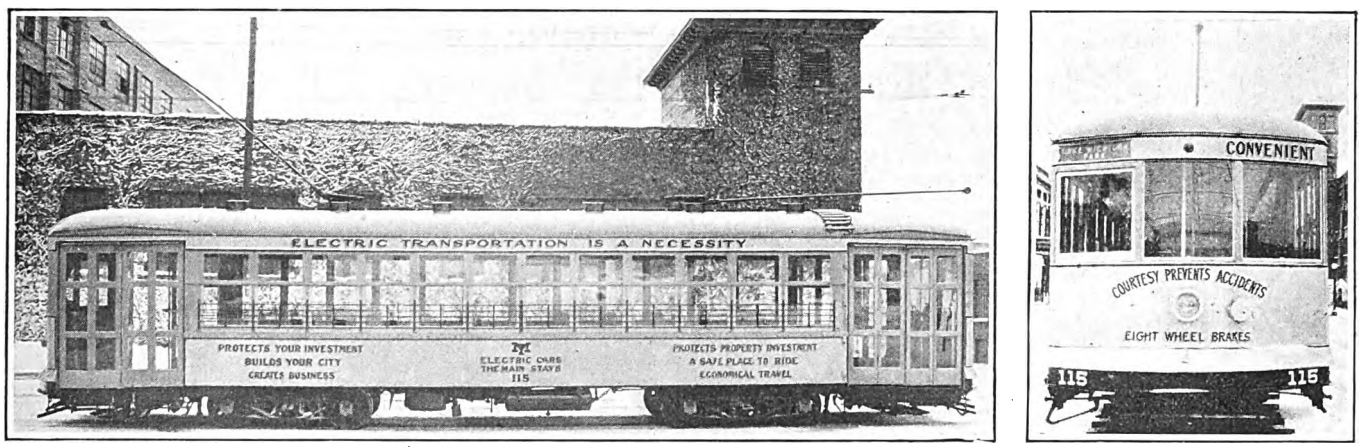
If the railway could have the business which is now going to the bus lines it would be in a position to turn a loss into a slight profit. Operation cannot be continued indefinitely under the present conditions. Therefore, the company is attempting to arouse some public consideration of the matter by the advertising car and such slogans as:

"Relieves Traffic Congestion."
"Electric Cars the Mainstays."
"Protects Property Investment."
"Builds Your City."
"Street Cars Do Not Skid."
"A Shopping Convenience."
"A Safe Place to Ride."
"Ride the Trolley Cars and Save the Difference."
"The Modern Electric Way."
"Electric Transportation is a Necessity."

In regard to the latter slogan the question may be raised, "Is electric railway transportation a necessity in a community the size of Muskegon, with a population of 50,000?" It may develop that buses are what the people want and will entirely supplant the street railway service. This remains to be seen. In the meantime it is the belief that electric cars are the mainstays or the backbone of the transportation system and buses should be used only as feeders to the railway or in developing new territory.

The car which was used for the advertising is a large double-truck, safety, one-man car of the latest type built by the St. Louis Car Company. Since this car was to be the company's salesman or missionary, only the best that was available could be considered for the purpose. A few modern cars are being operated and this type is in accordance with the kind of equipment and class of transportation the company hopes to be able to provide. Improved service, however, will only be possible through increased patronage of the street railway lines.

In contrast with the usual yellow and orange colors of the other cars, the advertising car was painted a fawn gray trimmed in orinoco blue and vermilion. The lettering is in black shaded with blue and is easily read at considerable distance. In general the car is attractive in appearance and it is planned to paint all the cars with the same color scheme. The interior of the car was cleaned and revarnished so as to be in keeping with the external appearance. The car operators were requested to have their uniforms pressed and to appear for work clean and neat in appearance. This was a detail which was considered to be consistent with the rest of the program.



Latest Type Light-Weight Double-Truck Car Was Used by the Muskegon Traction & Lighting Company to Carry Its Message to the Public

The advertising car has been operated on the streets since Jan. 26, and so far has aroused favorable comment from the city officials, individuals and the local newspapers. It will be run for several months.

Views of Salt Lake Manager Aired Before Engineering Council

THAT traffic problems are by no means confined to certain portions of the country was emphasized at a recent meeting of the Engineering Council of Utah held in the Hotel Utah, Salt Lake City. The question was gone into thoroughly from various angles. Both city and highway traffic were considered, and the findings of the meeting were compiled and forwarded to Washington, where they will be used by both the American Engineering Society and the Hoover conference in nation-wide studies of the subject.

Various state and local regulations to do away with or at least alleviate the frightful accident toll of traffic accidents were discussed. E. A. West, manager of the Utah Light & Traction Company, was an active participant in the proceedings. He took for the keynote of his address "Streets for Traffic and Not Garage Purposes." Mr. West told why he believed the problem could be alleviated by prohibiting parking on the main downtown streets altogether.

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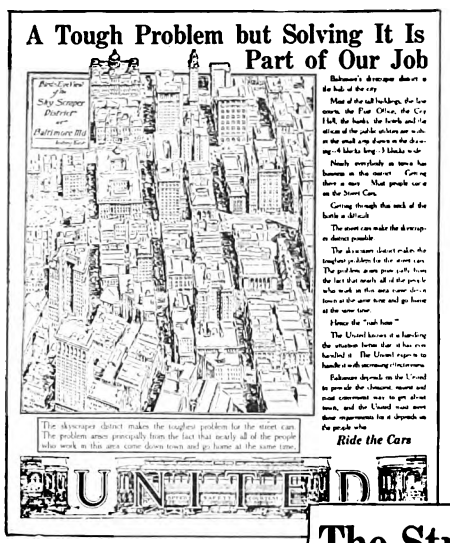
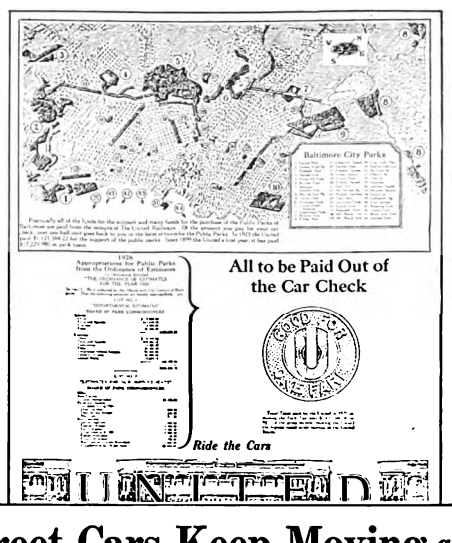
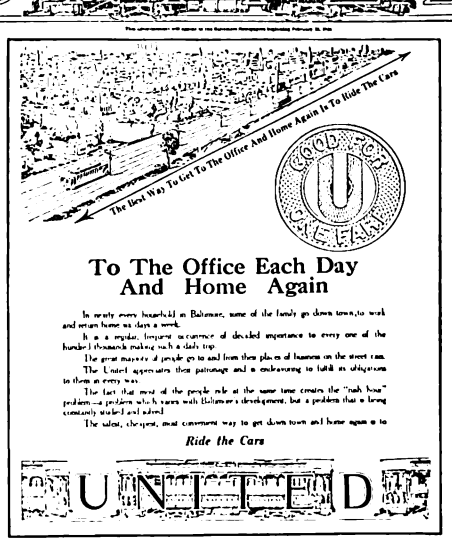
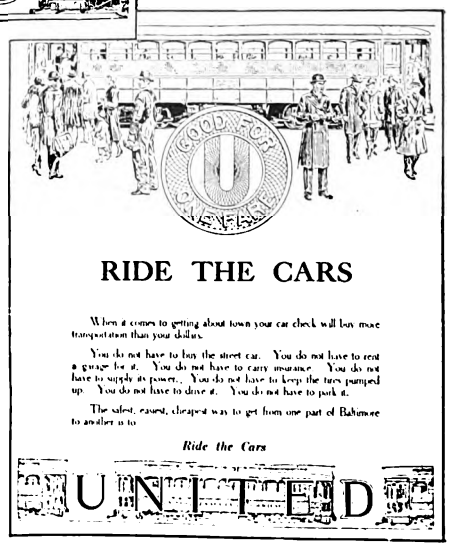




Unprecedented Newspaper Space Used at Baltimore to Sell Rides. The New Campaign Attacks the Subject with Vigor, Determination and, Best of All, Logic

Readiness to Serve Is the Big Idea Behind the Baltimore Campaign, Best Instanced, Perhaps, by These Recent Examples of Newspaper Display. Note the Familiar "Ride the Cars"





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Nothing to Sell but Service

Unprecedented Newspaper Advertising Campaign Being Carried On by United Railways & Electric Company of Baltimore as a Means of Selling Rides—Nothing Profound—A Straight Sales Plea

ADVERTISING which strikes a new note in traction publicity is being conducted by the United Railways & Electric Company, Baltimore, Md., as part of a persistent effort to stimulate patronage by the general public. The campaign is still young, but already it has attracted attention among railway officials in other cities. Letters of inquiry to the railway and requests for specimens of the material published in the local papers testify to this.

A novelty of the advertising is that it treats the car ride as an article of merchandise, to be sold by the methods that have created markets for cameras, cleansers, clothing and cod liver oil. In this respect, and in the amount of space occupied, the announcements constitute a departure from traditional advertising methods followed by most other utility companies. Neither text nor design suggests practices with which the reading public is familiar.

With merchandising as its central theme, the company is proceeding on the well-considered theory that it has something to sell and that intelligent effort will create outlets not otherwise available. The theory shows total disregard of the time-honored belief that the car ride is not a commodity in the sense of other forms of merchandise. In blazing the new trail the Baltimore system reveals a conviction that the 7½-cent car check is something for which the public has greater need than it realizes, and that the people can be stimulated to the purchase and use of the metal tokens in increasing quantities.

There is something impressive to the habitual car rider in the sight of an established railway discarding old ideas and supplanting them with evidence of an ultra-modern belief that advertising will produce a greater number of coins in the conductor's fare box. True, the company has advertised before, but for the most part the Baltimore company had restricted its stimulative efforts to the spending of small sums devoted almost entirely to the exploitation of Bay Shore Park, an amusement enterprise owned by the corporation. The advertising displays which have appeared previously in the Baltimore papers have been small and perfunctory as to character and treatment. Attempts to change the car-riding habits of the community as a whole have played no part in the publicity. Until now there has been no indication that such attempt has been even considered. The space used is a full page once a week in each of the five daily newspapers of Baltimore, the *Sun*, the *Evening Sun*, the *American*, the *Evening News* and the *Daily Post*.

For its dominant note the advertising copy takes the car ride as an article of merchandise, with skillful presentation of the "selling points" with which the commodity is endowed. Propaganda and pleas for public sympathy are conspicuous for their absence. The advertisements offer no profound essays on the economics of urban transportation. There is no facsimile of the presidential signature. Personalities are submerged as effectively as arguments in favor of higher car fare. The one text is that the company has something to sell, and that there are many reasons suggesting that the people should buy it in greater quantities—for their own convenience and economy.

Throughout the entire series, as so far published, the advertising matter emphasizes the convenience and economy to the public. The treatment of these points is typified by one of the displays dealing with the daily trip to business, as made by a large percentage of the city's population. This advertisement has the obvious purpose of showing the advantage of the city trolley as compared with the automobile.

Persistent attention to the automobile is manifest in various individual advertisements. In offering its selling arguments the company lays stress on the relative place of street cars and motor vehicles in the congested portions of the city. This point is presented with striking force in a large illustration, reproduced from a photograph depicting conditions in the heart of the shopping district.

Readiness to serve is the basis of another display. This advertisement carries a top row of line drawings illustrating the company's 1,357 cars, 5,125 employees, 433 miles of tracks and trolley, its consumption of electric current and its annual tax payment. These are not made the excuse for an appeal to public sympathy, as constituting a burden of operation, but are cited as indicating what the people of Baltimore have at their command. "All these and a transfer for your car check" is the offering of this advertisement.

The entire series lays stress on the convenience and money-saving possibilities of street car rides. The keynote of the merchandising campaign is found in the persistent repetition of the simple phrase "Ride the Cars." This phrase appears at the bottom of each advertisement in the place usually occupied by the dashing signature of the railway president. The fact that the terse injunction to patronize the system occupies this particular place of honor may be taken as typifying the whole spirit of the campaign and stamping it as one of merchandising instead of propaganda.

The explanation of the series was not long in reaching popular comprehension. The entire spirit of the advertising made it manifest that the United was not seeking something as a matter of course, but that its search was definitely aimed at increased patronage—that the company was buying advertising space because it was a merchant with something to sell. The present comment is wholly favorable.

In replying to letters of inquiry from other electric railways, the officials of the United have expressed themselves as enthusiastic over the public reception of the new line of advertising.

The campaign was started on Jan. 28. It will continue for an indefinite period.

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Association News & Discussions

Illinois Association Celebrates Silver Anniversary

Railway Leaders Take Optimistic View of Future—Basic Conditions Held to Be Improving—Public Relations Occupies Important Place on Program

NEARLY one thousand utility men, members of the Illinois Electric, Gas and Electric Railway Associations participated on March 17 and 18 in the combined annual meeting of the three organizations, which this year marked the 25th anniversary of the Illinois Electric Association. Particularly fitting to this occasion was the selection of Springfield, Ill., last resting place of the great emancipator, Abraham Lincoln, as the place for the meeting.

Public relations occupied a foremost place on the program and in the discussions. Since this subject is of equal importance to all branches of the utility business, combined morning sessions of the three associations were devoted to various phases of public relations work. The work of the Illinois Committee on Public Utility Information occupied the entire morning session on the second day.

In his opening address J. P. Clayton, president of the electric association, said that there is evidence of increasingly cordial relations between the various public utilities in the state, their customers and the general public. He maintained that permanently successful public utility service cannot be rendered except in the presence of such relations between the companies, their customers, the general public and the public authorities. He called attention to the success with which employees and the public have been enrolled as stockholders through the sale of preferred stocks. This, he cautioned, places on utility managements the heavy responsibility of maintaining a safe margin of value junior to the publicly held securities to safeguard the prompt payment of preferred stock dividends. Mr. Clayton pointed to the success which has accompanied the effort by the electric railways of the state to meet their many problems as evidence of the rapid improvement which may be expected in the immediate future.

MUCH WORK TO BE DONE

That there is still room for much improvement in the work being done by utilities to better their relations with the public they serve was the opinion expressed by J. E. Davidson, president National Electric Light Association. "Most public relations work," he said, "is conducted without a definite plan. There is a tendency to become impatient if results are not obtained almost immediately." Mr. Davidson took the occasion to comment particularly on the electric railway situation. He expressed great confidence in their future, and pointed out that some of the very factors that produced difficulty in the past are today putting riders back on the cars. In his opinion, growing street congestion, fear of accidents and parking problems are all tending to encourage use of electric railway service.

"Railway men today have a rare opportunity," he declared. "They are the chauffeurs of the American public. They offer a combination of the safest and most economical transportation on the streets." He added the suggestion that electric railway operators should endeavor to duplicate in their service the best features of an automobile ride. This, he said, should include a strenuous attempt to humanize the service and to beat the automobile on its own ground of comfort and attractiveness. One of the healthiest factors in the present railway situation, according to Mr. Davidson, is that politicians have lost the support of the public in attacks on electric railway properties. He said that it only remains for railway managements to take advantage of this condition by bending every effort toward the improvement of service and the dissemination to the public of facts regarding local transportation. Such a program, he held, will completely destroy the popularity of utility baiting as a political sport.

OPTIMISM FEATURES RAILWAY DISCUSSION

Papers and discussion dealing specifically with the railway situation developed a decided spirit of optimism regarding the immediate future. The high spot of this program was an address by Lucius S. Storrs in which he called on railway men to concentrate their efforts on the future and outlined five major subjects that are of paramount importance to the industry at this time. These include complete cooperation of all forms of local transportation under one management in each community, making transportation extension a definite part of city planning programs on a broad constructive basis, co-operation between management and employees, scrapping of archaic franchise agreements by the substitution of terminable permits, and the revision of local transportation taxes along scientific lines. An abstract of Mr. Storrs' address is published elsewhere in this issue.

J. F. Egolf, president of the Illinois Electric Railway Association, said that a vision of the future of the industry is beginning to open up under the inspiration offered by leaders of thought. Only faith in the industry itself and demonstrated sincerity in putting into practice the expressed principles of public service will bring about success, he added. In the case of electric railways, he explained that the customer must be induced to go after his service. Unless it is sufficiently attractive failure will result. In some cases, he held, managements have been lacking in imagination and in the vision necessary successfully to carry the burdens and responsibilities of public service.

Taking as his evidence the simple fact that electric railways did not succumb during the trying years following the war, D. W. Snyder, Jr., vice-president Illinois Traction System, declared in a paper on the future of the industry that this is most conclusive proof that the service rendered is essential in every sense of the word. An abstract of Mr. Snyder's paper is published elsewhere in this issue.

A paper on the rehabilitation of elec-

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 2 — Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8:00 p.m.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

April 21-23 — American Welding Society, annual meeting, Engineering Societies Building, 29 West 39th Street, New York City.

April 23—Metropolitan Section, American Institute of Electrical Engineers, Engineering Societies Building, New York City, 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J.

June 25-26 — New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

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tric railway properties, prepared by A. P. Alshuler, general attorney Western United Gas & Electric Company and Aurora, Elgin & Fox River Electric Company, was presented by John Flannigan. Mr. Alshuler said the public is principally concerned in service and that when properly informed will grant rates of fare sufficient to maintain good transportation. He said that if electric railways had done their part in the past by laying the facts effectively before the public, the difficulties experienced in obtaining fare increases to meet post-war conditions would not have occurred.

"What a commentary!" he declared, "That we must resort to the courts when an ordinance expires, so that we may be permitted to serve the public which requires service; that we must resort to courts to obtain fares so we may exist to serve the public requiring service." He said that the present form of limited term franchise is a ridiculous arrangement that results in periodic interruption of railway development. In seeking improvements, he recommended that owners, operators and employees maintain confidence in the fairness of the public. The industry has suffered from early promotional abuses, he explained, and it requires years of earnest endeavor to restore them completely in the public mind.

Bus Operation Requires Knowledge of Job

Knowledge of the job was held by B. W. Arnold, assistant general manager Chicago, North Shore & Milwaukee Railroad, as the most essential requirement for successful bus operation. He cautioned against undertaking the operation of buses when there is lack of faith in the results to be accomplished. An abstract of his paper is published elsewhere in this issue.

H. H. Adams, superintendent of shops and equipment Chicago Surface Lines, discussed the maintenance of equipment in its relation to reliability of service and the demands of schedule requirements. He said that eternal vigilance is the price of satisfactory results. This includes not only the day-to-day operations and the systematic inspection of the entire car at regular intervals, but also requires that certain critical points be subjected to thorough examination at seasonal periods. These include rheostats and their leads, motor connection boxes, fuse boxes, trolley connections at bases, lightning arresters and similar points at which trouble sometimes develops. Mr. Adams said that inspection of cars on a kilowatt-hour basis instead of a mileage basis had resulted in increasing the mileage between inspection on the Chicago Surface Lines approximately 30 per cent.

New Devices Facilitate Maintenance in Chicago

The use of a Wheatstone bridge ohmmeter for detecting open circuits in armatures has proved particularly successful, according to Mr. Adams. He said that this method is preferable to the customary growler or battery buzzer test and results in the detection of armature defects that would be missed with the ordinary tests. Armature leads that are only partly broken through have been detected by this new method since it was adopted. As a result of the improvement effected, the number of armatures brought into the shop for open circuits has been considerably reduced. During the year 1925 this number was 12 per cent lower than in 1924.

Another improvement in maintenance practice that has resulted in a considerable reduction in service failures while at the same time effecting large savings in the cost of rewinding armatures, according to Mr. Adams, is the installation of chrome-nickel alloy armature shafts in place of quenched and tempered carbon steel material. The process of substituting these alloy shafts has been carried on for a period of about six years. During that time 3,200 shafts have been installed and only two failures have occurred. In each of these cases the cause of failure was determined.

The magnitude of maintenance operations on a property as large as the Chicago Surface Lines was illustrated through the presentation of several statistical items. During the fiscal year ended Jan. 31, 1926, there were rewound at the two shops of the company 29½ per cent of all the armatures in operating passenger cars, including air compressor armatures. During the same period, 12,121 new wheels were installed, 15,207 pairs of wheels were turned, 1,467 cars were overhauled and painted and 1,441 cars were repaired for damages.

Overhaul of cars is conducted on a two-year basis, which requires half of the equipment owned to pass through the shops each year. To meet the requirement of keeping a maximum number of cars in service, this overhaul work, together with the repair of damaged cars, must be carried on with a minimum number of cars in the shops. In the two shops of the company, 68 cars are required for an overhaul output of 32 cars per week, or an average of 2⅛ cars in the shops for each car turned out.

Mr. Adams described the steps taken by his department to put the maximum possible number of cars in service during the heavy traffic period immediately preceding the Christmas holidays. For a nine-day period from Dec. 14 to Dec. 24 there was available for service 99.5 per cent of the total equipment owned, and for the two days immediately preceding Christmas this was increased to 99.8 per cent. Out of a total of 3,539 cars, all but seven were operated during this two-day period.

Other Maintenance Practices Are Discussed

Maintenance practices of the Chicago, North Shore & Milwaukee Railroad were described by Henry Cordell, master mechanic, in a discussion of Mr. Adams' paper. One-man operating methods of the Aurora, Elgin & Fox River Electric Company were outlined by J. C. Johnson, superintendent. He said that the employees, who at first were opposed to one-man operation, had since become converted to this more economical and satisfactory plan for increasing service and reducing operating cost. Forms and routine practices of the transportation department were described by Mr. Johnson. New cars of the company are equipped with Economy meters and the record of each operator is posted for comparison. Energy consumption averages 0.98 kw.-hr. per car-mile for the small city cars and 1.57 kw.-hr. per car-mile for both city and interurban cars.

C. F. Handshy, Illinois Traction System, was elected president for the ensuing year. G. W. Welsh, East St. Louis & Suburban Railway, and R. F. Palmblade, Illinois Power & Light Corporation, became first and second vice-presidents, respectively. Members of the executive committee elected to fill expiring terms were D. W. Snyder, Jr., J. R. Blackhall and E. J. Blair.

Attendance at the Joint Convention of the Illinois Electric Railway, Gas and Electric Associations Bulked Large, as the Group Shows

Bluff Point Selected for New York State Meeting

HOTEL CHAMPLAIN, Bluff Point, N. Y., has just been selected by the executive committee of the New York Electric Railway Association for the annual meeting of that body. The sessions will be held on Friday and Saturday, June 25 and 26. This place has been a favorite with the association for many years and a good convention may be expected. Facilities for golf and water sports are available for members and guests.

The program is being prepared and an announcement regarding it will be made in a future issue.

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Concentrate on the Future—There Lies Opportunity*

Complete Co-ordination of Local Transportation, Inclusive of Transportation in City Planning, Co-operation of Employees, Adoption of Terminable Permits and Relief from Burdensome Taxes Constitute Major Objectives for the Industry

By Lucius S. Storrs
Managing Director American Electric Railway Association

CONTRAST between the local transportation situation in 1900 and that of last year, both locally and nationally, is most striking. In round numbers, three times as many persons, a total of approximately 16,000,000,000, were carried by electric railways during last year as were carried 25 years ago. Illinois did a little better than to maintain the national average, carrying last year in the neighborhood of 2,000,000,000 passengers as compared with approximately 500,000,000 a quarter of a century ago.

I merely point out these facts, touching on ancient history, to show that we are progressing. The thing that I particularly want to discuss, however, is not what we have done in the last quarter of a century, but what we are doing today and the necessity for our planning extensions at least a quarter of a century ahead.

When an individual begins to overindulge in reminiscence it is a pretty good sign that his arteries are hardening and his step soon will begin to slow up. Likewise, when an industry devotes its principal discussions to past endeavors, it is a danger sign of losing step with progress.

Must Keep Ahead of Times

Local transportation men particularly should realize the necessity for keeping ahead of the times in their business. The fact that their keenest competition in the last 25 years has come from an industry which had no history to which to refer nor any time-worn methods of operation to restrict its activities should be sufficient proof of the wisdom of focusing our principal efforts on the future rather than on the past. Surveys are beneficial sometimes, but it has occurred to me, especially in these days of rapidly changing transportation methods, that searchlighting the future is far more beneficial to us than surveying the past. Every local transportation man in the United States who is going ahead—and the number of them is legion — today has his searchlight on the future. Furthermore, the outline of what the future holds is becoming clearer almost daily, and, hence, we are able to formulate our plans with definiteness.

Careful consideration of transportation requirements of the present and future show the need for the following principles:

1. Complete co-ordination of local transportation, by rail, bus and any other practical service which may be devised, to be operated by single managements, preferably those now in charge of electric railways, because of their experience in rendering service.

2. The making of transportation extensions a part of definite city planning programs designed to meet requirements for long periods of years, and not haphazardly done to meet immediate needs, individual or group desires.

3. The closest co-operation between employees and employers in improving service and selling it to the public.

4. Scrapping of archaic franchise agreements and universal adoption of the terminable permit.

5. Revision of electric railway and other local transportation taxes along scientific lines.

I do not maintain that there are no other subjects which require attention, but the foregoing five seem to me to be pre-eminent now and give promise of remaining of outstanding importance for some years to come.

Very few persons nowadays seriously question the advisability of co-ordination of all local transportation service under single managements, but there is a wide divergence of opinion on what constitutes co-ordination.

The attitude of the electric railway industry should be that permission to render co-ordinated service carries with it an obligation to give the most comfortable ride with the fewest possible transfers. Distinctly, it should not be interpreted as meaning that an electric railway company would have discharged its obligations of co-ordination when it continues to run its same old cars under the same old plans, and adds one or two buses in order that it may be said to be operating buses in conjunction with its electric lines. Fortunately, not many managements are assuming this attitude.

Use of Buses Rapidly Extended

What is happening is that some 275 electric railway companies in this country are establishing up-to-date co-ordinated service with both buses and street cars. The number of buses now being used by electric railways is in the neighborhood of 6,000 and they are covering some 12,000 miles of route, practically all of which is new.

The whole question of co-ordinated service still is an open one. Save for a few general principles, little of a definite nature has been established regarding the best methods of operation. It has been proved that bus transportation cannot be provided as cheaply as rail car rides and that 10-cent minimum local fares should be established except on short routes in the most densely populated communities, that buses often may be advantageously substituted for non-paying rail lines and that a good outside business can be built up by chartering buses to special parties. It also has been established very definitely that buses cannot be successfully run in a haphazard manner any more than can electric cars. A speaker at one of our recent meetings in Chicago summarized the situation very well the other day when he said that you couldn't run bus lines with carpenters. The automotive business is one requiring the services of experts, and when you go into the bus business you had better make up your mind to hire the best available automotive experts to look after your property. Otherwise you won't have much automotive property very long.

The one thing that has been definitely established above all else by practical experience is that the bus is not going to supplant surface car lines in large communities to any appreciable degree. Much misinformation has been passed around regarding the possibility of buses supplanting cars, but the fact remains that they do not do it to any extent. One of the most recent cases of misinformation along this line has come within the last few weeks in connection with a proposal to substitute bus service for some 200 cars in the city of New York. I am going to take just a moment to give you the facts in that case because you not only should know them, but you should carry them home to your riders.

New York Bus Situation Misinterpreted

For some years the New York Railways Company has been operating street cars on 25 of its 73 miles of track at a loss under the 5-cent fare. Recently it made an arrangement with the Fifth Avenue Coach Company to make a proposal to the city that buses be substituted, under a 5 and 10-cent fare arrangement, for street cars on the present unprofitable 5-cent lines. The short crosstown rides would be 5 cents, but the longer up and down town rides 10 cents.

Compared with the city's total riders, the number affected by the proposed change would be small. Passengers carried on the cars operated over this 25 miles of non-paying track in 1925 represent about 4 per cent of the city's surface lines' total of 1,035,977,724 revenue riders, and this surface line traffic is 36 per cent of all electric railway passengers. Subway and elevated lines carried 62 per cent, or 1,680,800,254 passengers.

Various individuals and groups have hailed this proposal as marking the "obsolescence of the trolley." It is nothing of the kind. This suggestion is simply another move to carry out a definite policy of the local transportation industry. That policy is to render service either by electric railways or buses, and particularly to supplant non-paying lines with buses at a rate of fare which will insure fair earnings. There have been similar replacements proportionally as great elsewhere in the past, but invariably the electric railway has remained the backbone of the system.

Incidentally, it always should be remembered that a distinctly local situation exists in New York transportation. Subways provide the backbone of service, and all other means of transportation are necessarily of a supplemental character. In most cities the local electric railway property is the main artery of local transportation as the

*Abstract of address before annual meeting of Illinois Utilities Associations, Springfield, Ill., March 17, 18, 1926.

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subway is in New York. To talk of doing away with surface lines in most cities is equivalent to talking abandonment of subways in New York. And that isn't being done.

The unassailable truth is that prospects for the future of the electric rail lines manned by progressive managements in communities where service is warranted never were better. Neither the private automobile nor the bus is going to put the electric railway lines out of business. Every evidence points to the fact that the pleasure car eventually is going to be a great help in returning riders to cars and buses. Street congestion, caused by the increase in the number of pleasure cars, is rapidly driving people back to use electric line service. This congestion is steadily becoming worse. More and more the public must depend on electric railways, not only to carry them, but also to carry their intercity freight. I cannot see how anyone can fail to appreciate the facts in this situation, nor can I see why electric railway executives and city officials alike are not now planning ahead for the time when the electric railway must be of greater service because of this present congestion problem.

Careful Planning for Future Needed

The question of local transportation as built around the electric railway is a growing one and it is not going to be settled by slipshod planning. It is going to be settled by city officials, business men, traffic experts, leaders of civic thought and operators and owners of local transportation properties sitting down together and scientifically planning for the future.

Everyone should appreciate that a city without adequate transportation is as helpless as a man without legs. It is folly to plan general city improvements without first taking into consideration the transportation service. Likewise, it is folly to plan transportation service independent of other city activities. In the past there has been entirely too much independent action on all sides. Skyscrapers have been erected, new sections developed, traffic regulations adopted and other steps vitally affecting transportation taken with only passing consideration of the effects on the car rider. In this regard especially should the 25-year searchlight be turned on the situation. City planning on a 25-year basis embraces a brief enough period. Yet the leaders of very few communities now are working on a quarter of a century basis.

Consideration of the kind of contract with the community under which the local transportation company should operate dovetails naturally into the subjects of co-ordinated service and city planning. The old-time limited franchise has run its day, and leaders of thought throughout the country are recognizing this fact. Within recent years the terminable permit has been substituted for the limited franchise in half a dozen states and today it is gaining headway rapidly.

The terminable permit is really a very simple thing. Unfortunately, it has been shrouded in mystery and bogged down in legal phraseology to the confusion of utility expert and layman alike. In simple language it is a permit to operate during good behavior. The manifold advantages of the terminable permit arrangement are obvious. They are particularly helpful in financing. Bankers much prefer to deal with a company operating under such a permit. This fact is of particular importance to local transportation companies at the present time because so many of them need new financing.

The reason bankers like the terminable permit is that under its operation the possibility of recurring franchise fights is eliminated. They long have been the cause of much trouble. Many things have been written into franchises in order to assure their passage which never should have been in them. Often methods used to assure passage of franchises have been questionable. The blame for this latter situation belongs alike on the public and its representatives and the utility managements. It has redounded to the credit of neither.

You have in Illinois at present a most striking example of a crying need for the terminable permit. I refer to the situation in which the citizens of Chicago find themselves in relation to their surface transportation service. Here is a case where the company is rendering splendid service, carrying nearly 850,000,000 passengers a year, making a good return on an investment which is profitable both to the company and the city, and yet, because its franchise expires next year and some $160,000,000 of its bonds automatically become due, its whole future is in a fog. By every rule of reason this company should be permitted to continue to render service without interruption. Its operating record alone should guarantee this privilege. At present more than 99 per cent of the rolling stock of this organization is in actual use. It is rendering a high type of service. It has efficient employees and executives of the progressive type. In truth, any city in the United States should be proud to have such service as now is being rendered in Chicago by the Surface Lines organization.

If this company had a terminable permit, its smoothly running machinery would not be interrupted for a single day. But having an old-style franchise, which is as out of date as a mustache cup, there is no telling what the future holds for it. While, of course, the citizens of Chicago are not going to permit the operation of such a splendidly functioning property as the Chicago Surface Lines to be interrupted for an extended period, nobody knows just how the problem is going to be solved. The Illinois people, however, are approaching this situation in an intelligent way and I feel sure that the recommendations of your legislative committee will be progressive. Certainly, it could take no greater forward step than to indorse unreservedly the terminable permit plan.

About half a dozen states now have adopted the principle of the terminable permit, and its provisions are steadily becoming more popular. I predict that when your association meets a quarter of a century hence to celebrate its golden anniversary, its members will marvel at the long time it required to bring the terminable permit into nation-wide use. If its merits are properly presented by utility men, I sincerely believe that more than a majority of the states will have adopted the plan within the next five years.

Employee Enthusiasm Necessary to Success

A business which is so dependent for its success on the good will of the public as a utility is should avail itself of every legitimate means of friendlyizing its customers. In our employees, not only in the transportation field but throughout the entire utility business, we have an army of potential salesmen eager, when properly trained, to be of assistance to us in selling our goods.

A great deal has been said at utility conventions in recent years about "public relations." So much, in fact, that I sometimes think the phrase has become a stock one and that the words are frequently rolled off the tongues of speakers without a proper appreciation of their meaning or importance. Of greater concern to all of us just now, however, should be employee relations. Good relations with employees must precede good public relations.

The training of employees to be helpful in selling their company to the public cannot be performed by just anyone to whom the job is assigned. Primarily, enlisting the co-operation of an employee is the work of a high executive of a sympathetic and friendly nature. He must create in the employee a desire to render the selling service wanted. Rules, regulations and lectures on the duty of the employee to become a good representative of the company never will instill in him the desire. You must create in that employee first of all an interest in his job. The shortest way to create this interest is to arouse interest in himself and his own welfare. This can be done by showing him that the standing of his company with the public and its prosperity is of direct personal interest to him. The job to most of us is the most interesting thing in life, and to arouse greater interest in this job and thus arouse greater interest in the company's welfare is to win an employee's undivided support.

Once this interest is aroused and the company's problems are made plain to the employee, he will become an agent of great value. The job, however, must hold out some incentive. You cannot expect an employee to respond enthusiastically to platitudes uttered in a half-hearted tone by some near-executive. Enthusiasm for the job is created only by those who believe in our industry.

The record of attempts to convert employees into salesmen in the utility business speaks for itself. These attempts have been just about as successful as they have been wise. Companies throughout the land which have inaugurated popularizing campaigns founded on sincerity and a desire to do the right thing by their employees and the public, and directed by a real executive, have been successful. The failures in such campaigns can be traced largely to companies that had little to offer and tried to make the

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campaign a duty instead of a pleasure and a profit. In many cases of failure the job was assigned to a man who did it indifferently.

Electric railways are carrying an unfair taxation burden and for the sake of improved service, at least, they should be relieved from it. Approximately one-tenth of all the gross income of electric railways now is paid out in local, state and national taxes. This is the largest tax in proportion to gross income which any national industry pays. It is the direct result of legislative bodies loading up utilities with levies merely because this seemed to be the quickest and surest way of getting money. As a result of these onerous tax burdens many companies in recent years have paid out more in taxes than they have earned in net incomes. But what is of more interest to everyone affected by good or bad transportation is that service in many cases has been impaired by this unfair tax load. It is safe to say that if a fair readjustment of taxes were made, service could be improved proportionally on every electric railway in the country.

Relief is being afforded in many sections, particularly in relation to the paving tax. This archaic levy, originatating in the days of horse cars when old Dobbin wore out the paving between the rails, is so obviously unfair that three states and 50 communities have relieved transportation companies from it. Doubtless further relief from this tax will be widespread in the next few years. It is wholly indefensible.

I have addressed myself particularly to transportation problems, but I believe most of them relate in some way to the entire utility industry. Our job is a common one. We should work together and not as individuals. Our object is to give the best possible service to the whole public. We can accomplish this best by standing shoulder to shoulder and helping one another.

In this city of Springfield, hallowed by the presence in Oak Ridge Cemetery of the mortal remains of the great emancipator, we can do no better than be guided in our endeavors by his words: "Let us have faith that right makes might; and in that faith let us dare to do our duty as we understand it."

Electric Railway Trend Is Upward and Onward*

Survival of Unprecedented Hardships Is Proof of Essential Nature of Service Rendered—Small Railway in Large Utility Group Is Sometimes Neglected—Modernization Has Saved Many Lines

BY D. W. SNYDER, JR.
Vice-President Illinois Power & Light Company

ANY student, or even casual reader, of the history of the steam railways knows of the doubts and disappointments of the early days of railroading; the failures and reorganizations in 1873 and again in 1893; the public antagonism that produced drastic and oppressive regulation, resulting in a reduced net that so handicapped the railroads just prior to the war period. We know of government operation and control and the disastrous period of readjustment, and how in 1920 the combined net of class "A" roads dropped to less than $100,000,000.

We also know that throughout these periods of stress the railroad managements did not lose courage. The Hills, Harrimans, Markhams and Van Sweringens refused to accept defeat, and today we find the great majority of the country's railroad mileage in splendid physical shape, with ample equipment in good condition. Public opinion is friendly and regulation is more reasonable. Today railroad credit is better than in years and the combined net last year of class "A" roads exceeded $900,000,000.

All of the transportation problems are not yet and never will be permanently solved. The railroads are still faced with the disposition of many unprofitable short lines, unregulated bus and truck competition, wage and rate controversies. The important thing is that the railroads have proved that they are an essential industry, that they did not lose courage in times of distress and that the public was not unmindful of their rights. Because of these facts the industry as a whole is today on a sound foundation.

The gas companies can point to a very similar experience. Today the industry is on a most stable basis, and again the reasons are that the business proved itself an essential industry, that its leaders had courage and that the public will be fair if given the facts.

How does the electric railway industry measure up according to these yardsticks? Is it an essential industry? The answer is "Yes," if their service is of value to the community or territory which they serve. If their service is of value, I firmly believe that the community or territory will pay adequately for a job well done.

One measure of value of electric railway service is its use. By this measure the railways have proved themselves of essential value. The American Electric Railway Association tabulation of a large percentage of the railways of the country showed that the electric railway properties carried 39,715,479 more passengers during the last six months than in the same period a year ago. The report for last month showed that 6,426,176 more passengers were carried in February, this year, than in February, 1925. Reports from Illinois properties are likewise favorable. The number of passengers carried, according to recent reports, are increasing on the city lines in Chicago and on the four largest electric interurban railways in this state. The interurban railways are rapidly expanding their freight and express facilities. One system in Illinois last year increased its freight business more than half a million dollars. A combined statement of passengers handled by the electric railways, including bus auxiliaries, in the cities of Danville, Champaign, Decatur, Bloomington, Peoria and Quincy shows an increase of more than a million riders in 1925 as compared with 1924.

Recently here in Springfield the citizens of one of the less densely settled sections of the city insisted on retaining street railway service on steel rails instead of a proffered bus service. The street railway company, by substituting buses, desired to save the rather large capital investment in new tracks and paving. The citizens, however, are property owners and they know the value of street railway service, both as to the convenience and cheapness of transportation and also as it affects real estate values.

INDUSTRY SURVIVED UNPRECEDENTED HARDSHIPS

Prior to the period immediately preceding the World War the general prosperity of the electric railroads was gradually reflected in the franchise and tax burden which they freely accepted and doubted not their ability to pay. The amazingly rapid increase in the number of motor vehicles and the hard-surfaced street and highway construction programs that followed, coupled with the increased costs incident to the war period, literally changed the golden day of prosperity of the industry to a black night of despair. These suddenly changed conditions resulted in receiverships, abandonments, violent labor disputes, collapse of credit and, of course, impairment of service. Never was so vast a national industry and one so important to the welfare of the people faced with such difficulties. The uneconomic franchise and tax burdens were fixed for long-term periods by contract, the public had been educated for years to the belief that the convenient nickel was the proper and fixed street car fare, the investment bankers had lost confidence, and many people seriously thought that the jitney auto would supplant the electric cars. Young men avoided entering the industry. The demagogue and peanut politician still believed that the street railway was a good ladder on which to climb into public office.

It seems to me that the simple fact that the electric railways did not succumb during these trying years is most conclusive proof that the industry is essential in every sense of the word.

MODERNIZATION PROGRAM SAVED MANY LIVES

The street railway industry is to be congratulated on the courage of its leadership. It has been guided back from the darker days of the war period. Receiverships are gradually being lifted. The introduction of the one-man car and a modernization program have saved many lines. The city and interurban lines are utilizing buses more adequately to serve their territories. The interurbans are intensively and successfully developing their freight and express opportunities. The bankers are again having confidence. The manufacturers are helpfully alive to the

*Abstract of paper before annual meeting of Illinois Electric Railway Association, Springfield, Ill., March 17, 18, 1926.

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situation. The public is better informed.

Therefore, I believe the electric railway industry trend is onward and upward and will eventually reach its goal of adequate service to the public—this at a cost consistent with a return to the stockholders that will secure the necessary supply of new capital to develop and expand the transportation needs of the community or territory served.

Not all electric railways will recover, as some lines should never have been built. Good management cannot overcome the initial bad judgment of the builders. Fortunately, most of the electric railways serve well-populated and growing communities and are not in the above class.

Recently I attended a gathering of railway executives, most of whom were either operating large railway properties or were operating large combination properties of electric railway, electric and gas utilities. The expressions of most of these men were optimistic, and I overheard an executive from a comparatively small city whisper to his neighbor, "This sort of talk is all right, but it doesn't put the people on the cars."

Small Railway Unpopular in Combined Management

The problem facing railway operation in the smaller cities from 25,000 to 50,000 people is somewhat more complicated than that of the large city systems. Most of these railway properties are operated as part of a combined gas, electric and railway property. In this combination there is both strength and weakness. The elements of strength are well known and need not be mentioned in this paper; the elements of weakness are rather vital and I believe can be profitably discussed.

The "combination" manager, during the last few years, has had the experience of having most of his troubles come from the railway department and most of his business growth in the gas and electric departments. He has learned that a given amount of energy and effort and capital in the gas or electric department will bring just now greater returns than in his street railway. He has been bombarded by the broadsides of the automotive industry and listened to the siren songs of the bus salesman. He probably drives his own private auto, using his gas and electric interests as a reason, and has unconsciously been weaned away from his street railway. He has, in most cases, a capable old-time railway organization that maintains the equipment in good condition, keeps the cars clean and well painted, properly operated and on schedule. He has from time to time, as he saw the wrong color of ink on his railway reports, spurred his organization to better efforts, which usually cease when the executive pressure ceases.

This manager usually has a satisfactory combined property showing, and, being human, tends toward following the line of least resistance. No man, however, ever accomplished any worthwhile thing following the line of least resistance.

The result of such a condition is the gradual but inevitable conclusion in the mind of such a manager that the railways are doomed, and from then on his railway will begin to prove his conclusions. Capital expenditures are withheld, maintenance is curtailed, frequently the supervision and traffic departments are cut. Such measures will afford temporary relief, but only serve to augment the trouble in the immediate future, due to the inevitable impairment of the service. Instead of such curtailment methods, I recommend to managers who have lost heart an honest trial of Mr. Storrs' daily dozen. I believe they will be agreeably surprised at the results.

In concluding, I can only repeat that a large portion of the industry is surely on the mend, that the remaining problems are a challenge to the men in our industry and I firmly believe that this challenge will be successfully met.

Operate Motor Coaches for Profit, Not Loss*

Pessimistic Attitude Toward Possibilities of Motor Coaches Will Inevitably Result in Loss—Too Many Railways Have Started Bus Operation with This Viewpoint

By B. W. Arnold
Assistant General Manager Chicago, North Shore & Milwaukee Railroad

WHEN we, as railway operators, were confronted with the automobile problem, which gradually grew more serious first from jitney operation and then moved to the larger type of a carryall known as the motor bus, we were a little bit slow in realizing what it was all about. The vehicle was usually some sort of a body, built upon a truck chassis, without any thought as to spring arrangement or to the comfort of the occupants. It is strange that, even with this crude vehicle, a great many electric railways saw passenger earnings decrease by reason of competition with one of these conveyances which the public was pleased to call a motor bus.

When the automobile and bus first began to affect passenger receipts many railway operators looked with considerable distrust upon any automotive vehicle, except the ones they drove to the office, but wondered why the people did not ride the street cars. A great many of them knew that sections of their communities had been developed to the point where transportation was needed, but in many cases a lack of foresight, combined with lack of capital, prevented them from providing the additional facilities. The result was that many individuals with exaggerated ideas of the earnings of transportation companies started to operate various sorts of motor buses to serve newly developed territories. In a great many cases such vehicles were operated down into the center of the communities, paralleling existing railway lines and picking up business which naturally would have gone to the railway. This private bus operation was looked upon with favor by a great many city officials, especially those of the old type who still continued to think that the utility serving their city constituted an excellent political football and that the bus gave them a valuable ally to assist in kicking it around.

The present effort of railway companies to promote good will and their willingness to spend real money for this purpose was not in vogue when the bus first appeared. In a great many cases, instead of investigating this new type of transportation, railway managements added a prefix to the word "bus," and to the industry as a whole it became the "damn bus." The automobile manufacturers were not slow in seeing that there was a field for the new vehicle and in a great many cases assisted materially in financing pirate operators running parallel with existing transportation facilities. In fact, I am quite sure that a great many motor coach routes, established by high-pressure automobile salesmen, will be abandoned due to the fact that the population is not sufficient to give earnings necessary for their operation.

Progressive Operators Realized Responsibility

Several of the thinking operators whose minds were open and who realized that they were in the transportation business, and not simply in the railway business, commenced to make exhaustive investigations of bus operation. The responsibility of any transportation agency, as such men saw it, includes the full obligation of the name; that is to supply transportation in the territory they serve and to carry the people of this territory in whatever manner they want to travel, whether it be on rails with electric cars, on the highways with rubber tires, or in the air.

The North Shore Line was one of the first to recognize in the motor coach a valuable ally with which to supply transportation to newly developed communities in need of such service, without the necessity of heavy investment in track and overhead construction. A city motor coach line was established in Waukegan in 1923 to serve a part of the city not touched by the railway. The same fare was charged on the coaches as on the street cars. Transfers were issued and accepted between car and coach. This division, within a very short time, was able to pay its way in addition to putting on to the railroad passengers which it would not have carried had it not been for the motor coach. There was an immediate development in the territory served by this line and it has been necessary to reduce headways and supply additional equipment twice since the line was started.

The main line of the North Shore electrically operated railroad, which extends 85 miles from Chicago to Milwaukee and parallels Lake Michigan for the entire distance, is so situated that all feeder divisions must come from the west, having nothing but the lake on the east for the entire distance.

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Such lines have been established from Lake Geneva, a distance of 32 miles; from McHenry to Waukegan, a distance of 25 miles; from Channel Lake to Waukegan, a distance of 25 miles; from Wheeling to Glencoe, a distance of 8 miles; from Deerfield to Highland Park, a distance of 4 miles, and from Glenview to Wilmette, a distance of 5 miles. Lines parallel to the railway have been placed in operation between Deerfield and Glenview and between Waukegan and Kenosha, both being operated on state trunk highways at a distance of about 2 miles from the railroad. These lines have all been the means of developing the territory adjacent to the railroad property and by doing so are putting on to the railroad a considerable number of new passengers.

These feeder lines serve, to a large extent, the lake territory of northern Illinois and southern Wisconsin, all of which is tributary to Chicago. The population of Chicago and its suburbs, being more than 3,000,000, gives a wonderful field for the development of combined rail and motor coach trips. At several different points on our interurban routes during the winter months detours are made to pick up school children attending school in the cities. While from a revenue standpoint this has not been altogether attractive, it has built for us a spirit of good will on the part of the communities adjacent to our railroad which could not have been accomplished in any other manner.

Bus Feeders Serve Three Purposes

Bus feeders in connection with railway operation, as we see it, have three functions to perform: Properly to serve the territory adjacent to the railroad property; to add revenue to the railroad; to create, foster and maintain proper public relations, which we have found to be so necessary in the conduct of our business. We should remember that at the start in new communities very few lines, either motor coach or railroad, can be counted as paying ventures. Nevertheless they are very necessary in the development of the communities served.

Careful thought should be given to the selection of motor coach equipment. All too frequently equipment is provided which cannot be operated with any degree of satisfaction or with any promise of satisfactory financial return. The maintenance of this equipment is something that must require the attention of the operators. In too many cases railway companies have attempted to maintain automotive equipment with carpenters, car cleaners and trackmen. On one railway property with which I am familiar and where they are operating motor coaches I found on a recent visit that the barber who had always shaved me in that city was in charge of motor coach equipment. The manager was wondering why it was costing him so much money to operate. This would not be tolerated in the maintenance of electric car equipment. We feel that specialists are required for such work. If that is so on the electric car why not on the motor coach?

Proper facilities for garaging and proper equipment for maintenance are absolutely necessary to the success of any motor coach operation. Careful attention must be given to tire costs, gas consumption and lubrication methods. Competition between drivers in connection with these matters should be encouraged. I believe that one of the causes for unsatisfactory results obtained by a great many railway companies in the operation of motor coaches is that they have not gone at the job wholeheartedly and have admitted defeat before they started.

Don't Start Out to Lose Money

I was very much impressed at Atlantic City last October, in listening to the discussions of the report of the committee on bus operation, to hear no less than six or seven executives start their talks with the statement that they did not want to go into the bus business, but had been forced to do so and expected to lose money. I am quite sure that any one who embarks in any business with that feeling will obtain exactly the results that he anticipates. I once heard a traveling man say that the first necessity of a successful salesman was to believe in what he was selling; know it, and show it. That, I believe, is the point of view necessary in the operation of motor coaches in connection with our railway lines.

New England Club Holds Annual Banquet

UNQUESTIONABLE evidence of the growing enthusiasm in the industry characterised the 26th annual banquet of the New England Street Railway Club at the Copley Plaza Hotel in Boston on March 25. Latest returns from the membership drive that was conducted through the year under the able leadership of J. B. Crawford, Concord, N. H., showed 225 new members. The result was an attendance at the banquet that crowded to capacity the spacious ball room of the Copley Plaza hotel.

For the first time in the club's 26 years of activity the ladies were invited to the annual meeting. Their interest was manifested by the large number who responded and augurs well for a repetition of the invitation at future meetings.

At a short business meeting preceding the dinner the following officers were elected for the ensuing year: President, F. D. Gordon, Portland, Me.; vice-presidents, H. F. Fritch, Boston, Mass.; J. K. Punderford, New Haven, Conn.; John B. Crawford, Concord, N. H.; T. B. Jones, Burlington, Vt.; E. M. Graham, Bangor, Me., W. C. Slade, Providence, R. I.; secretary, J. W. Belling, Boston, Mass.; treasurer, Fred F. Stockwell, Cambridge, Mass.

Executive committee members elected were as follows: H. M. Steward, F. B. Walker, H. R. Whitney, C. C. Peirce, H. S. Day, E. W. Davis, P. P. Crafts.

Short addresses on the work of the club by retiring president L. D. Pellissier and president-elect F. D. Gordon, opened the speaking program after the dinner. Labert St. Clair, American Electric Railway Associjation, acted as toastmaster. Speakers included W. S. Vivian, Chicago; C. C. Peirce, Boston, and Dr. John L. Davis, New York. Vocal selections by Rose des Rosiers of the San Carlos Grand Opera Company; exhibition dancing and general dancing completed the entertainment program.

American Association News

Power Transmission and Distribution

THE midyear meeting of the power transmission and distribution committee was held in Chicago, March 8 and 9. Tubular steel poles, review of manual sections, electric wire and cable terminology, specifications for galvanizing and sherardizing, design of cap and cone hangers, selection of poles for trolley line construction, specifications for rubber-covered wires and cables for power distribution purposes, specifications for electric conduit construction, line lightning arresters, catenary material specifications and trolley wire wear and specifications were the subjects discussed.

On the subject of radio interference Mr. Quinn stated that the committee had conducted a further series of tests using different types of receiving sets for picking up interferences, and it is submitting a report on the details of these tests. It appears to be a more serious factor since the sets now being used are more sensitive and can pick up the disturbances a greater distance away from the trolley wire and feeders. He also stated that it has been shown that interference can come from car buzzer circuits, light circuits, sparking at the trolley wire and the most serious place being the sparking at the rail and car wheel. It has also shown that interference of that kind on the trolley wire can be transferred to paralleling pole lines and can be transmitted a considerable distance from those lines.

Review of specifications for 600-volt direct suspension trolley overhead construction and joint use of poles were other matters considered.

It was decided to hold the June meeting at the association headquarters in New York on Monday and Tuesday, June 7 and 8.

Those present were C. H. Jones, J. W. Allen, J. C. Damon representing W. H. Bassett, M. W. Cooke, James H. Drew, D. D. Ewing, C. L. Hancock, C. J. Hixson, A. J. Klatte, F. McVittie, H. S. Murphy, J. F. Neild, W. J. Quinn, W. Schaake, A. Schlesinger, Mr. Casey representing G. F. Wennagel, and M. B. Rosevear. Guests included M. Aldrich, Chicago, South Shore & South Bend Railroad; Ralph Rice, board of supervising engineers Chicago Traction; P. E. Murray, Chicago Surface Lines; Mr. Smith, Ohio Brass Company; Dwight L. Smith, Chicago Rapid Transit Company, and C. Huttleston, Chicago, North Shore & Milwaukee Railroad.

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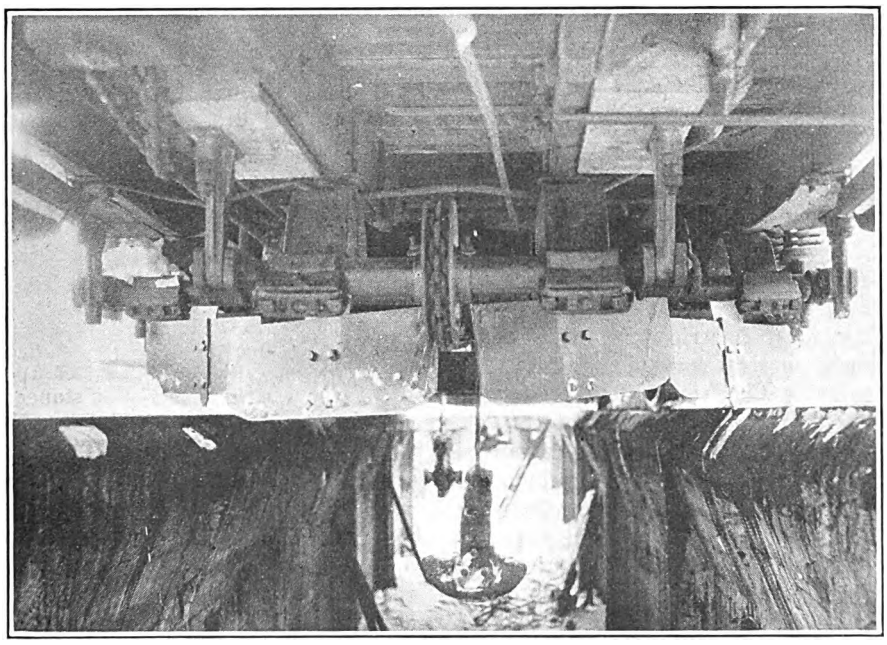
Maintenance Notes

Scraper Car a Handy Accessory

ONE of the principal troubles from a snowfall in the metropolitan district, New York City, comes from the packing down of the snow by automobile traffic running over the lines. As the subsurface contact system is used in New York, it is also desirable, when the snow melts, to provide some efficient method for cleaning the underground conduits. To assist in this work, the Eighth Avenue Railroad uses a scraper car. This is an old single-truck passenger car 32 ft. long. In order to gain adhesion, the car is loaded with scrap metal.



Arrangement of Scrapers for Removing Snow from Between Rails and 9 In Outside and for Cleaning the Slots and Tubes of Underground Conduits

An accompanying illustration shows the method of installing scrapers and a type of slot and tube scraper that is used. The scraper equipment is of No. 5 Kalamazoo type. The two center scrapers are clamped to a 2½-in. shaft. Clevis type bearings are used at the ends of this shaft and the two clevis castings fasten to two hangers which are supported from substantial wooden blocks attached to the underframing of the car. These blocks are 8 in. x 8 in. x 2 ft. long.

The two spring scrapers in the rear are fastened similarly to a 2½-in. shaft and hang through clevises and hangers to the car body. The scrapers are raised and lowered from the car platform by the motorman through a handwheel and pull rod. The pull rod is attached to a lever on the back shaft and the two shafts on which the scrapers are mounted are connected by sheaves and a chain. This type of scraper will clean snow from between the rails and 9 in. outside, throwing it each way from the center. It also cleans the rail and groove.

The form of the slot and tube scraper may be seen in the center part of the illustration at the back. This consists of a large casting with a rubber bottom and nose. This casting is fastened to the upper support by two side clevises. The upper support is a steel plate ⅜ in. x 10 in. x 28 in. It has a slot cut at the top 3 in. x 13 in. long to go over the beam on which it slides. This beam is provided with a carriage to provide for easy movement. The plate is held in place by two pins. All parts below the surface of the slot are insulated with oiled linen and friction tape. This provides a very effective method of cleaning out the underground conduits and the construction is such that there is no danger of it coming in contact with live parts to cause damage.

Portland Signal Failures Still Decreasing

BY H. J. CHARTERS
Portland Electric Power Company, Portland, Ore.

FAILURES of block signal apparatus are directly dependent upon three factors—speed of trains at contactor locations, maintenance, and weather conditions. This is conclusively shown by the annual signal report recently compiled by the Portland Electric Power Company, Portland, Ore. Information for the years 1921 to 1924 inclusive was given in ELECTRIC RAILWAY JOURNAL for Feb. 14, 1925. To this have now been added figures for 1925.

As presented in the report the item of No. 5 switch failures has been steadily increasing for the past three years since time-table changes made it imperative to use higher speed at contactor locations. The percentages of total failures were in 1923, 7.40; in 1924, 17.24, and in 1925, 15.55. Replacement of switches during 1925 undoubtedly reduced the number of failures from this cause during the year. The fact that most of the switch failures resulted from broken parts also reflects the cause as being too high a speed as distinguished from failures due to worn parts, faulty insulation, broken leads, etc.

During the year just past reconstruction of some of the pole lines carrying high-tension as well as railway wires was taken advantage of to replace parts of the signal lines and equipment. At such locations new directional relay housings were installed and all rubber-covered wire in pole cables and contactor leads was replaced. It is worthy of note that no failures due to those parts of the equipment were recorded. At other locations some of the relay boxes and wiring were replaced. The boxes used were constructed of first grade spruce and put together with

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BLOCK SIGNAL REPORT, PORTLAND ELECTRIC POWER COMPANY.
INTERURBAN LINES

	1921	1922	1923	1924	1925
Number of miles of track blocked:					
All divisions	21	21	21	21	21
Number of blocks	20	20	20	20	20
Number of signals	40	40	41	41	41
Total movement of signals	843,464	991,082	991,082	991,082	991,082
Average movement per block	42,173	49,554	49,554	49,554	49,554
Average daily movement per block	138	136	136	136	136
Number of movements per failure	7,148	13,393	9,103	17,088	22,024

ANALYSIS OF FAILURES

	1921		1922		1923		1924		1925	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Line wires	5	4.27	5	6.67	6	5.56	0	.....	2	4.45
Switch and pole wiring	2	1.71	3	4.05	12	11.11	3	5.17	2	4.45
Blown fuses	7	5.98	3	4.05	15	13.89	5	8.62	2	4.45
Directional relay	29	24.79	22	29.73	34	31.48	16	27.59	13	28.89
Signal trouble	6	5.13	1	1.35	3	2.78	1	1.72	2	4.45
Contactors	44	37.61	26	35.14	24	22.22	13	22.11	42	24.45
No. 5 switch	7	5.98	2	2.70	8	7.40	10	17.24	7	15.55
Miscellaneous	6	5.13	1	1.35	0	.....	4	6.89	1	2.20
No trouble found	11	9.40	11	14.87	6	5.56	6	10.34	5	11.11
Total	117	100	74	100	108	100	58	100	45	100

FAILURES BY MONTHS AND YEARS

	1921	1922	1923	1924	1925
January	..	6	22	2	8
February	..	5	10	3	4
March	11	3	13	5	7
April	13	8	8	5	2
May	17	4	8	4	2
June	9	15	16	10	2
July	16	8	6	8	3
August	12	1	8	5	2
September	8	1	4	3	2
October	6	8	2	7	3
November	16	6	6	1	6
December	10	9	5	5	4
Total	117	74	108	58	45

screws, then being well painted. This type of box has been in use for several years and gives very good service as it rarely weather checks and remains water-proof indefinitely.

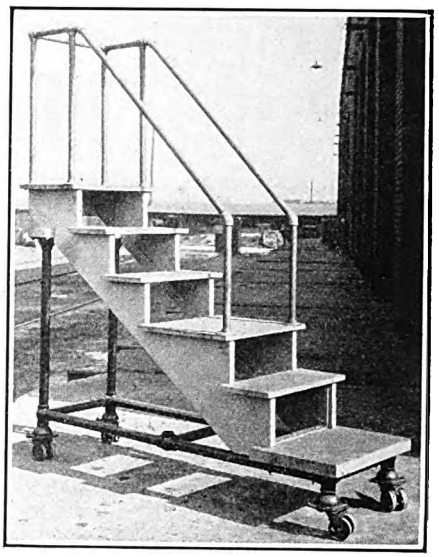
The weather conditions during most of 1925 were very favorable. These conditions are faithfully reflected in the table for failures by months and years. It will be noted that 42 per cent of the 1925 failures occurred in the first three months of the year. The winter of 1924 was quite mild, but during 1923 an excessive rainfall occurred during the first three months. This is clearly shown in the table, as is the fact that the wet month of June always registers a large number of failures.

In the report the number of movements per failure is computed on the basis of failure of the signal until repaired and not on failure of the signal to give correct indication—or, in other words, a failure is not recorded for each train passing the signal while out of order. While this may not be entirely correct from a signaling standpoint it simplifies reports and gives all essential information upon which maintenance methods may be based, except that of time elapsed before signal is restored to service. A signal movement is counted each time a car passes under a contactor, as it is thought this indicates more correctly the wear on lever bearings and arcing contacts.

Rolling Steps for Spray Painting

IN ORDER to obtain the greatest efficiency from use of spray painting, most electric railways are using some sort of portable scaffolding or movable platfrom. The accompanying illustration shows some movable steps that are used for this work in the Kenmore shops of the Northern Ohio Traction & Light Company, Akron, Ohio.

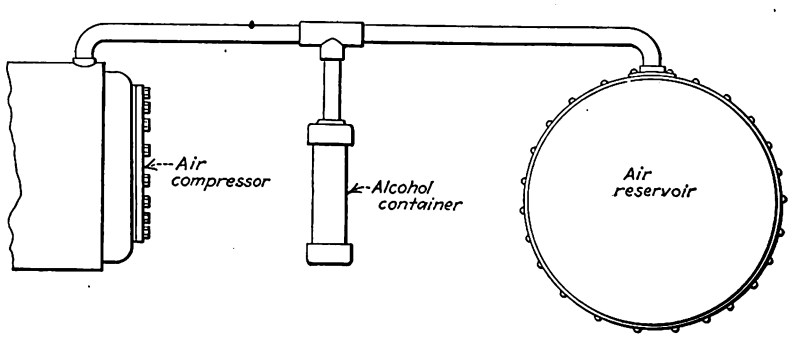
These steps consist of an iron pipe framework with four casters to permit easy rolling about the shop. The bottom step rests directly upon the iron pipe framework and five additional steps are supported by wooden risers. An iron pipe railing starts from the third step and extends so as to surround the top platform. This affords protection to the workman, particularly when he has to reach over in order to paint some inaccessible place. By the use of these movable steps painters can work alongside of the car and shove the platform ahead or back as desired without the necessity of dismounting each time a new location is to be painted.



Convenient Form of Portable Steps Used for Spray Painting in the Shops of the Northern Ohio Traction & Light Company

Small Alcohol Tank on Air Line

EXPERIMENTS are being made by Ben Singleton, shop foreman at Roseville carhouse, Public Service Railway, Newark, N. J., with alcohol vapor as a means to prevent freezing of air pipes. On each car a small alcohol container has been installed between the air compressor and the reservoir. A section of 2-in. pipe about 5 in. long capped at the bottom has been suspended by a T connection from the pipe connecting the pump and the tank. This container will carry approximately 1 pint of alcohol. The rate of evaporation averages about ½ pint per month, so that the supply in the container will last approximately 60 days. This device has



Fumes from Alcohol in the Container Pass Through the Pipe to the Air Reservoir and Prevent Freezing

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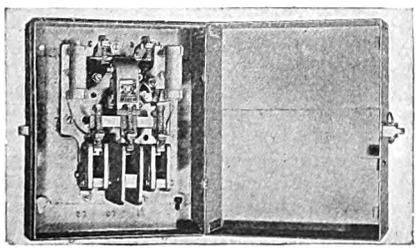
been installed on five cars and no trouble of any kind on account of freezing of air pipes has occurred since they were thus equipped.

New Equipment Available

Unit Construction for Starters

ACCESSIBILITY has been stressed particularly in a new design of across-the-line starters just brought out by the Westinghouse Electric & Manufacturing Company. This is furnished in reversing and non-reversing types, both of which are very compact in design. Two slotted hexagonal screws hold the starter unit in place in a sheet steel cabinet. Thus the starter may be taken out as a unit by removing these two screws, making the inside of the cabinet accessible for attaching conduit bushings and pulling in leads.



Non-Reversing Type Starter that Can Be Removed as a Unit from the Case

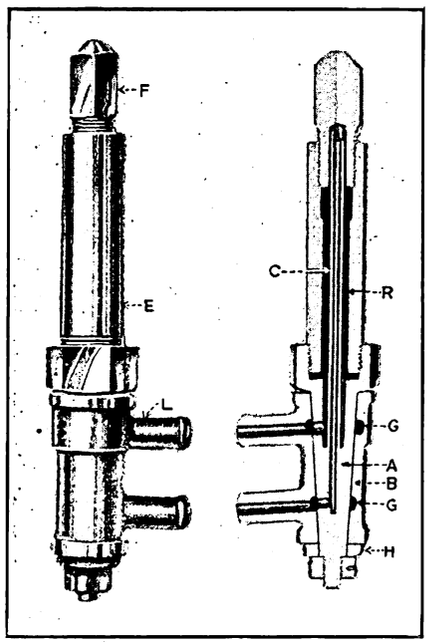
The starter consists of a three-pole contactor with electrical interlock. It is completely inclosed and is operated entirely from a push-button station. In addition to this safety feature, a floating armature type three-pole contactor is used that provides smooth and positive contact. Contactor tips are kept clean by the rolling and wiping action in closing.

Where operating conditions necessitate the protection of the starter against an accumulation of chips or other foreign matter, a door interlock may be furnished that makes it impossible to start the motor unless the cabinet door is closed.

The non-reversing starters, class 11-160, are for use on machine tools such as lathes, boring mills, grinders and cutters, and also for wood-working machinery. The reversing type, class 11-165, can be used advantageously on turret lathes and machine tools that require a reversing type of control.

Water-Cooled Electrode

WATER - COOLED electrodes have been placed on the market by the American Electric Fusion Corporation, Chicago, Ill. Referring to the letters in the illustration, *A-B* are brass castings internally machined to a taper and lapped in for a watertight joint. *C* is a brass tube taking the water from the entering duct *D* to within ¾ in. of the welding tip, where it drains down the passage *R* to the outlet *L*. *E* is the copper electrode tube fitted at the top end with *F*, which is the welding tip made from hard-drawn copper bar. The tip is held in the tube on a standard pipe thread to prevent leaking and is easily and quickly removed.

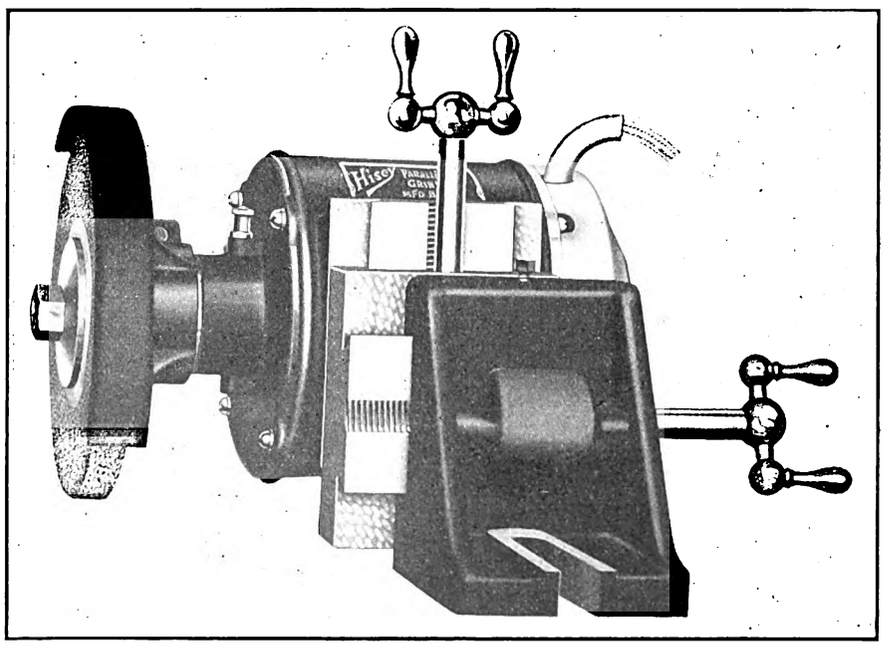


New Type Water-Cooled Electrode

Casting *B* has cored holes, *G*, which allows free circulation of water regardless of the position of the casting *A*, which is attached to the rubber hose connection of the circulating system. The nut *H* is provided to hold the casting *A* to *B* on the tapered joint.

Double Slide Angle Plate Grinder

PROVISIONS for supporting and adjusting heavy pieces of equipment which are to be ground so that accurate work will result is sometimes quite a problem for the shop men. In order to provide a grinder that can be adjusted both vertically and horizontally, the Hisey-Wolf Machine Company, Cincinnati, Ohio, has just brought out a double slide angle plate mounting for two of its standard machines. This consists of an angle plate support with double slides. The slide travels vertically 5½ in. and horizontally 4¾ in. Both slides operate independently, which permits quick and accurate adjustment to the work. Double slide grinders are furnished with wheels 8 in. x ¾ in. operated by ½-hp. motors. The no-load speeds of the two sizes are 3,000 and 3,400 r.p.m. respectively. Each of the above machines is supplied with the regular equipment, which consists of wheel guards, electric cable fitted with attaching plug, operating switch and grinding wheel of size as listed.



The Double Slide Mounting Permits of Accurate Adjustment of the Grinder to the Work

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The News of the Industry

Flood Closes Oil City Line for a Few Days

Facts are available about the effect of the flood of this week on the utilities in the Oil City-Franklin district of Pennsylvania. Early in the week the power station of the Citizens Light & Power Company had to be shut down and railway service suspended.

The primary cause of the flood was low water in the Allegheny River early in the season. This allowed the ice to collect in the gorges and the water backed up behind this ice dam. Finally, with the warm weather and rain which came the early part of this week, the ice blockade gave way. The lines of the Citizens Traction Company shut down when the power station in Oil City, from which power is received, was flooded. Through a high-tension tie connection with the Pennsylvania Public Service system it was possible for the company to continue its lighting and power service in Oil City, but with the rotaries under water it was impossible to supply power to the railway.

The stoppage of the rail lines was for a few days only, as emergency rotary equipment was put in operation and the railway resumed service on the morning of March 25.

The only other injury to the railway system was the loss of track laid on the Big Rock bridge, which was carried away by the flood.

It is expected that the machinery in the Oil City power station will be dried out and be ready to begin service again in a week or ten days.

Transit Topic Taken Up at Toledo

Early action on a settlement of street railway difficulties at Toledo, Ohio, is forecast in the correspondence which has been passing between Henry L. Doherty, head of the Toledo Traction, Light & Power Company, owning bonds of the Community Traction Company, and Mayor Fred J. Mery, who promised an adjustment of railway matters as the major issue in his campaign.

It is expected that the report of H. E. Riggs, who made an extensive survey of the Toledo situation last fall, will be the basis for final agreement. Professor Riggs suggested amendment of the Milner ordinance so as to centralize control of service and fares in the board of street railway control instead of the City Council, the abolition of the sinking fund plan of purchasing the lines, rerouting and physical changes, and development of a complete co-ordinated bus and railway system under co-operation of city, company and car riders.

Mr. Doherty has informed the city that there are points of differences between his engineers and Professor Riggs in their findings and has suggested conferences.

The city, through Mayor Mery, has asked Mr. Doherty twice for some specific answer as to what the differences are so that arrangements for negotiations may be undertaken. In a recent letter the Mayor informed Mr. Doherty that Professor Riggs was not now in the employ of the city and that he would have to know whether the Doherty objections to the Riggs plan were of an engineering, financial or legal nature before seeking help to negotiate the differences.

The latest letter, dispatched on March 22 by the Mayor, offers to turn over to the Doherty engineers all of the data of the Riggs survey with full permission for the Doherty group to discuss them with Professor Riggs without legal or financial obligation to the city.

While the system is now turning in a monthly deficit and there are no hopes of surplus except possibly in two or three peak winter months power revenue and bond retirements far offset the apparent losses.

Under present operation labor conditions are tranquil and the company has practically complete control of service and bus extensions.

Columbia the Gem of Transportation

Southern City Struggles with Several Systems on Its Streets—Street Cars, Buses and Jitneys Are Changing Ten-Cent Fares—Decrepit Jitneys Run Wild

SOME cities may be suffering from a shortage of transportation facilities—not so Columbia, capital of South Carolina. That city may be said to be suffering from a plethora of transportation. There are three separate, distinct and independent means of getting from one part of the city to another.

The street cars operate at a 5-cent fare under the zone system; the 29-passenger White buses operate at a 10-cent fare in sections of the city not served by the street car lines, and, lastly, the free lance jitneys, with a tattered flag fastened to a short staff attached to the radiator caps, run here, there and everywhere within the city limits for 10 cents.

Are any of the three clearing any money? That is a question not easy to answer. Prior to last December the street cars were charging 7 cents with 3 cents additional for transfers. The railway claimed to be losing money—some $7,000 to $8,000 a month. In an effort to enable the railway to continue to operate, many citizens feeling that a backward step would be taken were street car service to be suspended, the company was ordered to put into effect a "zone" system, with 5-cent fares in each zone. The "zone" system, instead of increasing revenues, seems to have reduced them, though it has not been in effect long enough to render a final verdict as to its revenue-earning possibilities. In November last, before the "zone" order became effective, the revenues of the railway were $12,330. The "zone" rule became operative about Dec. 16 and revenues for that month were $12,411, but it should be kept in mind that some of this revenue was derived when the 7-cent fare was the rule and the balance while the "zone" ruling was in order. In January, with the zone order in effect throughout the month, the revenue was $11,541, according to the vice-president of the company. In February the revenue was $11,486.

The new Carolina Transit Company, which has been operating buses in Columbia since early in the year, has been received cordially by the people.

"We have not been soliciting patronage so much as we have been endeavoring to establish schedules," the manager, Chester Hawkins, said when asked about the system and its patronage. "Right now I could not tell you when one or two of the buses will reach a certain point."

Despite the irregularity of certain lines, the buses are fairly well patronized and people are getting in the habit of waiting for them at street intersections just as they wait for street cars. An active bid for patronage, with a printed announcement of all schedules, will probably be offered soon by the company.

As to the jitneys, no man can say. They run practically without restriction; they ply back and forth on streets through which the street cars run, and are fairly well patronized. They carry patrons direct to their homes and to their places of business, having no established routes, and so have a certain advantage over both street cars and buses. Whether or not they make any money for their operators is a problem; some hold that many will have to stop running about the time it becomes necessary to buy a new set of tires all around, while some of the drivers themselves say they are able to make a living. Practically all of the jitneys are Fords, bought on the monthly payment plan.

Citizens generally seem to "take the first thing that comes along," be it street car, bus or jitney, provided the vehicle happens to be going in their direction.

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52 Miles of Pennsylvania at Philadelphia to Be Electrified

Preliminary steps have been taken in the program of the Pennsylvania Railroad for electrification at Philadelphia which entails the expenditure of $10,000,000 in addition to the cost of electrically equipped cars. The railroad's entire program is scheduled for completion in 1927.

The plans contemplate electrification of the lines between Philadelphia and Wilmington and West Chester via Media as the initial part of the railroad's general program of electrification of all suburban lines in the Philadelphia district.

In respect to mileage, the work now proposed to be carried out will constitute the most extensive project of the kind on the Pennsylvania Railroad. involving four tracks between Philadelphia and Wilmington with double and single track sections between Philadelphia and West Chester. The total number of miles of line electrified will be about 52 and the total number of miles of track will be about 150.

The distance to Wilmington is 27.1 miles and to West Chester 25.5. The total number of miles of line included in the present Paoli, Chestnut Hill and Fort Washington branch electrifications is about 38 with nearly 114 miles of track.

Plea Made for Drawbridge Closing

Request has been made to the Secretary of War by the chairman of the North Jersey Transit Commission, the presidents of the several electric and steam railroads operating in that district and the authorities of the various municipalities for changes in the regulations governing the use of the drawbridges over Newark Bay and the Hackensack and Passaic Rivers to permit the draws to remain closed during rush hours. The last public hearing in respect to the closing of these bridges for definite periods of the day was in 1918. At that time the War Department decided that conditions did not warrant any change in the rules. Since 1918 the situation has become increasingly serious. The time lost by commuters to New York because of drawbridge delays has been growing steadily.

Over some of these bridges there is a movement of 25 passenger trains an hour during the rush period. The delay of one train in the early part of the rush is very apt to be reflected upon all the trains arriving thereafter. From 12 to 15 per cent better service during the rush hours could be afforded if these bridges were to remain closed. The cost of stopping and starting trains is also a material item. The record shows that 4,564 trains were stopped during July, 1925, due to the opening of the bridges. There is a further economic loss brought about by the delays at the highway bridges over these waterways. Street cars of the Public Service Railway and buses use these highway bridges, and the time lost by their passengers must be added to the time lost by the railroad passengers.

A situation analogous to that in the North Jersey district prevailed in Boston in 1910. On account of the serious interruptions to suburban service, request for a change in the regulations was made to the Secretary of War by the Boston Chamber of Commerce and by the railroads. As a result of this application, closed periods were ordered for both the highway and railroad bridges over the Charles and Mystic Rivers and the Fort Point channel.

City Street Railway Department to Be Expanded

Colonel Sherrill, City Manager at Cincinnati, Ohio, and his aids are workings on plans to enlarge the scope of the duties of the office of Director of Street Railroads and Motor Buses, now headed by E. D. Gilman. Under the proposed change the department would become a bureau of public utilities, handling, in addition to electric railway and bus affairs, gas, electric and telephone service and other business. Colonel Sherrill said that he believed the Street Railroad Department when enlarged to take in other public utility matters would prove exceedingly useful to the city under the direction of Mr. Gilman.

Transit Baiter Defeated at Tacoma

Mayor A. V. Fawcett of Tacoma, Wash., candidate for re-election, has been defeated by Melvin G. Tennant in the recent city election. Mayor Fawceet has served Tacoma for four consecutive terms. During that time he has consistently fought the Tacoma Railway & Power Company, and during the past eighteen months has permitted a number of bus companies to operate jitneys in competition with the railway lines of the Tacoma Railway & Power Company. Mayor Fawcett recently advocated the purchase of the Tacoma street railway lines. The new Mayor promised to settle the transportation problem, subject to ratification of the voters at a general election. He has declared himself to be unalterably opposed to the purchase of the Tacoma Railway & Power Company's system by the city.

Complains of "Rubbernecks" in Washington

Residents of Kennedy Street, Washington, D. C., have protested to the Public Utilities Commission against "rubbernecks" of the Washington Rapid Transit Company who peep into bedroom windows. The complainants, through Mrs. J. G. Willis, their spokeswoman, at a hearing before the commission on March 10 stated that they were compelled to keep their bedroom curtains drawn. In addition to the inconvenience of drawing down the shades on the second floor front windows Mrs. Willis also informed the commission that the buses were dangerous and "imperil the lives of children every time they turn into Kennedy Street." Her protest came up in connection with consideration of the application of the Washington Rapid Transit Company to operate a bus line from Fourteenth and Kennedy Streets to Silver Spring and other points in nearby Maryland carrying intrastate as well as interstate passengers.

Higher Fares Sought in Bluefield

Application was made to the city of Bluefield, W. Va., by the Princeton Power Company for an increase in railway fares in that city. Embodied in the company's application were certain requests in which the company sought to have a new franchise drafted, and also to be relieved of the payment of $2,500 yearly for a seven-year period for the privilege of operating on the north side of East Princeton Avenue.

The city and the company were not in accord as to the three requests embodied in the company's application for increased fares. Neither did the city board approve changes suggested in the rate of fares. The Princeton Power Company officials subsequently modified their application, particularly with respect to the proposed increase in school tickets and transfers.

The proposed railway rates follow:

The present 6-cent cash fare to be made 8 cents.

The present twenty-ticket book to be raised from $1 to $1.20.

A four-ticket book or token to be sold for 25 cents.

The present school ticket book or 50 tickets to remain at $1.50 and not be increased to $2, as had been proposed.

One cent to be the transfer charge at the junction of Bland Street and Princeton Avenue, instead of 2 cents, as had been proposed.

It is understood the city approves the modified rates.

Four Years to Build Three Blocks of Subway in Heart of New York

The Fifth Avenue station of the Queensboro subway extension in New York City was placed in operation on March 22, marking the opening of service on the extension between Grand Central and Fifth Avenue and 42d Street. Construction on the extension was begun nearly four years ago. The full extension will run under 42d and 41st Streets to Eighth Avenue, connecting with the I. R. T. and B.-M. T. subways on the west side. The part of the extension on which service has been begun is only three blocks in length, but it is expected to be a great factor in relieving congestion of traffic at Grand Central and on the shuttle between Times Square and Grand Central. The extension is expected to be complete to Eighth Avenue in June.

Wage Agreement in Scranton

Trainmen, carhouse men and trackmen employed by the Scranton Railway, Scranton, Pa., voted on March 16 to accept a new agreement running from April 1, 1926, to April 1, 1927. By its terms operators of two-man cars will continue to receive 58, 61 and 64 cents an hour, the last figure being paid to men in the employ of the company more than one year. Operators of one-man cars get a small increase in their pay, due to the fact that they will be paid full time in returning from the carhouse after work to complete a report of the day's business. The rate of bus drivers remains at 69 cents an hour. The union sought to make the bus driver rate the same as for operators of one-man cars—72 cents an hour. Carhouse men and trackmen will benefit only by a change in working hours.

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Another Step Toward More Subways in New York City

The New York Senate on March 17 concurred with the Assembly in passing unanimously the Nicoll-Hofstadter concurrent resolution proposing an amendment to the Constitution which would permit New York City to increase its borowing power by $300,000,000, the money to be used in the construction of new subways. The resolution will have to be approved by the 1927 Legislature and can then be submitted to the voters at the next election.

Senator Nicoll and Assemblyman Hofstadter, said:

> New York City must have new subways. The present transit condition is intolerable and must be relieved. While there has been serious question as to the correct method of financing this new construction, the present city administration has insisted upon the bond issue as the only means by which it can accomplish its objects.
>
> The Legislature has co-operated to the fullest extent within its power to permit spbway construction in the manner determined upon by those accountable for that undertaking. But with power goes corresponding responsibility, and the people of New York City have the right to look to the city administration to employ these funds economically and for the maximum benefits possible.

New Method of Presentation for Tennessee Utility News

With the issue of the *Tennessee Utility News* for March, 1926, the Tennessee Public Service Association, composed of the utility companies of the state, is presenting to its readers and the public generally a publication in an entirely new form.

The *Tennessee Utility News*, a sixteen-page booklet, is to be issued once each month. It is scheduled to come off the press about the fifteenth of the month. It will be non-partisan and non-political. Its purpose will be to enlist the friendly interest and co-operation of the public, public utility customers, investors and employees, so that a better understanding of mutual problems may be reached. *Utility News* will be devoted solely to information about the utility industry and particularly that portion within the state.

Wage Increase Ahead for San Francisco Municipal Men

Trainmen of the Municipal Railway in San Francisco, Cal., may get a larger increase in pay than they have requested. They are at present receiving $5.40 a day for eight hours and have asked for a raise of 60 cents, bringing their wage up to $6 a day.

If a new rezoning and standardization plan of wages of municipal employees goes through as now outlined, the platform men will be placed in Zone 4 and will draw a monthly wage of from $160 to $175, or at the rate of from $6.21 to $7 a day.

This plan is now practically ready for presentation to the Civil Service Commission. The salary question of city railway employees has been agitated for more than a year. It has been made plain to the men that until some reorganization plan has been perfected and adopted they will have to wait for their increase.

The last monthly report of the railway showed a net income of $70,734 prior to federal income tax deduction and for two months ended Feb. 28 net of $119,387. The gross income for February was $152,767 and for the two months $283,529.

Two-Cent Wage Increase in Louisville

An increase of 2 cents an hour in pay of all platform men of the Louisville Railway, Louisville, Ky., was announced on March 17. The increase, retroactive from Feb. 1, 1926, affects about 1,500 men, and, according to President James P. Barnes, increases the annual payroll $100,000 a year. This increase brings the wage of platform men up to 47 cents an hour on two-man cars; and to 50 cents an hour to operators of one-man cars.

No formal request was made for an increase, but the matter has been under consideration for some time. The agreement covering wages was reached at a recent meeting of the general committee of the co-operative association of the Louisville Railway. The new wage does not equal the peak wage of 48 cents in effect following the war, but is higher than the 45-cent rate of the War Labor Board period.

Shortly after Mr. Barnes became president of the company in 1921, the wage was advanced to 48 cents, over a period of six months, then reduced to 43 cents, but three months later was increased to 45 cents, and remained at that figure. Operators of one-man cars have for some years received 3 cents an hour more than operators of two-man cars.

Wants Seven Cents in Huntington

The Ohio Valley Electric Railway, Huntington, W. Va., in the opinion of its executives, is entitled to a 7-cent fare, and is restrained from asking for a fare increase before the State Public Service Commission only by a fear that a higher fare might produce a smaller revenue in the long run than the present 6-cent fare. George I. Neal, counsel for the street railway, outlined the attitude of the company toward a demand for fare zone extension and service improvements. A word picture of the railway as a public service corporation facing almost certain poverty unless relief in the form of increased revenue is soon forthcoming was drawn by Mr. Neal as a rejoinder to demands launched at the city hall by Commissioner Yeich for fare zone extension. He said it might become necessary for the company to ask the right to make an additional charge for transfers, or resort to other expedients.

City Attorney P. P. Gibson was notified recently by the City Commission of Huntington to investigate the "right of the Ohio Valley Electric Railway to maintain fare zones within the corporate limits of the city and to prepare an application to the Public Service Commission requesting restoration of a 5-cent fare with transfer privileges on all of the city lines of the railway."

Guelph Rejects Plan of Purchase

A proposal to issue $300,000 in 30-year 5 per cent debentures to purchase the Guelph City District Railway, Toronto, Ont., from the Hydro-Electric Power Commission was flatly rejected by the ratepayers recently, when a by-law for this purpose was defeated, 868 to 295. The outcome of the vote was a complete reversal of the January municipal election, the citizens on the first occasion favoring a plebiscite for management of the railway under a civic commission by a majority of 856.

The Guelph system has been operated for the past four years by the Hydro-Electric Railways, which is controlled and operated by the Hydro-Electric Power Commission of Ontario. The municipal election was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 16, page 127.

Omaha Report Adopted

The Omaha City Council in committee of the whole on March 9 adopted the form of consent as reported by its street railway committee and recommended it for passage. Later the Council made some minor amendments to the proposed grant to be made to the Omaha & Council Bluffs Street Railway. When it is finally adopted the grant will be published in full in the daily newspapers every day for 30 days prior to the special election.

Northampton Property Will Run Electrified Branch

The Northampton Street Railway, Northampton, Mass., has entered into negotiations with the Boston & Maine Railroad on proposed electrification of the Mount Tom branch, which the street railway proposes to take over and operate. The subject was first taken up last fall, but the street railway made its official proposal only a few weeks ago, and is now awaiting a reply from the railroad. The Northampton company desires to electrify the road, and will then abandon the East Street trolley line and also the Clark Street line as far as Cottage Street, both in the town of Easthampton.

Two-Cent Wage Increase in Salt Lake City

An increase in wages to motormen, conductors, carhouse men, shopmen and trackmen which amounts to about 2 cents an hour for each of these employees has been granted by the Utah Light & Traction Company, Salt Lake City, Utah, effective April 1.

When the last wage agreement was entered into between the employees and the traction company the "cost of living index" based on the prices prevailing at the time was 168.8, with the year 1913 taken as a normal year, with an index of 100. The wage contract provided for an arbitrary increase or decrease of wages as the cost of living index went up or down. The basis was to be the official government statistics as published in the Monthly Labor Review, issued by the United States Department of Labor.

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City Club at Chicago Makes Franchise Suggestions

Transportation conditions regarded to be desirable have been recommended to the City Club of Chicago by a special committee of that organization authorized to study the subject so that the club might go on record with respect to its attitude on the subject of the surface railway franchises soon to expire. The committee suggests:

1. Service is the fundamental requirement—the ability to travel from one point to another with safety, comfort and speed.
2. Unification of bus, street car and rapid transit lines. Ultimate unification of ownership, if desirable.
3. Conditional terminable permits provided that:
(a) The city shall be given actual financial as well as legal power to purchase.
(b) All rights to the use of the streets shall be terminable by the city for non-use or for misuse.
(c) The city shall have full rights to control service, extensions, additions and improvements.
(d) The state, through its regulatory body, shall have the right to control the issue of securities.
(e) The permit shall provide for the methods of: (1) valuation; (2) determination of fares; (3) accounting; (4) depreciation and obsolescence; (5) termination for non-use or misuse.

Petition for Ferry Denied

After long deliberation the California Railroad Commission has denied the Golden Gate Ferry Company a rehearing on its application to institute ferry service between Berkeley and San Francisco for the transportation of pedestrians, automobiles and their occupants and freight. A former application was denied Jan. 25 and a petition for a rehearing was filed on Feb. 2.

The commission declared the company had failed to prove the service was essential to the convenience of pedestrians. It took the attitude that if the ferry company should amend its petition to eliminate pedestrians a new hearing might be granted.

Installation of the new ferry was opposed by the Key System Transit Company and the Southern Pacific, both of which were recently awarded higher transbay rates by the Commission.

Suggestions Received on Improvements in Pittsburgh

The Pittsburgh Railways, Pittsburgh, Pa., has received about 5,000 replies to its suggestion blanks soliciting hints on how to improve service and add to the comfort of the riders. About 90 per cent of the replies offered suggestions on operating and equipment subjects. They embrace special fares for school children, express service, reduction in the price of the weekly pass from $1.50 to $1.25, and offered remedies for the solution of the loading and unloading problem in the downtown district.

Action Against Jitneys in Louisville

Merchants on Market Street, Louisville, Ky., have adopted resolutions calling upon the city to regulate jitney operations in the interest of the safety of the public and eliminate rowdy tactics employed by operators. Practically all of the Louisville jitneys operate on Market Street. These operators block traffic, take on passengers in the middle of the street, instead of at the curbing, interfere with trucks serving the merchants, turn in the middle of the street and are noisy, rough and objectionable in many other ways.

Waukesha-Milwaukee Agreement Accepted

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has accepted the franchise agreement offered by the city authorizing the construction and operation of the cut-off interurban line to Waukesha. This step marks the end of a controversy between the company and the city over the right of the company to build this line without first obtaining a franchise from the city. The company contended that the certificate of convenience issued by the Railroad Commission was sufficient to warrant it in going ahead with the project, a road being built over a private right-of-way. Under the terms of the franchise the company must reimburse the city for any additional cost above that normally expended by the city on an ordinary thoroughfare for improvements. The approval of the Milwaukee-Waukesha franchise was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 20.

Wage Demands of New York State Men Undecided

Employees of the New York State Railways in Rochester, Utica and Syracuse have been unable to agree on demands for a new wage and working agreement to take effect on May 1. Following conferences of union officials in Syracuse, it was reported that the deadlock is caused by the request of Rochester employees for the right to petition for a wage increase independently of the men in the two other cities.

The Rochester union voted in December to ballot on contracts separately. This action was due to the Rochester workers being overruled by a heavy vote in the balloting of last spring when Utica and Syracuse men accepted a company offer to which Rochester was opposed.

The right of Rochester workers to act independently has been questioned by Syracuse and Utica unions. The international officers will have to decide the question, it is believed.

Further conferences are to be held in an endeavor to arrive at an agreement as to the demands to be submitted to James F. Hamilton, president of the New York State Railways.

That the men will ask for a wage increase is certain. The amount of the raise to be sought hinges on the negotiations pending between the unions of the three cities.

Rochester employees believe that a 1-cent fare increase put into effect in their city the first of the year will add weight to their plea for a higher wage. Applications of the company for an advance in fare from 7 to 10 cents in Syracuse and Utica will probably not be acted upon by the State Public Service Commission before the present working contract expires.

News Notes

Sunday Pass System Abolished.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has abolished the system of selling Sunday passes because the demand for such passes fell off. The tickets were sold for 25 cents and could be used all day Sunday on any division.

Free Transport Before City Council.—Whether policemen and firemen in Seattle, Wash., who now ride free on the Seattle Municipal Railway lines in the city, will be required to pay their fares when off duty is a question on which the city utilities committee is divided. Two reports, one for and the other against the ordinance making the proposed change from free rides, will go to the City Council.

Paving Relief Voted in New Jersey.—The New Jersey House after an unsuccessful attempt earlier passed on March 25 a Senate bill to relieve electric railways from paving obligations. As amended by the House the utility companies would be required only to repair damage done to paving removed in connection with work done by them to their own tracks. The Senate recently passed the bill after also defeating it several weeks ago.

Operation for a Trial Period.—The Wheeling Traction Company has agreed to operate the hillside line on 90 days trial, with the option of returning it to the city of Wheeling at the end of that time. The Mozart Park (hillside) line was taken over by the city when the City Traction Company refused to continue operation at the old fares.

Purchases Right-of-Way.—The sum of $9,500 has been agreed upon by the Northampton County Commissioners as the price to be paid for the purchase of the right-of-way of the Bangor & Portland Transit Company between East Bangor, Pa., and Portland. The purchase of the right-of-way by the county will make it possible to develop a new road between the two towns.

Opposes One-Man Cars.—The City Council of Niagara Falls, Ont., is opposed to the operation of the one-man cars which the Canadian National Railway has announced will be put in operation on the local lines in April. The company says the cars are necessary, due to financial loss in operation of the lines.

Trainmen in Memphis Rewarded.—Conductors and motormen of the Memphis Street Railway, Memphis, Tenn., earned for themselves the sum of $8,416 in extra pay during the past three months, according to figures recently made public. The amount will be distributed among the men on March 22, each receiving a proportion based upon the number of hours worked within the period. For the year ended Feb. 28 the men earned for themselves extra compensation totaling $35,320. During the corresponding twelve months of the year before the men had earned $35,071. The plan was adopted by the Memphis Street Railway in 1923.

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Recent Bus Developments

An Overambitious Project

Events in the History of the Indianapolis Bus Terminal and the Red Ball Lines

"For Rent" is in effect the sign that has been hung on the "world's largest bus terminal," erected in Indianapolis at a cost of $250,000 for the accommodation of intercity buses. So the end has been marked of an experiment in interurban transportation which, less than a year ago, attracted attention all over the country. The terminal was opened with a public celebration on May 19, 1925. It accommodated 28 different bus lines operated in competition with the electric railways. When the doors were closed there were only three independent lines left in competition with the electric lines. The others had either been sold to the electric railways or abandoned.

One of the systems using the station was the Red Ball Lines. As noted previously in the ELECTRIC RAILWAY JOURNAL it went into the hands of a receiver last December and has since passed to the ownership of the Terre Haute, Indianapolis & Eastern Traction Company and the Union Traction Company. The receiver of the company was Fred I. Jones. He lost no time in finding out what the matter was. The fares had been too low. More about that later. It is the philosophy expounded by the receiver after his study of the matter that is of interest. Mr. Jones said:

> It is apparent, that the operation of buses must be co-ordinated with existent steam and electric forms of transportation. This is particularly true in Indiana, which is covered by such a network of steam and interurban railways, serving the population fairly satisfactorily. The buses find it impossible to stand alone, but are logically indispensable in rounding out a complete and unified transportation system.

In giving the current news on the situation the risk is run of repeating some things that have been said before. Still it is better to do that than to leave a hiatus in the sequence of recent events.

At the time the receiver was appointed it was evident that while business seemed to be satisfactory, the receipts were not sufficient to take care of operating expenses and depreciation. These receipts fell far short of providing in addition any return on the investment. As one of his first acts the receiver petitioned the Public Service Commission for an increase in fares. This petition was filed and heard and an increase granted. The increase, however, did not prove satisfactory from an operating standpoint, and the receipts were not sufficient to meet operating expenses and depreciation.

In consequence the receiver faced two alternatives. One was to continue the lines at an operating loss until the assets in the hands of the receiver were dissipated, and the other was to sell the certificates and rights to operate to the traction companies. It is apparent to Mr. Jones that the first course would result in the dissipation of all funds so that the creditors of the Indiana Red Ball lines would receive practically no dividend. On the other hand sale to the traction companies promised to bring additional money into the trust so that the creditors will receive some payment on their claims. The latter, therefore, seemed to Mr. Jones to be the proper course to follow. This he did.

But to get back to the terminal. When it was opened most of the bus lines were being operated on a basic fare of less than 2 cents a mile. The lines that survived were the ones whose operators had sought and received permission to increase fares to the basic 3 cents a mile, which is the rate charged by the railways.

From an annex to the electric railway terminal in Indianapolis buses are now alternating with interurban trains, paralleling their rights-of-way but not competing, for the rates are practically the same and the running time is not materially different.

The co-ordination of buses with interurban lines involves the establishment of new fare schedules on almost all lines, including those whose owners have recently received permission to increase rates to the level of the electric railway rates.

Brooklyn Wants 77 Miles of Bus Routes

Railways Prepared to Install 20 Routes on Service-at-Cost Basis Starting at 5 Cents—Excellent Statement of Place of Bus in Transportation Scheme

THE Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad, operating practically all the surface lines in Brooklyn, applied on March 20 to the Board of Estimate for a franchise to operate 21 bus routes, of a total length of about 77 miles, in that borough.

The application was made by the C. I. & G. Bus Corporation, of which William S. Menden, president of the B.-M. T., is president. This company offered to start operation of all the proposed lines at a 5-cent fare, except the Ocean Parkway-Lafayette Avenue line, for which a 10-cent fare was asked, on condition that the franchise contract should contain a provision for cost of service and enable adjustments by which the rate of fare should from time to time be fixed to cover this cost. The company offers the city a return of 3 per cent of its gross receipts.

The bus corporation offered free transfer privileges between all bus lines, except the Rockaway Ferry line and the Ocean-Parkway-Lafayette Avenue line. It also offered free transfers to and from surface cars at 21 points and undertook to obtain the consent of all the surface railroads in Brooklyn to the establishment of such bus routes as might be competitive.

In regard to the general effect of bus operation, abandonment of surface lines, fare and terms of franchise and compensation to the city, the application read in part:

> Bus operations can be mainly of benefit only as feeder lines for outlying sections and for crosstown service where existing facilities do not cover the territory adequately. Buses cannot be relied on exclusively to care for the traffic in business districts or other congested areas. The surface systems are vital and essential parts of the transit facilities of Brooklyn, whatever may be the situation elsewhere. To confirm this, it is sufficient to point out that in the year ended June 30, 1925, the surface lines of the B.-M. T. and of the Brooklyn City Railroad carried 512,492,371 passengers and that the B.-M. T. rapid transit lines in Brooklyn, Manhattan and Queens carried 591,983,639 passengers. In other words, the surface lines, carrying approximately 50 per cent of the total of the borough, are so essential that they must remain to do their full share of the transit requirements of the borough. Both surface lines and rapid transit lines, however, can be supplemented by bus lines as herein indicated.

According to the company a rate of fare which does not cover the cost of service is not in the interest of the public because the grantee cannot, under such circumstances, render the service the public demands.

The company holds to the opinion that the best service to the public can be rendered under franchises granted for a reasonably long period. The bus corporation suggests 25 years, with the right in the city to terminate at any time upon one year's notice, upon payment of the unamortized investment and with provisions whereby bus franchises may be shifted to other routes whenever the completion of rapid transit facilities or other conditions justify.

The bus corporation is assured ample capital to equip and operate such borough-wide system of bus routes with the most modern and efficient equipment.

In short, the franchise is intended to cover bus operation in Brooklyn, based on co-ordinating buses with the existing transportation lines. The application proposes to substitute buses for street cars only in the cases of three little shuttle lines which operate in the outlying districts and none of which has ever earned operating expenses.

Howe Buffalo Proposal Rejected

By a vote of three to two, the City Council of Buffalo, N. Y., has rejected the application of Ernest M. Howe, Detroit, and the American National Omnibus Corporation for permission to operate 5-cent gas-electric buses over 71.5 miles of streets on thirteen routes under a twenty-year franchise. The Council felt that in view of the failure of Mr. Howe and his associates to perfect the financing plans of the new company no more consideration should be given to his proposals, which have delayed the solution of Buffalo's trans-

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portation problem for almost six months.

Consideration now will be given by the Buffalo City Council to the proposals of the International Railway and its subsidiary, the International Bus Corporation, for a unified traction-bus system covering all parts of the city. Three members of the City Council have taken a favorable stand toward the proposals of the International, which already has the support of the Buffalo Chamber of Commerce, Federation of Business Men's Associations and other organizations of the city.

Adoption of Uniform Franchise in New York Expected by April 1

Acting Mayor Joseph V. McKee of New York City, chairman of Mayor Walker's transit conference which has been considering bus routes and franchises, announced on March 24 that he expected the way to be cleared within two weeks for the Board of Estimate to prepare for the awarding of bus franchises throughout the city, according to the tentative routes already laid out. He said:

> There will be virtually a uniform form of franchise for the entire city. It will stipulate the terms and conditions under which the various companies may proceed to operate bus lines. We have not yet reached any definite conclusion upon a uniform rate of fare. In come instances we may have to establish a zone system with fares in excess of 5 cents for long-distance rides. But we are bargaining with the several bidders with the sole purpose of getting for the city the best possible terms and the most efficient and responsible service.

The discussion on March 24 was of a general nature, but, according to Mr. McKee, the opinions expressed were so unanimous that he felt there was no doubt that the few remaining minor differences would be ironed out in a final meeting of the special committee set for March 27.

It is believed, therefore, that the committee on March 31 will be in position to report to Mayor Walker and his associates of the Board of Estimate its recommendations concerning franchise terms, as well as routes.

Proposal Includes Both Bus and Rapid Transit for Cincinnati

Suggestions covering proposed use of the bus in several communities and a forecast of the utilization of the rapid transit system in the near future are embodied in a proposal submitted to the city administration of Cincinnati, Ohio, by Walter A. Draper, president of the Cincinnati Street Railway. The opportunity is presented in alternative plans for transportation on that portion of Ludlow Avenue to be improved. It concerns the Clifton-Ludlow line in whole or in part, according to the plans adopted. The Clifton-Ludlow question is linked with the larger question of the rapid transit problem because there is a station of the system at Ludlow Avenue. One of the alternative plans provides for a bus service from Clifton to and from this station where passengers would be transferred from buses to cars of the rapid transit system.

On the question of the rapid transit line Mr. Draper referred to the company's report to the stockholders at the annual meeting held on Jan. 27. Herein it was stated that the officials would endeavor to present the point from which they must view the possibility of its operation, viz., how the rapid transit line could be operated so that the resultant transportation system could be made to provide adequate and dependable transportation facilities for the metropolitan area of Cincinnati at a reasonable rate of fare, yet one that would make the project self-sustaining.

Opposition Develops to Bill to Regulate Interstate Bus Traffic

Considerable opposition developed at the hearings before the Senate committee on interstate and foreign commerce at Washington on March 22-25 on the part of motor truck operators and others not only to the Cummins bill but to any form of regulation at this time. The Minnesota regulatory commission opposed relinquishing control over bus lines that used the state highways on the grounds that only a small part of the routes operated extended beyond the state boundaries and that if the present bill was enacted the commission would lose control of its power of regulation over strictly intrastate lines.

The bus men favored regulation as an abstract theory, but they were not in favor of the bill as introduced. The railroads, both steam and electric, favored the bill, as did the National Association of Railroad and Utilities Commissioners, although in conference prior to the opening of the hearing they conceded a part of the amendments desired by the bus operators represented by the legislative committee of the Bus Division of the American Automobile Association.

The constitutionality of delegating federal authority to state regulatory commissions was questioned, as was the fact that contract carriers and private facilities did not come under the provisions of the bill. Witnesses also protested that ostensible competitors were attempting to prevent the further development of the motor carrier industry.

The truckmen called attention to the lack of power of the state regulatory bodies to function under the bill even if passed until enabling legislation had been enacted. In the meantime all the work of regulation would be thrown upon the Interstate Commerce Commission, now overburdened.

Members of the committee on interstate and foreign commerce were not in agreement on the necessity and advisability of such regulation, if the questions asked witnesses are any criterion.

Will Experiment with Buses on Branch Lines.—President Wesley W. Sargent of the Fitchburg & Leominster Street Railway, Fitchburg, Mass., announced recently that the company was considering replacing trolleys with buses on the short branch lines. The railway now runs buses in conjunction with the car service on the main lines, but desires to experiment with the buses on the short branch lines.

Safe Drivers Rewarded.—Drivers of the Brown bus line of the Twin City Rapid Transit Company, Minneapolis, Minn., who have served more than a year without accident have been presented with a careful driving certificate and an arm insignia marked "Safe Driver" in gold letters on black background to be worn on the right arm. Two of the men had a record of three years. Twelve drivers were given the reward of merit.

Interstate Line Ordered Not to Do Intrastate Business.—The Public Utility Commission of New Jersey on March 20 granted an order sought by the Erie Railroad and the Public Service Railway directing the Fontanella Bus Company, operating a Paterson-New York line, to stop doing an intra-State business in New Jersey.

Railways Oppose Bus Applications.—Attorneys for the Rochester & Eastern Railway and the Ontario Motor Bus Lines, Inc., subsidiaries of the New York Central Railroad, at a hearing held in Rochester, N. Y., on March 12 opposed an application for an operating certificate for a bus line from Canandaigua to Geneva, N. Y., by way of Hopewell. The hearing was conducted by Public Service Commissioner Charles Van Voorhis. The railways contended that the proposed bus line would parallel their routes, which, they claim, give adequate service to the territory.

Ohio Company Secures Control of Bus Company.—The Lorain-Amherst-South Amherst bus line has been obtained by the Southwestern Bus Company of Cleveland, incorporated in Columbus on March 18. Its backers are officers or persons interested in the Cleveland, Southwestern Railway & Light Company—F. H. Wilson, president, who is head of the Southwestern Railway; C. J. Mayers, secretary and treasurer; Gardner Abbott, attorney; J. A. Nestor, and E. L. Hukill. The Lorain-South Amherst bus ran parallel to the railway's tracks through a "section that could support one line but not two," according to President Wilson.

Would Replace Cars with Buses.—The East St. Louis & Suburban Railway has applied to the City Council of Belleville, Ill., for permission to abandon its two city railway divisions and replace them with bus service. Interurban service would not be changed under the plan. Two street cars now operate on the Illinois Street division and one car on the Louisville & Nashville depot division. The bus service will be extended into additional territory if the application is granted.

Seeks New Bus Certificate.—The Los Angeles Railway has applied to the California Railroad Commission for a certificate to operate motor coach service along Manchester Avenue in the city of Inglewood to Manchester Avenue and Compton Avenue in the county of Los Angeles.

New Service Arranged.—Faster and more direct railway-bus passenger service will be provided by the Wisconsin Motor Bus Lines to Elkhorn, Delevan and Beloit. There will be through bus line service from Racine to Beloit connecting at Burlington with interurban trains of the Milwaukee Electric Railway & Light Company. Scheduled running time between Milwaukee and Beloit will be cut 40 minutes under this arrangement.

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Financial and Corporate

270-Mile Texas Road Reports

Earnings of Texas Electric Railway, Operating Interurban and City Systems, Hold Up Well

Gross earnings of the Texas Electric Railway, Dallas, Tex., from operation for the year ended Dec. 31, 1925, were $2,362,114. The operating expenses and taxes for the year totaled $1,524,615. Regular dividends on first and second preferred stocks were paid at the rate of 7 per cent per annum. The dividends upon common stock were paid at the rate of 1 per cent a quarter for the first half of the year. During the year the company spent $389,915 on the physical property, or $35,598 in excess of the mortgage requirement. Since 1917 it has spent for these purposes $4,139,892, or $692,926 in excess of what its mortgage required it to spend. The management has set aside, with approval of the directors, an additional sum of $100,000 from surplus into renewal and replacement reserve, to be used as found necessary and advisable for further maintenance and upbuilding of the property.

Since its organization the company has constantly followed the policy of reinvesting its surplus earnings and reserves in the improvement of the property. During this time it has so invested $1,974,384. Of this amount, $878,775 represents fundable investments, against which new securities have not been sold. In addition, it has expended approximately $275,000 in terminal properties in Dallas and Waco and improvements thereon, which will become fundable upon the payment of the balance due upon the purchase price thereof. There was expended during the year for additions and improvements to the property the sum of $142,169.

During 1925 the passenger service was substantially improved. A large quantity of ballast was distributed and tracks otherwise bettered. Additional substations were provided, with great advantage to power distribution. The train schedules upon all divisions were shortened. During the year street car service to certain sections of both Denison and Sherman was discontinued and bus service substituted therefor. These abandoned lines were largely upon unpaved streets and the tracks have been removed therefrom.

In the estimate of receipts and expenditures for 1926 submitted by Mr. Martin, vice-president and general manager, a special effort was made to be conservative. Under this estimate the income will be sufficient to provide for all operating expenses, taxes, interest, dividends upon preferred stocks, the transfer of the usual $100,000 to renewal and replacement reserve and a substantial addition to surplus. The drought of 1925 has been broken by abundant winter rains. This greatly improves the outlook in this section of Texas and in the words of the management it justifies the hope that the actual earnings for the year will exceed this advance estimate.

On Jan. 1, 1925, bus competition with the company's lines existed only between Hillsboro and Waco, a distance of 34 miles. During March, 1925, bus service was installed between Dallas and McKinney, a distance of 32 miles. Just at the close of the year bus line service was established between Dallas and Waco by way of Alvarado to Hillsboro, and paralleling the line between Hillsboro and Waco. A careful check made from time to time of these bus lines discloses that their average gross earnings fall far short of actual operating and maintenance costs, and it is not believed that this competition will be permanent.

INCOME ACCOUNT OF TEXAS ELECTRIC RAILWAY FOR THE YEAR ENDED DEC. 31, 1925, AND SUMMARY OF SURPLUS ACCOUNT

INCOME ACCOUNT

Gross earnings from operations		$2,362,114
Operating expenses and taxes		1,524,615
Net earnings from operations		$837,498
Add: Interest on bank balances, etc.		586
Total net earnings before depreciation		$838,084
Interest deductions		426,321
Surplus net income before depreciation		$411,763

SUMMARY OF SURPLUS ACCOUNT

Balance January 1, 1925, per previous report		$1,444,861
Add: Surplus net income for the year ended Dec. 31, 1925, as above	$411,763	
Sundry Surplus Credits:		
Refund of 1921 and 1922 federal taxes with interest, less expenses in connection therewith	31,645	
Profit on sale of real estate	22,475	465,884
		$1,910,745
Deduct: Provision for renewals and replacements	$100,000	
Dividends Declared:		
On first preferred stock	$119,635	
On second preferred stock	210,000	
On common stock	120,000	
Sundry Surplus Charges:		
Additional provision for 1924 federal taxes	$2,500	
Loss on investments written down to nominal values	3,996	556,131
Surplus balance, Dec. 31, 1925, per balance sheet		$1,354,614

The cities of Denison, Sherman, McKinney and Waxahachie have passed ordinances to regulate and restrict the operation of buses through these municipalities. The feeling of the management is that while these municipal ordinances are helpful, they do not fully meet the situation. This can be most effectively done by state legislation.

As usual, most of the accident of consequence resulted from collisions with automobiles at highway crossings. With the enforcement of the law against excessive speed practically suspended, and with no law requiring vehicles to stop or reduce speed before going over railroad crossings, autos continue to race across places of danger in flagrant disregard of all rules of safety. Jack Beall, president of the interurban, says that in spite of all the "Safety First" crusades, in spite of all the glaring newspaper headlines telling of the grisly harvest of death upon the highways, and in spite of the knowledge that more people were killed by automobiles last year in the United States than now live in some of the populous counties of Texas, and more people injured than now live in the city of Dallas, this tournament with death goes on. He says that something should be done, and done at the earliest possible time, to stop this destructive waste of human life and human efficiency. It should be done not to save the expense of such accidents to the railroad companies, but for the higher and better purpose of protecting those who will become the victims of these road tragedies.

Rochester Appraisal Suit Set for April 1

Trial of the suit of the city of Rochester for a revaluation of the Rochester lines of the New York State Railways is set for April 1 in the Supreme Court, Justice Adolph J. Rodenbeck presiding. It had previously been scheduled for March 3. The valuation as fixed by the service-at-cost contract under which the lines are operated is $19,216,000. The traction company contends that the city forfeited its right to obtain a review because it failed to oppose the appraisal figures when the matter came before the Public Service Commission. The present valuation was fixed by three appraisers in 1921. The city maintains that the valuation is too high.

Suit to Establish Status of St. Louis 4s

Milton Von Boston has carried to the United States Supreme Court his fight to have the $30,000,000 of general 4s of the United Railways, St. Louis, Mo., declared either due and payable or in default so that foreclosure of the mortgage securing the bonds may be had. He wants a writ of certiorari to review the finding of the United States Circuit Court of Appeals. The District Court dismissed Von Boston's petition and the Circuit Court of Appeals sustained that ruling, holding that no defaults existed under the general 4s mortgage. The reorganization plans for the United Railways contemplate leaving the $30,000,000 mortgage undisturbed. Should the high court decide to review the case it will not delay the reorganization, attorneys declare.

New Company Takes Over Properties at Lincoln, Neb.

Unification of all heat and electric properties of the Lincoln Traction Company and all gas and electric properties of the Lincoln Gas & Electric Light Company, Lincoln, Neb., into a new corporation has been authorized by an order of the Nebraska Railway Commission. The new corporation will be known as the Lincoln Public Service Company. Under the terms of the order the Lincoln Gas & Electric Light

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Company will cease to do business, but the Lincoln Traction Company will continue to operate the traction system.

The operating officials of the new company are: B. J. Denman, president; C. N. Chubb, vice-president; O. J. Shaw, vice-president and general manager, and O. R. Mallat, assistant secretary.

The budget for the year for these properties is $1,352,157. A substantial portion of this amount is to be spent on railway construction. Traffic experts connected with the United Light & Railways Company, by which the Lincoln properties are controlled, have been making a thorough study of the Lincoln street railway situation for many weeks to the end that greater economy of operation and greater efficiency and better service may be achieved.

New Financial Control for California Road

Control of the Central California Traction Company, Stockton, Cal., by either the Southern Pacific or the Santa Fé would not be in the public interest. This is the opinion of Ralph R. Holster, an examiner for the Interstate Commerce Commission. In a report to the commission he recommends that the proceeding be held open to afford an opportunity to formulate a plan whereby the traction company can be taken over jointly by the two railroads mentioned and the Western Pacific. The Central California Company operates 70 miles of overhead trolley and third rail line in service akin to that performed by the steam railroads in the same territory.

Another Customer-Ownership Campaign in New Jersey

The Public Service Corporation of New Jersey plans another campaign of stock selling through its employees on April 1, when 50,000 shares of 6 per cent cumulative preferred will be offered at $100 a share and accrued dividend, either for cash or on terms of $10 down and $10 a share per month, the amount of accrued dividend to be included in the last installment paid. Interest at the rate of 6 per cent annually will be paid on such installments, adjustments being made when the stock is delivered.

Net Income on New York State Railways Lower

The net income of the New York State Railways, Rochester, N. Y., for the year ended Dec. 31, 1925, was $760,139, against $1,036,407 for the year ended Dec. 31, 1924. The comparative statement for the years 1925 and 1924 are shown in the accompanying statement.

SUMMARY OF OPERATIONS OF NEW YORK STATE RAILWAYS—YEARS ENDED DEC. 31

	1925		1924	
Railway operating revenues		$10,027,906		$10,358,198
Railway operating expenses (including depreciation)		7,199,139		7,257,744
Net revenue railway operations		$2,828,766		$3,100,453
Net revenue auxiliary operations		1,247		665
Net operating revenue		$2,830,014		$3,101,119
Taxes assignable to railway operations		695,146		711,305
Operating income		$2,134,868		$2,389,814
Non-operating income		132,942		125,071
Gross income		$2,267,810		$2,514,886
Deductions from gross income		1,507,671		1,478,478
Net income		$760,138		$1,036,407
Sinking fund appropriations		32,664		34,636
Dividends preferred stock (see note)	(5%)	193,125	(5%)	193,125
Earned on common stock	(2.68%)	$534,349	(4.05%)	$808,645

Note—2½ per cent was paid in 1925.

Foreclosure of Hartford & Springfield Set for April 27

An order has been issued to foreclose the property of the Hartford & Springfield Street Railway, Warehouse Point, Conn. The foreclosure is based on default of the payment of $600,000 of bonds standing against the property. In addition $260,000 in interest is in default.

Lucius F. Robinson, who presented the case, and Judge Christopher L. Avery, who signed the foreclosure papers, were bitter in their criticism of the present condition, under which interstate bus companies are permitted to operate in the State of Connecticut without being subject to the control of the Public Utilities Commission. Judge Avery said the condition was intolerable.

Mr. Robinson said that six months ago the future of the Hartford & Springfield Street Railway seemed to be most promising, but that wholesale competition in interstate service has been a severe blow.

Present plans are to sell the property on April 27 at public auction. Arthus Perkins, Hartford, will be in charge. It is expected A. William Sperry, New Haven; Walter P. Schwabe and James Turnbull will appraise the property.

Before the sale takes place the bondholders' protective committee will reorganize. Receiver Harrison B. Freeman has operated the road since 1918. Mr. Robinson states these is no assurance that reorganization can be effected.

During the past year $100,000 was spent by Mr. Freeman for fourteen new buses. An effort will be made to get an abatement of the $79,000 gross revenue taxes due the state.

Bonds of Detroit United in Demand

Heavy buying of the 4½ per cent first consolidated bonds of the Detroit United Railway, Detroit, Mich., now in receivership, was the feature of bond trading on March 18. These bonds advanced to 96½, a new high price since 1923, and closed at 95, up four points on the day. According to the *Wall Street Journal* there were many rumors afloat that the company would be out of receivership at an early date, but persons familiar with the situation declared this was improbable. As that paper sees it the real basis for the advance is probably due to the fact that the city of Detroit, which has pledged itself to

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	March 1926 7.36	Feb. 1926 7.35	March 1925 7.26	March 1926 7.36	May 1923 6.88
Electric Railway Materials* 1913 = 100	March 1926 156.4	Feb. 1926 155.3	March 1925 158.4	Sept. 1920 247.5	Oct. 1924 148.5
Electric Railway Wages* 1913 = 100	March 1926 224.1	Feb. 1926 223.8	March 1925 221.5	Sept. 1920 232.0	March 1923 206.8
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	March 1926 202.0	Feb. 1926 201.9	March 1925 204.4	July 1920 256.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	March 1926 207.6	Feb. 1926 206.6	March 1925 210.2	June 1920 273.8	Mar. 1922 162.0
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Feb. 1926 155.0	Jan. 1926 156.0	Feb. 1925 160.6	May 1920 246.7	Jan. 1922 138.3

Conspectus of Indexes for March 1926

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Bradstreet Wholesale Commodities 1913 = 9.21	Mar. 1 1926 13.40	Feb. 1 1926 13.72	Mar. 1 1925 13.84	Feb. 1 1920 20.87	June 1 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	Feb. 1926 161.5	Jan. 1926 164.3	Feb. 1925 151.4	July 1920 219.2	Mar. 1922 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	Feb. 1926 169.5	Jan. 1926 170.4	Feb. 1925 165.3	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Feb. 28 1926 4.617	Jan. 31 1926 4.883	Feb. 28 1925 5.285	July 31 1920 11.118	July 31 1924 3.187
Bank Clearings Outside N. Y. City (Billions)	Feb. 1926 16.58	Jan. 1926 19.63	Feb. 1925 15.74	Oct. 1925 20.47	Feb. 1922 10.65
Business Failures Number	Feb. 1926 1700	Jan. 1926 2073	Feb. 1925 1654	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	42.03	48.23	40.97	122.95	27.22

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 144 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

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pay the company $500,000 semi-annually for certain property purchased, has made a payment which according to agreement must be used to retire $500,000 face amount of the 4½ per cent bonds.

Preferred Stock Sold to New Orleans Customers

Thirty-two thousand shares of preferred stock of the New Orleans Public Service, Inc., New Orleans, La., were offered on March 17 to consumers and employees of the company. The stock has been authorized by the Commission Council of New Orleans, and the funds derived from the sale are to be used in paying for the properties of the Consumers and the Citizens companies, which were acquired by the New Orleans Public Service last December. In speaking of the matter, Herbert B. Flowers, president of the company, said:

A year and a half ago Public Service, mainly through its employees, disposed of 15,000 shares of preferred stock to New Orleans residents. The stock was offered at $96 and then at $97 a share. It is now quoted at $102 a share.

We could dispose of this entire block of new preferred stock in the East, but we want local consumers to become interested in the properties as owners, and are offering it for sale to our customers and employees.

Protective Committees for Indianapolis & Cincinnati Holders

Committees were appointed on March 18 to represent the interests of holders of $2,600,000 of outstanding bonds of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., and its underlying companies. The first meeting was in the interest of the holders of $586,000 of bonds of the Indianapolis & Southeastern Traction Company. This group appointed a committee made up of George A. Ball, Frederick D. Rose and Lloyd Kimbrough, all of Muncie; Fletcher M. Durbin, Chicago, and Fred C. Dickson, Indianapolis. The Indiana Trust Company, Indianapolis, was named as the depository.

Later a second group, representing holders of $414,000 of bonds of the Indianapolis, Shelbyville & Southeastern Traction Company, met and elected a committee composed of George C. Forrey, Indianapolis; James A. Sigafoose, Moundsville, W. Va.; Frank Bopp, Indianapolis; L. A. Coleman, Wheeling, W. Va., and C. E. Frantzen, Dunkirk, N. Y. This group named the Fletcher American National Bank as depository.

A third group representing the Indianapolis & Cincinnati Traction Company, owner of the two underlying companies and also of the Connersville line, met in the afternoon and named the following committee: George A. Ball, F. D. Rose and J. L. Kimbrough, Muncie; John J. Appel, Indianapolis; John T. Beasley, Terre Haute; C. L. Asmann, Cleveland, Ohio, representing the General Electric Company, and an unnamed representative of the Westinghouse Electric & Manufacturing Company. The Fletcher Savings & Trust Company was named depository for this committee. The committee represents bonds that are now outstanding to a total of $1,600,000.

Toledo Has Deficit in February

Despite a gain in average daily passenger travel of 4,608 revenue passengers to 144,743 in February the Community Traction Company at Toledo showed a deficit of $8,613. There were 4,052,798 revenue passengers.

The greater part of the loss in revenue was from other than passenger revenue—track rentals and miscellaneous revenues showing a decided decrease as compared with February, 1925. Operating charges totaled $210,077 and ratio of these to gross revenue was 71.35 per cent. During the first two months of 1926 the net deficit was $12.402, compared with a surplus of $12,473 last year.

14 Per Cent Increase in Passengers in Detroit in February

The Department of Street Railways at Detroit, Mich., reports a balance of net income for February, 1926, of $39,331 after the payment of sinking fund charges, compared with $38,461 in February, 1925, so that the past month shows an increase over that of February, 1925, of $870, or 2.3 per cent.

During February, 1926, 41,056,661 passengers were carried by the rail lines and 1,542,257 by the coach lines, a total of 42,598,918 passengers, compared with 37,295,539 passengers carried in February, 1925, divided 36,976,608 rail lines and 318,931 coach lines. In other words 5,303,379, or 14.2 per cent, more passengers were carried in February, 1926, than in February, 1925.

Railway revenue car-miles in February, 1926, were 4,527,663, compared with 3,945,292 in February, 1925, an increase of 582,371 miles, or 14.7 per cent. Coach revenue miles in February, 1926, were 520,689, compared with 123,075 in February, 1925.

The net revenue from all sources in February, 1926, was $458,275, after allowing for railway operating and coach operating expenses, totaling $1,571,512. From the net revenue from all sources $219,474 was deducted for taxes and interest on funded debt.

The net income after deductions for items listed previously is $238,801 for the month. From this amount, total sinking fund provisions are made to the amount of $199,469, leaving a balance of $39,331 for the month.

The ratio of railway operating expenses to railway operating revenue for the month was 75.94 per cent, compared with 68.64 per cent for the similar months in 1925. The ratio of coach operating expenses to coach operating revenue was 111.97 per cent for February, compared with 133.11 per cent for February, 1925. For the year ended Feb. 28, 1926, the ratio of railway operating expenses was 74.51 per cent and the similar ratio for the coaches was 97.54 per cent.

Railway Sells Bus Line to Competitor

R. L. May, operating the Alexandria, Barcroft & Washington Rapid Transit Line and the Columbia Pike Bus Line, purchased on March 25 the equipment and operating rights of the Alexandria Suburban Motor Vehicle Company, which is a subsidiary of the Washington Virginia Railway, extending from Alexandria to Braddock and Washington, and from Alexandria to the Protestant Episcopal Theological Seminary. With the transfer of certificates held in Virginia and the District of Columbia, Mr. May gains a monopoly of the highway transportation system in the territory served. The Alexandria Suburban Motor Vehicle Company will still continue, it is understood, its line from Washington to Falls Church and Fairfax.

A Five-for-One Split Up at Tampa.—A special meeting of stockholders of the Tampa Electric Company, Tampa, Fla., will be held on April 6 to vote on the proposition to change the capital stock from $100 par to no par. It is proposed to exchange the present 62,000 shares of $100 par for 310,000 shares of no par.

Net Income Increases.—For the eight-month period ended Feb. 28, 1926, the total operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was $29,522,318, against $28,384,142 for a similar period ended February, 1925. Total operating expenses increased from $18,608,755 to $19,249,878 for the eight months ended February, 1926. The net income for the current year was $3,648,346, against $3,255,476 for the eight-month period ended Feb. 28, 1925.

Change in Directors of Holding Company.—The directorate of the Georgia Light, Power & Railways Company has been completely changed. Those who resigned were John D. Everitt, president; F. B. Lasher, vice-president, and H. M. Earle, Lloyd Robinson, W. H. Felton and F. W. Leach, directors. Directors elected to succeed them were P. A. Wallace, Henry L. O'Brien, Grover M. Sullivan, George J. Johnstone, Arthur J. Egan and B. M. Shanley. Paul W. Fisher, secretary, was the only director re-elected. The company controls the Macon Railway & Light Company.

Surplus on Interborough for Eight Months.—For the eight months ended Feb. 28, 1926, the total revenue of the Interborough Rapid Transit Company, New York, N. Y., from all sources was $40,468,193, an increase of $1,910,619 over the corresponding period of last year. This increase is partly accounted for by the receipt in July, 1925, of a cash payment of $770,000 as part consideration for the new advertising contract, which became effective Nov. 1, 1925. There was no similar payment in the previous year. Operating expenses, taxes and rentals paid to the city for the old subway increased $478,736. Income deductions increased $259,696. The net result for the eight months was a surplus of $924,486.

Receipts Lower in Seattle.—The receipts of the Seattle Municipal Railway, Seattle, Wash., for January and February of this year were approximately $1,000 a day less than for the similar two months of 1925. During January, 1925, the average daily receipts were $17,993, while for January of this year the average receipts were $16,928. For February last year the daily average was $16.920 and for February, 1926, it was $15,880.

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Personal Items

Charles Day a Pennsylvania Director

Charles Day, Philadelphia, was elected a member of the board of directors of the Pennsylvania Railroad on March 24, filling the vacancy which has existed since the death on Feb. 17 last of George Wood.

Mr. Day is president of Day & Zimmermann, Inc., a well-known Philadelphia engineering firm. During the World War he rendered distinguished service as special representative of the Secretary of War on tours and observations through England and France. He was also a member of the Army War Council, a trustee of the United States Shipping Board's Emergency Fleet Corporation, a member of the committee of observation reporting on shipyard conditions, a member of the storage committee of the General Munitions Board and of the depot board appointed by the Secretary of War.

Born in Philadelphia on May 15, 1879, Mr. Day was graduated from the University of Pennsylvania in 1899. After a varied engineering experience he became a member of the firm of Dodge & Day, specializing in engineering, management and construction work.

In 1911 Mr. Day became president of the firm of Day & Zimmermann, Inc. He has done notable work in the construction, equipment and management of industrial and public utility plants, and is an officer and director in a number of public utility properties. For several years he was a lecturer before the graduate schools of business administration at Harvard and Columbia Universities. He is a trustee of the University of Pennsylvania, Franklin Institute and the Williamson Free School of Mechanical Trades. He is a member of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

W. H. Lemons, formerly secretary of the Rockford & Interurban Railway, Rockford, Ill., resigned on the formation of the new Rockford Electric Company. His place has been filled by F. A. Lee as general auditor.

H. A. Bentzinger, Sigourney, Iowa, will succeed his brother, Dan D. Bentzinger, as superintendent of the railway division of the Iowa Southern Utilities Company in Burlington, Iowa, when the latter goes to Centerville to take an executive position under Manager Buhlman. H. A. Bentzinger takes up his duties April 5. He has been with the utility company fourteen years.

J. de Rytter Kielland, managing engineer Oslo Street Railway, Oslo, Norway, is on a visit to this country to study American electric railway conditions. The railway system in Oslo (formerly known as Christiania) is one of the largest and most progressive in Scandinavia. Its equipment includes 167 motor cars and 186 trail cars and the system carried about 83,000,000 passengers in 1925. In distinction from most European tramway systems, a flat fare is charged with no transfers. Mr. Kielland expects to be in this country for about a month.

C. F. Handshy President Illinois Association

C. F. Handshy, special representative of the Illinois Traction System, Peoria, Ill., was for the second time in his long and active experience elected president of the Illinois Electric Railway Association at its annual meeting in Springfield, Ill., March 17 and 18. He served a previous term as president of the same organization in 1917.

Practically all of Mr. Handshy's life has been spent in railway work. As a boy in his teens he learned telegraphy, and in 1884 entered the employ of the Wabash Railroad as a telegraph operator. He progressed through the positions of train dispatcher, assistant chief dispatcher and chief dispatcher to trainmaster.

C. F. Handshy

In 1907 he entered electric railway work when he became superintendent of transportation of the interurban lines of the Illinois Traction System. He was later made general superintendent of the interurban lines. In 1913 he became assistant general manager and on Jan. 1, 1921, was promoted to general manager. Recently he has acted as special representative of the company, with headquarters at Springfield.

Mr. Handshy's re-election as president of the Illinois association is a fitting recognition of his long and active interest in the development of the industry in Illinois.

Frank W. Holaday, formerly connected with the Kansas City Railways, Kansas City, Mo., has been selected to succeed A. M. Farrell as district manager of the Oshkosh, Wis., branch and general superintendent of transportation of the Wisconsin Power & Light Company, Oshkosh, Wis.

Adolf Blunk General Superintendent at St. Joseph

Adolf Blunk has been made general superintendent of the railway department of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo. He has been with the company only since last November, going to St. Joseph from the New York office of Henry L. Doherty & Company. His career started as an employee of the Union Pacific Railroad in the maintenance of way department. Then he went to the Toledo Railways & Light Company as a junior engineer.

The war interrupted his work. Following a discharge from the army Mr. Blunk resumed his service with Doherty companies by joining the forces of the Durham Public Service Company, Durham, N. C., as railway engineer. Next came a period with the Toledo & Western Railway at Sylvania, Ohio, as master mechanic, trainmaster and then purchasing agent. Later Mr. Blunk went with the Ohio Public Service Company at Mansfield, Ohio, as railway engineer and superintendent of the gas department. He then became identified with the Portsmouth Public Service Company, Portsmouth, Ohio, as superintendent of railways. It was from Portsmouth that he went to the New York office and thence to St. Joseph. Mr. Blunk is a native of Nebraska. He received his engineering education at the University of Nebraska.

George M. Moore has resigned as electrical engineer for the Grand River Valley Railway, Grand Junction, Col., to join the Denver & Rio Grande Western, a steam railroad.

John T. Porter, master mechanic of the Northern Texas Traction Company, Fort Worth, Tex., has been transferred to the Virginia Electric & Power Company, Richmond, Va. His successor is George Hoskins, formerly general foreman. Both properties are under Stone & Webster management.

John A. Collier, formerly district superintendent of the London County Council Tramways, but lately assistant to the traffic manager of the United Automobile Services, Lowestoft, England, has become assistant to the general manager of the São Paulo Tramway, Light & Power Company. He sailed for Brazil on Feb. 27 after a two weeks tour which included the inspection of the street railways in Toronto, Detroit, Pittsburgh, Cleveland, Philadelphia, Newark and New York. Before he sailed Mr. Collier expressed his appreciation of the courtesies extended to him by the managements in the cities he visited.

Charlton Ogburn, at one time an attorney of Savannah, Ga., has been appointed vice-president by the G. E. Barrett Company, New York, investment bankers. In 1919 he was appointed executive secretary of the Federal Electric Railways Commission. During

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the war he was in charge of the electric railway division of the National War Labor Board, which fixed wages on 130 electric railways in nearly all the principal cities. In many later wage arbitrations Mr. Ogburn was personal arbitrator, chosen by both the companies and the trainmen. Since 1921 Mr. Ogburn has been engaged in the practice of law in New York.

Obituary

Randal Morgan

Randal Morgan, well known in public utility circles, died at his home in Philadelphia, Pa., on March 20. At the time of his death he was chairman of the executive and finance committee of the United Gas Improvement Company, with holdings in the Charleston Consolidated Railway & Lighting Company, Connecticut Railway & Lighting Company, Georgia Railway & Power Company, Public Service Corporation of New Jersey and other properties. He started his career in the Lancaster Iron Works, but a year later entered the law office of his elder brother, Charles E. Morgan, Jr. In 1877 he was admitted to the bar and later became a member of his brother's firm, Morgan & Lewis. Because of his devotion to cases involving corporation law, in which he acquired a reputation of singular ability, the United Gas Improvement Company in 1882 made him its counsel. In 1892 he was elected third vice-president and general counsel, in 1904 second vice-president and in 1912 first vice-president. Gradually he extended his work until he had assumed a leading part in the corporation's finances, eventually receiving the direction of its affairs as president. He headed the trustees of the University of Pennsylvania, where he had been a student. Mr. Morgan was 72 years old.

Charles W. Richards, for the last seven years general agent of the Denver & Interurban Railroad (Kite Route), operating between Denver and Boulder, Col., died in Denver on March 19. Thirty-five years of his life were devoted to railroading.

James S. Hemingway, formerly president of the Fair Haven & Westville Street Railway, now included in the Connecticut Company, died on March 15 in New Haven, Conn., at the age of 65. He was also a director of the New Haven Gas Light Company, the Security Insurance Company and the Central New England Railroad. At the time of his death Mr. Hemingway was vice-president of the Second National Bank and secretary-treasurer of the New Haven Savings Bank.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

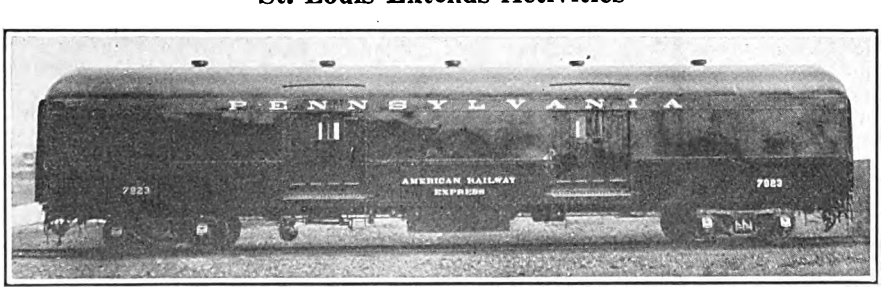
Six-Wheel Company Makes Air Brakes Standard Equipment

Continuing its policy of developing a bus which will conform as closely as possible to the high standards of traction companies, the Six-Wheel Company, Philadelphia, is equipping all Safeway six-wheel motor coaches with Westinghouse air brakes.

In deciding on this step the manufacturers had in mind the necessity of increasing the factor of safety in bus operation. The construction of the Six-Wheel bus, which combines the positive action of four-wheel brakes (all on the rear wheels) and an unusually large braking area, has always appealed strongly to railway men. Now, with the change to air brakes, the retarding ability of the six-wheeler is greatly increased and at the same time the driver is relieved of fatigue caused by continued manipulation of mechanical brakes.

It is also expected that the installation of air brakes will minimize maintenance troubles and will prolong the life of the brakes, an important item where fleets are operated.

St. Louis Extends Activities



The St. Louis Car Company, St. Louis, Mo., has entered the steam railroad field with the construction of twenty all-steel baggage cars for the Pennsylvania Railroad. The cars are 63 ft. 7¼ in. in length, 9 ft. 9¼ in. in width and weigh 87,100 lb. Delivery of the units is now being made.

Brill and Westinghouse Are Hosts at Demonstration

Standing not upon the order of its going, the group of interested spectators which had gathered to participate in the preliminary demonstration run of the Brill-Westinghouse 73-ft. gas-electric car for the Boston & Maine Railroad got off to a flying start from the Brill plant in Philadelphia on Tuesday, March 23. But while the start may have been flying, the balance of the run was anything but that, due to the fact that the Pennsylvania had other plans for its through tracks on that morning. However, speed was no criterion of the value of the trip.

Sped on their way by a farewell wave from J. W. Rawle, vice-president of the J. G. Brill Company, the group present put in the time to good advantage on the run between Philadelphia and Trenton, N. J., in examining the power plant of the 250-hp. car, trying out the Pullman-like comfort of the seats and noting the smooth-riding characteristics of the car itself. Much amusement was occasioned when some one discovered in one of the morning papers the statement that gas-electrics would soon eliminate the "horrible, smoke-belching locomotive."

Vague rumors were heard of large impending purchases of this type of equipment for branch line service on various railroads. The present car, which is the largest yet to be built for use in this country, will seat 92 persons and weighs, without load, 110,000 lb. The Westinghouse Electric & Manufacturing Company furnished the complete motive power equipment, consisting of a Brill-Westinghouse 250-hp., six-cylinder gasoline engine directly connected to a 170-kw. generator which supplies energy for two 140-hp., 600-volt traction motors mounted on the forward truck. The car was completely assembled by the J. G. Brill Company. The body is of light-weight steel. Roller bearings are provided to insure smooth and efficient operation.

Commenting upon the relative advantages of the 72-ft. car as compared with smaller units, T. H. Murphy, general engineer Westinghouse Electric & Manufacturing Company, said:

> The economies of gas-electric car operation are dependent upon several factors. Among these are low weight of equipment and the passenger load ratio. The most desirable and economical field for the gas-electric unit is one where the load capacity required is reasonably small but constant and where the engine power plant can be so designed that the full power is used continuously. Until recently only 60-ft. cars, and smaller ones, have been constructed to meet various service conditions. Such units as these have been built with power plant capacity for either single car or trailer operation. The smaller car when suitable for trailer operation is a very flexible unit, but not the most economical unless the trailer operation is continuous. Where service conditions are such that the loads are small and practically constant, and where the capacity of the 73-ft. car is adequate for the service, there is no doubt that it will prove to be the most economical as its operating costs will prove lower than the single motor car unit with a trailer or the steam train.

The present unit is one of the three purchased by the Boston & Maine Railroad from the Brill and Westinghouse companies, the two other units being standard 60-ft. cars. These have already been delivered.

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Walter J. Cummings Says Outlook for Railways Never Brighter

President of Cummings Car & Coach Company Points to Improvement in Basic Conditions in Forecasting Prosperous Future—Money for Development Will be Available When Bankers Understand Situation

AN INTERVIEW

By Charles Gordon

"THE outlook for the electric railway industry has never been brighter," declared Walter J. Cummings, president of the Cummings Car & Coach Company, in discussing the status of the industry. "Its recovery is not a thing for the future. This has already been accomplished in the sense that fundamental conditions necessary for the industry's prosperity have so changed in the last few years that it now remains only for manufacturers and operators to take advantage of the present opportunity.

"I say manufacturers and operators," continued Mr. Cummings, "because this industry is characterized by an unusually close relation between those who manufacture equipment and those who operate it. There is an entirely different relation than that usually found to exist between buyers and sellers in most industries. The long period of severe stress and difficulty through which our industry has come has thrown manufacturers and operators more closely together in meeting common problems.

"There is in this relationship a responsibility for the manufacturer that is clear cut and distinctly appreciated. Through many years there has been built up a confidence in the manufacturing end of the industry that is the greatest asset which the manufacturers possess. Their advice and help have been sought and accepted on many operating problems. They have lived up to their responsibility to the extent of setting aside commercial expediency in the effort to give the industry the benefit of their best judgment and experience."

Both a Manufacturer and Operator

As he continued to develop his thought, I was impressed with the fact that Walter Cummings spoke from the unusual position of both a manufacturer and operator. As president of the Cummings Car & Coach Company he is a manufacturer. As chairman of the board of the Chicago & West Towns Railway he represents the railway owner and operator's viewpoint. He has been consistently an optimist regarding the electric railway industry, and has insisted ever since the railways ran into post-war difficulties that the essential nature of the service rendered makes their position fundamentally sound.

Mr. Cummings' active interest in the electric railway industry dates back some 21 years, when the successful foundry and forging business that had been built up by the Cummings brothers was expanded through the purchase of the McGuire Manufacturing Company, which had earned an enviable reputation as manufacturer of trucks and sweepers. A modern car building plant was constructed at Paris, Ill., a short distance from Chicago. In addition to various types of electric railway cars and trucks, the company manufactures a large proportion of all the snow sweepers used by the industry. Recently, with the addition to its line of products of a gas-electric bus for supplementary railway service, the name of the company was changed from the McGuire-Cummings Manufacturing Company to the Cummings Car & Coach Company.

Walter J. Cummings

THIS is the fourth of a series of interviews with the heads of car building plants and other prominent manufacturers. Rapidly growing interest in the improvement of electric railway equipment throughout the industry makes the views of these manufacturers particularly significant at this time.

"Throughout our experience," commented Mr. Cummings, going back to his initial thought, "we have never found conditions in the industry more fundamentally sound or the future more promising. There seems to be a new spirit in the industry. Managements have acquired renewed courage in attacking such problems as taxes, franchise limitations and paving charges.

"Rapid progress is being made in other directions. Leading operators and manufacturers have united in pointing out the advantages of new, modern equipment to meet the demands of present-day transportation requirements. This has been approached and accepted not as a selfish scheme to build up car sales, but as a co-operative move to stimulate the reduction of operating costs and to improve the standing of electric railway transportation in modern communities. The railways are alert to the situation and have accepted wholeheartedly the spirit in which this subject has been discussed."

Modernization of electric railway cars and the replacement of obsolete equipment suggested the subject of the bus. I asked Mr. Cummings for his views on the place of the bus in the local transportation scheme and its effect on existing rail lines.

"That situation," he replied, "is already working itself out in a way that clearly indicates the economics of the subject. Where there is any considerable volume of traffic to be handled the railway remains the most economical form of local transportation. But the bus adds a new and valuable agency for handling the type of service that does not justify rail construction. It thus permits the railways to meet their obligation of providing complete transportation service to a given community without the heavy expense of constructing rail lines into districts where the volume of riding would not profitably support rail construction.

"Railway companies are rapidly absorbing the bus. With added experience, there is beginning to develop, also, a new point of view relative to the bus. Operation of this new vehicle does not mean unprofitable operation. Bus service can be made to stand on its own feet financially and a rate of fare should be provided to permit of this.

"There is still another phase of bus operation in supplementary and feeder service that is frequently overlooked.

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Development of new territory through bus operation puts passengers on the rail lines. Credit for this is sometimes overlooked when judging the bus."

There wasn't much room left for doubt as to Mr. Cummings' opinion of the usefulness of this new transportation vehicle. It occurred to me that here again he spoke from the particularly advantageous position of both a manufacturer and operator. Not only has the Cummings Car & Coach Company gone into the manufacture of buses to supplement its car building business, but the railway properties in which Mr. Cummings is interested are operating buses to supplement their service. Results of this operation have borne out his contention that bus operation by electric railways need not be a losing venture when approached from the proper viewpoint.

We touched on the destiny of the interurbans. Here again his view was optimistic.

"There are open to the interurbans two opportunities for development and improvement," he said. "These include the building of freight business and the use of light-weight one-man cars to give a frequent, speedy, comfortable and attractive service that will build passenger business on the one hand and make major reductions in operating and maintenance costs on the other. Light-weight interurban passenger cars are every bit as safe as some of the much heavier equipment that is in use. In fact, there is ample basis for the opinion that in many respects modern light-weight cars are even safer than some of the much heavier equipment that has been in use for many years."

"What about the problem of getting new money for improvements," I asked.

"In these days of plentiful money the opportunities for bankers to invest funds at attractive rates of interest are diminishing rapidly. The banker has a serious problem in finding attractive investments for surplus funds. Today the electric railways offer an attractive market for such funds, once the banker can be made to appreciate the changes in basic conditions which have taken place.

"Confidence in electric railways can and must be re-established among bankers. Once they are made to see the fundamental changes which have been brought about the present difficulty in obtaining funds for improvements will disappear. Several healthy forces are at work. Under modern franchises, electric railways are not assuming many of the unfair burdens that were imposed in the past. Managements are demanding and obtaining the elimination of these unfair burdens on the industry and the car rider. Public enlightenment on the advantages of terminable permits as a means of permitting continuous development of railway facilities is working to eliminate the periodic interruptions to progress that have accompanied the old-fashioned limited term franchise grant.

"The electric railway business is distinct among the utilities as a strictly cash business in which the customer pays for the service as he uses it. There is no way for modern communities to exist without transportation service. The industry rests on the firm foundation of community necessity. When the banker is made to realize this fact, the problems of financing will be solved. It remains only for the industry, manufacturers as well as operators, to seize every opportunity of impressing these basic facts on the bankers of the country."

In summing up his remarks, Mr. Cummings had this to say:

"Prospects, both from the operator's and manufacturer's standpoint, were never brighter for the industry. Fundamental conditions on which its success depends are sound and are improving rapidly. Now is the time for all elements in the industry to take advantage of the situation. Confidence and courage add impetus to every forward movement. Those who apply these qualities in the electric railway industry today may expect to share in the prosperity toward which all signs point."

Manganese Parts on Coast

The Manganese Steel Forge Company, Philadelphia, manufacturer of rolled and forged manganese steel parts, has just received its first order from electric railways on the Pacific Coast. The Sacramento Northern Railroad has ordered 100 journal box liners of ¼-in. manganese plate and 100 pedestal jaw shims of 1/16-in. manganese steel plate for its high-speed equipment. The parts will be shipped to Chico, Cal., where the repair shops are located.

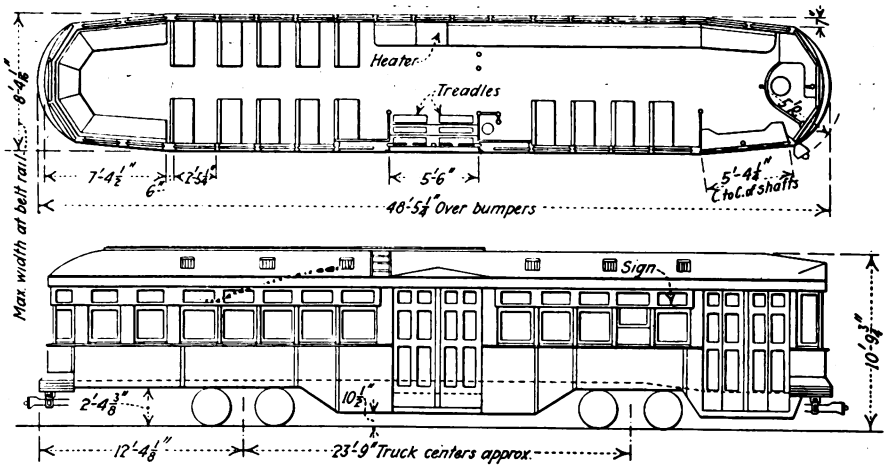
Bids Opened on Detroit Buses

Graham Brothers were low bidders on 125 buses for the city of Detroit. These are 60-passenger vehicles and the order will eventually run to 300. Graham Brothers bid $13,360 each, Yellow Coach bid $13,675, Fageol Motors Company bid $14,136 and Cummings Car & Coach Company, Chicago, bid $14,326.

Pittsburgh's Street Railway Story

Westinghouse interests in and near Pittsburgh, Pa., recently issued a souvenir booklet which was distributed to all who attended the 24th annual convention of the Pennsylvania Street Railway Association, held in Pittsburgh on March 12. The booklet contains many interesting facts and pic-

Peter Witt Cars for Detroit



From 100 to 300 new street cars will probably be purchased by the Department of Street Railways, Detroit, Mich., in the near future. Bids on the new equipment were to be opened and given consideration on March 27. Depending on the prices and terms offered, the authorities of the department will decide to what extent the acquisition of new rolling stock may be carried at the present time.

The cars will be of single-end, front-entrance, center-exit, double-truck Peter Witt type. They are desired for single-end, one-man, two-man city operation and must be adaptable for operation either singly or in trains. Double folding doors will be provided at the front end and two center exit doors are specified. One of these doors will be controlled from the exterior by a street fare-taker's valve. The two center doors will be provided with pneumatic step treadles.

The general specifications follow:

Weight	33,000 lb.
Length over all	48 ft. 5¼ in.
Truck centers	23 ft. 9 in.
Width over all	8 ft. 4 in.
Height, rail to top of roof	10 ft. 5¼ in.
Interior trim	Natural birch stained cherry
Headlining	Agasote or Panelyte, ⅛ in.
Roof	Arch
Bumpers	Elliott anti-climber
Car signal system	Faraday buzzer and bell
Compressor	Westinghouse DH-16 or G.E. CP-27
Control	Type M, lightweight
Couplers	Tomlinson automatic
Curtain fixtures	Motorman's curtain, bathroom type
Curtain material	Pantasote double-faced
Destination signs	Hunter illuminated
Door-operating mechanism	Safety Car Devices, National Pneumatic
Fenders	H-B wheelguards
Gears and pinions	Solid, heat-treated
Hand brakes	Peacock staffless
Heater equipment	Peter Smith
Headlights	Dash type with aluminum reflector
Motors	Four 35-hp., 600-volt interpole, inside hung
Paint	Pratt & Lambert Vitralite enamel
Sanders	Osgood-Bradley sand trap, Ohio Brass, Form 2, diaphragm valve
Sash fixtures	O. M. Edwards or Curtain Supply
Seats	Deep spring type
Seating material	Leather
Step treads	Cast aluminum
Trolley catchers	Ohio Brass No. 13141
Trolley base	Ohio Brass, Form 1
Ventilators	Twelve Railway Utility, Garland or Nichols-Lintern
Wheels	26-in. diameter rolled or forged steel
Special devices, etc.	Sangamo economy meter

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tures relating to the various electric railway companies with headquarters at Pittsburgh, as well as a summarized list of points of interest in and about the city. Information concerning the various Westinghouse interests was also included in the booklet.

$3,500,000 Power Plant Improvement Planned

Plans have been approved for new equipment to cost $3,500,000 and to approximately double the power output of the West Tenth Street power plant of the Terre Haute, Indianapolis & Eastern Traction Company in Indianapolis. The proposal to increase the capacity of this plant was pushed when the Randal Morgan interests, controlling the Terre Haute, Indianapolis & Eastern Traction Company, and the Insull interests, owning the Central Indiana Power Company, of which the Merchants company is a subsidiary, agreed recently to merge the two companies under the name of the Indiana Electric Corporation.

Dissolution of Storage Battery Company Planned

Action will be taken at the annual meeting of stockholders of the Railway Storage Battery Car Company to be held in Portland, Me., on April 5, 1926, to accomplish the dissolution of the corporation. At a meeting of the board of directors held on Feb. 15, 1926, the following resolution was adopted:

Resolved, That a meeting of stockholders be held to vote upon the dissolution of the corporation and it is recommended that the corporation be dissolved and that the officers of the corporation be, and they hereby are, empowered and directed to do all necessary to accomplish such dissolution, that the funds on hand be applied to paying the expenses of such dissolution.

After the payment of dissolution expenses there will be no assets for distribution.

Delivery Begun on Key System Cars

Six of the 40 new street cars ordered by the Key System Transit Company, Oakland, Cal., are now on their way to the Pacific Coast. They constitute the first shipment of 100 new cars that the company intends to place in service within the next three years, following the recommendation of the recent joint traffic survey conducted by engineers of the city of Oakland, the State Railroad Commission and the Key system. The new cars are of the one-man, two-man type. Thirty-four others will be shipped as quickly as they can be built, making a total of 40 cars for this year. The specifications for these cars were published in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 22, 1925.

General Electric Earnings Drop Slightly in 1925

For the year 1925 the combined output of the General Electric Company amounted in net sales value to $290,290,165. Although orders received during 1925 were $303,513,380, as compared with $283,107,697 in the year 1924, an increase of 7 per cent, the net sales total was nevertheless under that of the previous year by $8,761,703.

After deducting from earnings all costs of operation, including maintenance and depreciation charges, reserves and provision for all taxes, and after adding miscellaneous income from sources other than sales, the net income for 1925 was $43,170,743. The profit available for dividends after deducting all interest charges, premium on retirement of 5 per cent debentures and additions to general reserve was $38,641,217.

STATEMENT OF EARNINGS OF THE GENERAL ELECTRIC COMPANY

	1925	1924
Net sales billed	$290,290,165	$299,251,869
Less: Cost of sales billed, including operating, maintenance and depreciation charges, reserves and provision for all taxes	257,479,490	264,909,538
Net income from sales	$32,810,675	$34,342,330
Income from other sources	10,360,067	10,793,352
Net income	$43,170,743	$45,135,683
Less: Interest and discount on debentures and other interest payments, premium on retirement of 5 per cent debentures and additions to general reserve	4,529,525	5,900,135
Profit available for dividends	$38,641,217	$39,235,548
Less: 6 per cent cash dividends on special stock	1,735,576	1,195,405
	$36,905,641	$38,040,142
Less: 8 per cent cash dividends on common stock	14,407,544	14,404,980
Surplus in excess of cash dividends	$22,498,097	$23,635,162

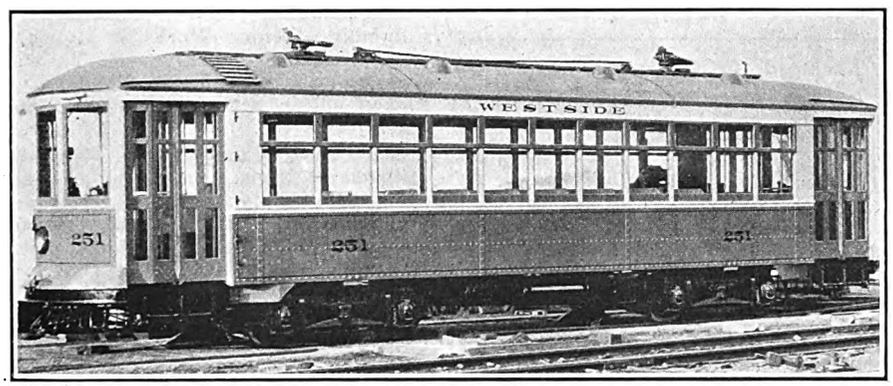
Unfilled orders at the end of the year totaled $77,860,000 in 1925 as compared with $68,958,000 at the end of the previous year.

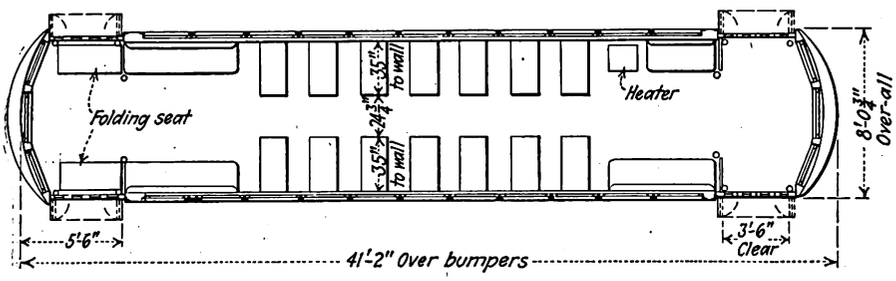
Above are comparative statements of profit and loss for 1924 and 1925.

D. P. Phelps Heads Sales for Johns-Pratt Company

Dwight P. Phelps has been elected vice-president in charge of sales of the Johns-Pratt Company, Hartford, Conn. For many years Mr. Phelps has been

Data on Westside Cars





Kuhlman Car Company of Cleveland, Ohio, has constructed six passenger motor cars for the Westside Electric Street Railway of Charleroi, Pa. The cars are of all-steel construction and seat 46 passengers. The principal specifications follow:

Weight:	
Car body	15,080 lb.
Trucks (with motors)	7,280 lb.
Equipment	2,700 lb.
Total	35,060 lb.
Bolster centers, length	19 ft. 0 in.
Length over all	41 ft. 2 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	10 ft. 11½ in.
Body	All steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse safety-control furnished by railway
Bumpers	Channel
Car signal system	Faraday buzzer and signal system
Car trimmings	Polished bronze
Center and side bearings	Brill
Compressors	Westinghouse DH-20
Control	Westinghouse type 510-A
Curtain fixtures, Motorman's curtain, khaki	
Curtain material. Body No. 63, brackets only	
Destination signs	Hunter illuminated
Door operating mechanism	National Pneumatic
Fare boxes	Furnished by railway
Fenders	Steel pilot
Finish	Enamel
Gears and pinions	Solid, furnished by railway
Hand brakes	Peacock staffless
Heater equipment. Peter Smith No. 2 hot air	
Headlights	Crouse-Hinds incandescent
Lightning arresters	Two, type K3
Motors	Four Westinghouse 510A2, inside hung
Sanders	Ohio Brass
Sash fixtures	Brill—renitent type (body)
Seats	Brill
Seating material	Rattan
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	U. S. No. 20 furnished by railway with electrical equipment
Trucks	Brill 77EX
Ventilators	Eight, Brill
Wheels	26 in. diameter

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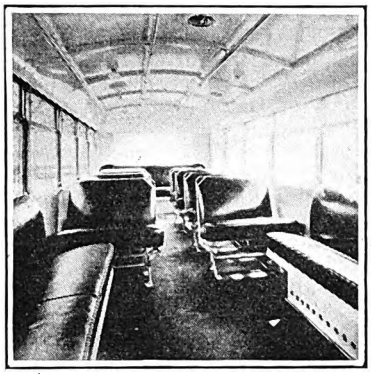
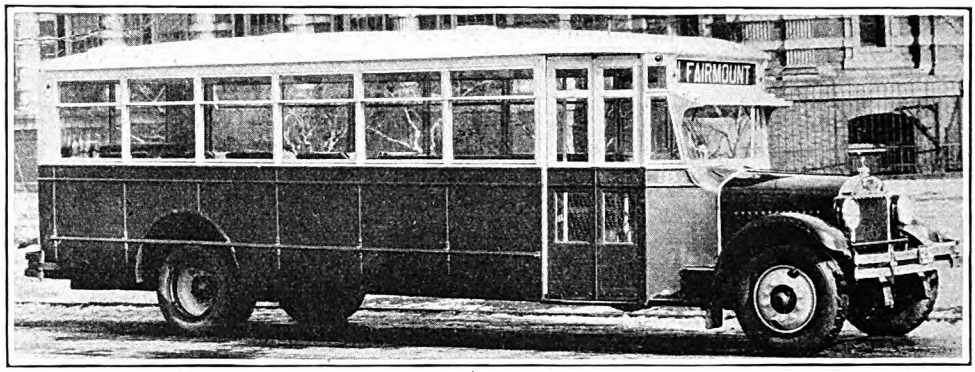
Special Type of Seats in Mack Buses for Cincinnati





Delivery has been started on the 29 Mack buses recently ordered by the Cincinnati Street Railway, Cincinnati, Ohio. These units, which are for city service, are equipped with Mack 225-in. wheelbase chassis and with Bender bodies. They are of 29-passenger capacity. The accompanying interior view shows the special type of seats and the arrangement to provide the maximum of convenience for urban transportation. A "bang-rail" or collision bar is placed along the sides of the buses where a jam is most likely to occur.

sales manager of the Colt Patent Firearms Manufacturing Company, of which the Johns-Pratt Company is an important division.

With the invention of the Noark cartridge inclosed fuse, the Johns-Pratt Company became the pioneer maker of this type of electrical protective device and developed many other electrical protective devices, among them being the Noark meter service system of inclosed meter entrance switch boxes. In recent years the production of molten materials has also been an important feature of this business. Samuel M. Stone is president of the Colt Patent Firearms Manufacturing Company and Johns-Pratt Company.

Rolling Stock

Georgia Railway & Power Company, Atlanta, Ga., has placed an order with the Cincinnati Car Company for 60 cars. These cars will be used for city service. They will be similar to those last purchased, having a capacity for 48 passengers and weighing about 37,-300 lb. This car is known in Atlanta as the "900" type.

Birmingham Electric Company, Birmingham, Ala., expects to purchase twenty side-entrance cars, each with a seating capacity for 64 passengers.

Track and Line

Los Angeles Railway, Los Angeles, Cal., is laying track on the new Macy Street bridge. In addition the entire section from Alameda to San Pedro is to be rebuilt at a cost of approximately $75,000.

Connecticut Company, New Haven, Conn., is planning to start work at once on many track changes on Water Street, Bridgeport, Conn. All tracks will be centered. A system of switches and branch tracks will be laid near the railroad depot for convenience of traffic.

Savannah Electric & Power Company, Savannah, Ga., will relay the Isle of Hope line between Pritchett's Switch in Isle of Hope, a distance of several miles. This improvement will enable the cars to make the trip in 30 minutes instead of 45 minutes as at present.

Power Houses, Shops and Buildings

Rockford City Traction Company, Rockford, Ill., is considering plans for a new garage at Fourth Street and Third Avenue at a cost of $40,000. The bus branch of the company's transportation business is being developed. Six new buses are to be in operation soon and the new garage will have a capacity for sixteen buses.

Lincoln, Neb.—A new shop and storage building is being contemplated for erection on Ninth Street between L and K at an estimated cost of $137,812. This building will house the Lincoln Traction Company storerooms and the meter shops, garage and general storeroom of the Lincoln Public Service Company.

Trade Notes

L. J. Galbreath, until recently engaged in advertising and sales promotion activities for the Bridgeport Brass Company, has joined the American Brown Boveri Corporation to take charge of publicity and sales promotion for that company as assistant to Earl G. Hines, recently appointed general sales manager. Since he was graduated from Cornell University in 1917, Mr. Galbreath has served in executive and publicity capacities with Niles-Bement-Pond Company, New York City, and Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y., with the exception of time afloat as an engineer officer with the United States Naval Reserves.

Trico Fuse Manufacturing Company, Milwaukee, Wis., has made many changes in its plant. The electrical testing laboratory has been enlarged and rebuilt with latest and best equipment installed. The offices have also been enlarged, and in the factory new lighting equipment has been installed and production facilities considerably increased. Increases have been made in the sales organization by the appointment of Herbert E. Hartstein, Eastern sales manager; Philip Rypinski, central sales manager, and Fred D. Geiler, Western sales manager.

E. O. Shreve, manager of the San Francisco office of the General Electric Company since 1918, has been named manager of the industrial department of the company with headquarters at Schenectady, filling the vacancy caused by the death of A. R. Bush.

Metal, Coal and Material Prices

Metals—New York	March 23, 1926
Copper, electrolytic, cents per lb	14.00
Copper, wire base, cents per lb	16.00
Lead, cents per lb	8.225
Zinc, cents per lb	7.72
Tin, Straits, cents per lb	65.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.40
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.70
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.01

New Advertising Literature

Morse Twist Drill & Machine Company, New Bedford, Mass., has issued a leaflet setting forth the advantages of Morse high speed drills of either the forged or milled type. It states that with drilling jobs calling for brute force a forged type drill stands up effectively, while for the regular run of shop work, the high-speed milled drill is applicable.

Compressed Air Society, New York, N. Y., has issued the second edition of *Trade Standards* adopted by the society. For convenient reference, a number of tables relating to compressed air have been incorporated in this edition. There has also been added a chapter of general information relating to commercial practices in the industry.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 67 New York, Saturday, April 3, 1926 *Number* 14

Turning the Storrs Suggestion to Good Use

GOOD use of Mr. Storrs' daily dozen of homely virtues and of Mr. Budd's remarks at the recent meeting at Indianapolis has been made by the state information bureaus and by electric railways here and there. Of course, the daily dozen taken together looks like a formidable program. But it isn't. One company, at least, is publishing one of Mr. Storrs' suggestions, prominently displayed, each month in its house organ. That is a good idea. Strange to say, the management of that company—the Boston Elevated Railway—and its employees were much less in need of having the suggestions reiterated to them than are many others. In many respects the remarks made by Mr. Storrs, Mr. Budd and President Coates at the Indianapolis meeting supplemented each other. All were of interest both within and without the industry. The material in these remarks capable of public use should be repeated again and again. The industry needs just the stimulant they contain.

The Remedy Must Not Be Worse than the Disease

REDUCTION of vehicle speeds has become so common in every large city of this country, and in European cities as well, that it has come to be looked upon as a characteristic evil. Congestion reached the point a number of years ago where it was felt necessary to take steps to remedy it. In fact, traffic regulation has been resorted to in most cases to prevent traffic jams due to lack of co-operation among drivers approaching an intersection, rather than to speed up movement of vehicles.

Hand signals given by the traffic officer in charge of the corner were succeeded by semaphores and signal lights, manually operated. Replacing the hand by a mechanical arm did not tend to speed movement, since it took away the incentive to signal vehicles individually and to depend entirely on the indication displayed. It did remove the opportunity for misunderstanding the signals and prevented accidents. With the exercise of discretion and good judgment on the part of the officers, fairly good results have been obtained with this method.

Some years ago, in an effort to speed traffic on Fifth Avenue, the principal north-and-south vehicle thoroughfare of Manhattan Borough, New York City, a "synchronized signal system" was installed. What this did was merely to take control of the signal lights out of the hands of individual traffic officers and concentrate it at 42d Street, the heaviest intersection. A cycle was worked out to accommodate the traffic in the two directions at that point. The indications were repeated electrically for other points. Naturally different conditions exist at all other intersections, and vehicles are held from moving in either direction at times, cutting down the capacity of the roadways.

Nevertheless, the same system has been adopted on several main thoroughfares in New York, and in a number of other American cities. That the results often are far from advantageous is indicated in an article in this issue. In some instances as much as 15 per cent more time is needed to pass through the congested section when the synchronized lights are used.

In marked contrast, a system of traffic control developed by engineers of the Chicago Surface Lines and installed in the Loop district has permitted speeds considerably higher than had been possible with individual manual control. The results were given in detail in an article in this paper last week, page 536. It is stated that due to the new system, combined with a rerouting of the street cars, speeds have been increased 50 to 80 per cent.

The subject of traffic regulation is under consideration by a committee of the Transportation & Traffic Association. The matter is of such import to operators of transportation systems, as well as to the general public using the streets, that it is to be hoped a real analysis will be made that will lead to improvement of traffic control all over the country.

Engineering Made a Means of Securing Better Public Relations

WHEN Chicago's Loop traffic was speeded up by the new signal system, as mentioned above, it offered an opportunity for co-operation between the street railway and the city that has been much more potent in building good will than any number of abstract statements by the publicity department.

Two years ago traffic conditions in the Loop were bad, with an ever-present congestion of street cars, vehicles and pedestrians. Knowing that something radical would have to be done, the Surface Lines laid out a plan for improving conditions that gave opportunities for joint action on the part of the city and the company. The first move was made by the Surface Lines, which took all left-hand turns of street cars out of the congested area. It involved the expenditure of some $150,000 for new special trackwork. This move was followed by an order on the part of the city prohibiting all vehicular left-hand turns in the same area. Together these two changes made a marked improvement in conditions, but left a great deal to be done.

Far more spectacular from the standpoint of unusual accomplishment has been the pioneer engineering done by the Surface Lines organization in designing and planning the system of traffic lights that have contributed so much to speeding up traffic and reducing congestion in the Loop. Elimination of useless delays, while a very desirable thing from the standpoint of the company and its car riders, is of equal value to everyone who has occasion to do business in the downtown area, either on foot or in a vehicle. The benefit is even more widespread in that for the merchants the street capacity has in effect been increased.

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Aside from the physical accomplishment of this installation, it is particularly appropriate that the co-operation of the two principal parties affected, the city of Chicago and the Surface Lines, should have resulted in making the system of traffic control a marked success.

Advertising Fundamentals Often Forgotten

ADVERTISING for patronage has been turned to good account in a campaign being conducted by the United Railways & Electric Company, Baltimore, Md., noted in the JOURNAL for March 27. It is a straight appeal with merchandising as its central theme. The campaign is one not only of big space but one with a big purpose. It points a moral both by its directness and its force. The company believes that understanding will do more to solve the transportation problem than will arbitrary rules.

Too many, far too many, advertisements in the electric railway field have been controversial in character, have offended this or that element of the public by their very wording. Others have smacked of braggadocio. In one case that comes to mind stress was laid on the snow-fighting equipment of a particular company. During the winter this company had to suspend service on a number of lines. It did not matter to the public that the storm was unprecedented in its severity. The thought that remained in the minds of the public was that the company itself had indicated that it was prepared for any emergency.

It has been said that the Baltimore campaign is one of merchandising the service. It is. But the advertisement showing Lexington Street on Jan. 20, 1926, not only sells the Baltimore service effectively, it shows the real value of the street car and the conditions against which the company must contend. It does this by suggestion, which is the highest form of advertising art.

There are times when the electric railways need to state their cases against the injustices worked against them, but these instances are not so prevalent. Even where they are, the message should be conveyed subtly and with finesse. This the Baltimore company is doing. The campaign there meets all the fundamentals of what advertising for business should be, but at the same time the opportunity is not being lost to convey an idea of some of the problems against which the company has to contend. Entirely aside from the good that the campaign will do the Baltimore company, there is a lesson in the advertising that should be made to redound to the benefit of the entire industry. It is a campaign that appears to be distinctly worth while.

The Whole Is Greater than Any of Its Parts

OCCASIONALLY a man who "lets not his right hand know what his left hand doeth" may upset tradition and common sense with the scoring of a triumphant success. Generally, however, he arrives at a down-and-out condition with quickness and dispatch. Co-ordination and co-operation of all his faculties are needed if he is ultimately to find his name staring out at him from the pages of "Who's Who." Like man—like railway. One department, one official, cannot hope adequately to cope with all the various problems which arise.

Heretofore railway managements have evinced a disheartening tendency to saddle the entire responsibility for such an important matter as car design upon the mechanical departments. There, as in the analogy drawn above, an occasional instance has occurred in which the engineering staffs have been equal to the situation, have shown a real grasp of passenger-handling requirements and have designed equipment satisfactory in every respect. In most cases, however, the cars obtained in this fashion have left many things to be desired from the standpoint of the transportation department, which has had to merchandise car rides. Cars easy of maintenance but impossible as passenger-handling mediums, or cars fairly well adapted to one type of service but possessing no characteristics recommending them for all-round service have been turned out.

The Pittsburgh Railways was one of the first to realize the fundamental truth of this tenet. For more than two years every major activity of the company has been passed upon by a committee made up of the general manager, the superintendent of equipment, the general superintendent of transportation, the commercial manager and the assistant general manager. Whether it be a matter of specifying new cars or of determining the relative merits of two operating schedules, the ideas of each department are thus capitalized.

Most recently the committee has had to pass on the design of the 50 new cars just ordered by the company. Factors such as the type of door control were considered in the light of passenger-handling efficiency as well as that of mechanical excellence. Thrashing out such matters as these in advance cannot result otherwise than in enormous savings through elimination of costly mistakes in judgment. The viewpoint of each department has much to recommend it to the careful consideration of every other department. Not infrequently the public relations department can throw light on a matter which has been puzzling the best technical brains. The mechanical department, in turn, may often reveal a startling grasp of the problems confronting the merchandising division. That the whole is greater than any of its parts is no mean theorem.

Railways Are Accused of Neglecting Their Own Interests

CHARGES of failure to comply with the common sense program of standardization constantly urged by manufacturers of bus equipment have been lodged against the railway industry. George Scragg of the International Motor Company recently made an address before the National Automobile Chamber of Commerce, the substance of which dealt with the alarming tendency on the part of state legislatures toward over-regulation of bus design and operation. His most startling statement, at the very end of his address, was that very little assistance could be expected from railway companies in coping with this situation since they themselves were notorious offenders in the matter of insistence upon individual requirements in bus design.

The allegation that "those in the traction industry who yell the most about the laws are the ones who are doing the same thing themselves by laying down special specifications" may strike a little too close home for comfort in many cases. It seems that this charge has been heard before and from within the industry itself. Were it not so, operators might conceivably gloss over the terms of the criticism and, with a neat gesture over the shoulder with the right thumb, strike the attitude of the immortal Tweed Ring cartoon by Thomas Nast—"It may be true of the next fellow but it isn't true of

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me." Unfortunately this complacent attitude cannot be adopted with entire assurance that it will sit prettily upon the shoulders of the industry.

From various sources comes the accusation that traction operators delight in pointing with pride to the individualized cars they have on their road. An operator speaks of "my car," meaning one that he has designed. It is almost with the feeling of complete futility which struck the Prophet Jonah before the gates of Nineveh that Mr. Scragg states "it seems impossible to stir him into action in this matter." Is it then true that the battle against unjustifiable surveillance of bus operation by the various states must be fought out by the manufacturers? Surely the railway companies who operate co-ordinated bus and trolley services are just as seriously affected. They cannot afford to tolerate or encourage a policy of over-legislation against bus operators, since they themselves will be among the first to suffer.

Conditions within the industry with regard to standardization of equipment are slowly but surely showing signs of improvement. Criticism has been based on the grounds of past and perhaps present performances, but there seems hope for the future. The comments which have been made on the tendency toward oppressive bus legislation by the state should meet with intelligent response from every wide-awake railway man. There is a battle to be fought and the traction companies are in a position to plant very effective artillery fire in the ranks of the enemy. It should not be possible for anyone to charge that the railway industry has been guilty of neglecting its own best interests.

Better Method of Exchanging Tokens Is Needed

FOREIGN street car tokens are accumulated in considerable numbers by nearly every electric railway which employs this type of fare collection, and the problem of their disposal is somewhat perplexing. With many of the larger companies, the accumulation is sufficiently rapid to warrant comparatively frequent exchanges. Often this is done in lots of 100 or more, token for token, regardless of value. In the smaller communities, however, the accumulation is slow. While the total number of foreign tokens on hand may be relatively large, there may be no more than ten or twenty from any one other company. Under such circumstances, it seems scarcely worth while to open direct negotiations for their exchange.

A possible solution of this problem is suggested in a letter published this week in the Readers' Forum. C. S. Speed, general manager of the Evanston Railway, proposes that a token clearing house be established to receive and return to the original owners tokens belonging to railways all over the country. His suggestion is that the tokens be accepted by the clearing house in lots of 100, no matter what the issuing company, and credited to the receiving company at 5 cents apiece, regardless of the face value when returned to the original owner; the latter would be debited with the face value.

Such an arrangement would undoubtedly be a convenience to the railways, but it seems unlikely that it could be made financially self-supporting. Only some 150 railways use tokens out of a total of more than 800. While many of the larger railways are included among the token users, the total number of foreign tokens collected during the course of a year probably does not greatly exceed 500,000. Assuming that half of this number, or 250,000 a year, would pass through the clearing house, and the collection of an average charge of 2½ cents per token, the clearing house would take in slightly more than $6,000 a year. This would not pay the cost of a permanent organization to do the work.

There is a real opportunity for the development of a satisfactory plan to handle this matter. Such an activity would seem to fall reasonably within the field of association activity. In the development of any solution, however, care should be taken not to make the remedy more complicated and difficult than the situation which it is intended to cure.

Those Who Cry Loudest Have Studied It the Least

REPLACEMENT of trolleys with buses continues to offer a topic that fires the imagination of news writers—or more particularly writers of news headlines. Over a dispatch from Detroit dated March 31 a prominent Eastern evening paper carries this imaginative head, "End of Trolley Seen in the Bus."

Examination of the article itself reveals it to be a somewhat general discussion of growing bus manufacturing activities in Detroit. Combined with this is a popular "write-up" on the gas-electric type of vehicle. There is no supporting data to justify the heading affixed in the newspaper office.

Nevertheless, thousands of headline readers have been given the impression that new evidence has accumulated to relegate the trolley to the scrap heap. Since the article emanates from Detroit, it may be presumed that it was intended to emphasize the growing importance of bus manufacture as a prospective new market for the "motor city." That the manufacture of buses is only in its infancy, and that the future challenges the imagination in the effort to foresee the magnitude of the operations which may result from the substitution of common carrier highway vehicles for individual transportation, is evident to every student of the subject. But that this development of the bus is dependent on the replacement of electric cars is a fallacy conceived in the mind of the surface thinker who knows little about the subject.

This fact is well expressed by Carl Parker, manager of sales, bus division, Reo Motor Car Company, in a recent article which appeared in the Indianapolis *Star* and is referred to elsewhere in this issue. In discussing the co-ordination of bus and trolley he said: "While the radicals are claiming that buses can efficiently replace the trolley, those who cry it the loudest have studied it the least and know least about it. . . . Don't eliminate the street car—just speed it up. Give it a chance to develop its efficiency. . . . In some cities in the United States the trolley car has never been allowed to develop its greatest efficiency. It is a better vehicle than most of us think it is because we have never had the chance to see it operate at its best. Give the trolley car the chance it has been yearning for and *you automatically put the motor bus in its best environment.*"

Those who herald the passing of the street car with the coming of the bus have adopted a narrow viewpoint indeed. To load the bus down with the burdens and restrictions of a minimum fare mass transportation agency would be fatal to its development. They are not friends of the bus who cry "Trolley Replacement!"

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Street Car Operation Hampered by Unscientific Traffic Regulation

Observations Indicate that Usual Methods of Synchronized Control Retard Railway Operation—In Many Cases Sufficient Study Has Not Been Given to Adapting Regulatory Systems to Meet Needs of Particular Situations—Results of Signal Installations in Cleveland, Syracuse, New York City, Newark, Indianapolis, Birmingham and Detroit Are Described

By John A. Miller, Jr.
Associate Editor ELECTRIC RAILWAY JOURNAL

SINCE the original installation of signal lights to control vehicular traffic on a long section of Fifth Avenue, New York City, similar installations have been tried in a large number of other places. In many cases, however, there has been little or no attempt made to adapt the system to the real needs of the individual situation. Consequently the effect of the traffic control lights frequently has been to retard vehicular movement rather than to speed it up. Electric railway operation in particular often has been seriously hampered by the installation of such systems.

Advocates of synchronized traffic control signals claim several advantages for this method of regulation, among them being increased speed of vehicular movement, fewer accidents and reduction in the number of traffic policemen required. The actual experience of a number of important cities, however, casts considerable doubt on the merit of such contentions. That all of these benefits may be expected to follow the installation of signals seems unlikely. Statistics concerning general vehicular movement are difficult to obtain, but careful checks made by electric railways show clearly that the speed of street car operation has been reduced by synchronized traffic control, and there is reason to believe from their statistics of delays that the speed of other vehicles also is adversely affected.

Champing at the Bit—Traffic on Euclid Avenue, Cleveland, Waiting for the Green Light. Twenty Street Cars and Many Other Vehicles Are Held Motionless by the Synchronized Signal System, Although No Cross Traffic Is Moving.

About a year ago it was realized that traffic congestion had become a serious matter in Cleveland and a committee was formed, under the auspices of the Cleveland Automobile Club, to study the problem. After visiting eight other large cities, this committee prepared "A Report on a Traffic System for Cleveland," one section of the report being devoted to a discussion of synchronized signals.

Concerning the result of traffic signals in Syracuse, this report stated: "After 32 intersections had been covered with synchronized signals the street railway company rearranged its schedule, cutting down the running time on some lines by six minutes. In the congested districts street cars were enabled to cut their running time in half." This statement of the committee is contradicted by checks made by the New York State Railways, which show that the running time was increased materially as a result of the installation. A summary of these checks follows:

EFFECT OF TRAFFIC SIGNALS ON RAILWAY OPERATION IN SYRACUSE

Line	Running Time Before, Min.	Sec.	After, Min.	Sec.	Increase Sec.	Per Cent
Salina Street	9	14	9	32	18	3.0
Warren Street, James Street, Onondaga Street	9	19	10	09	50	9.0
Fayette Street	5	11	5	48	37	11.9

Recommendations made by this committee that a system of synchronized signals be installed in Cleveland were followed by the city. This was done on Euclid

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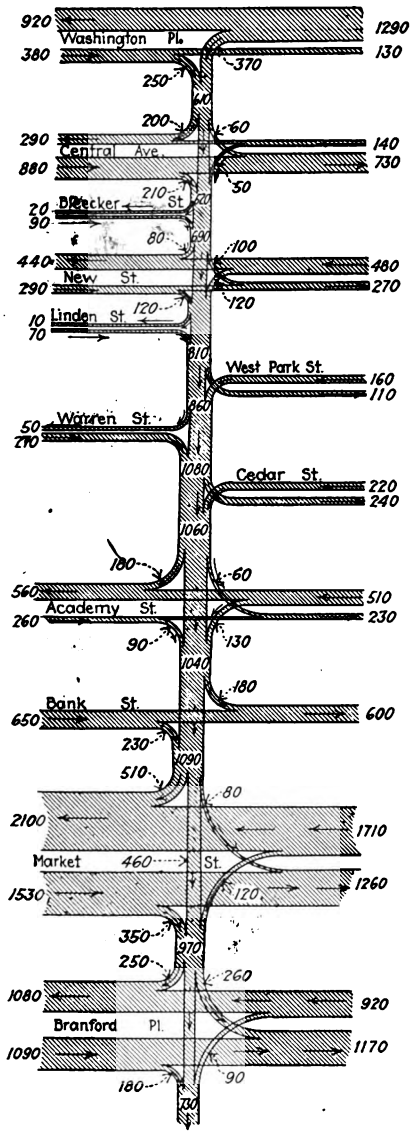
Avenue for a distance of nearly a mile east of the Public Square. Nine blocks are controlled from a tower at the intersection of East Ninth Street. Time intervals are not uniform, but are varied at will by the traffic officer in the tower. The effect on car operation has been similar to that in Syracuse. The Cleveland Railway has added one minute to the running time each way in this district. A noticeable increase in peak power demand caused by the simultaneous starting of so many cars has resulted in an increased demand charge to this company.



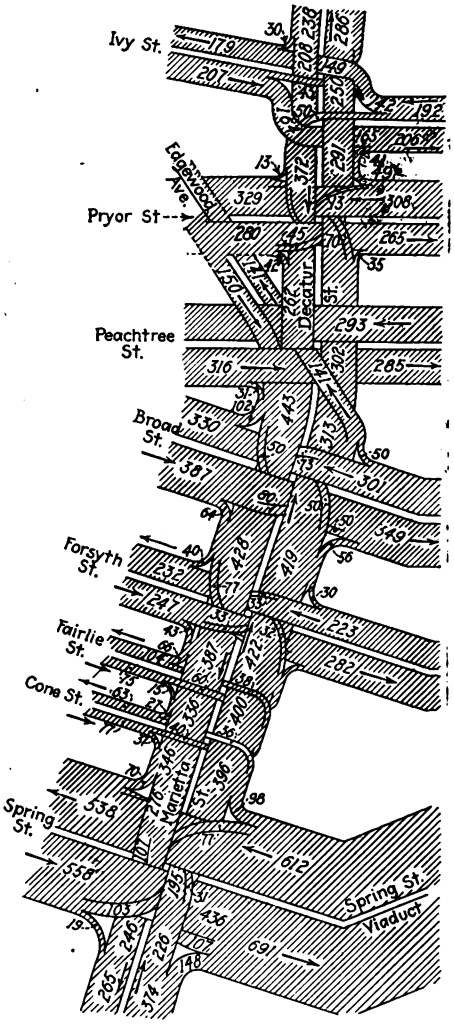
Traffic Flow Is Different on Each Cross Street, the Maximum Being Nearly Double Any Other

Investigation of the operation of cars of the New York Railways on Broadway, New York City, immediately before and after the installation of synchronized signal lights showed a decrease in speed of about 8 per cent. Failure of the control system to allow for the difference in conditions at various locations is the principal cause of trouble. In the opinion of the railway management it would be better to divide the area covered into smaller sections, independently operated.

During the summer of 1925 a system of synchronized traffic control was established on Broad Street, Newark, N. J. A master control tower was erected at Market Street, the busiest intersection, and the movement of all traffic through an area extending about ¾ mile on each side of the light was obliged to conform to its indications. Careful checks made by the Public Service Railway of the running time of its cars on Broad Street before and after the establishment of this system showed a marked reduction in the speed of operation. A summary of the results of this investigation is given in the table in the opposite column.

From this it will be seen that the average total time of delays due to passenger movement on a trip through this area remained approximately the same after installation as it was before. The average total of delays due to waiting for clear traffic signals increased from one minute and five seconds to two minutes and 25 seconds per trip. Results similar to those in Syracuse, New York and Newark are reported from other cities.

Interference with railway operation was the indirect result of the installation of synchronized signals in Indianapolis. Some months ago such a system was installed on North Meridian Street, a principal north and south automobile thoroughfare of that city. There are no electric railway tracks on this street. The normal volume of traffic on North Meridian Street is at least five times greater than the traffic on the intersecting streets, yet the intervals were not arranged in this ratio. Since the installation of the signal lights it is estimated that at least 25 per cent of the traffic that formerly used Meridian Street has been diverted to adjacent parallel thoroughfares. This has added seriously to the congestion already existing on those streets and has hampered the operation of the Indianapolis Street Railway there.



Traffic Flow in Business District of Atlanta, Ga., Showing Great Differences in Conditions at Adjacent Street Intersections

Another instance where synchronized control has caused traffic to be diverted to other streets is reported from Birmingham, Ala. Traffic signals at 24 street intersections in the business district of that city are controlled from a single point. The locations of these lights are shown in an accompanying illustration. Equal time intervals are allowed for movement in each direction with a five-second pause between. The intervals can be changed at will, 30, 35, 40 and 45 seconds being used according to circumstances.

EFFECT OF TRAFFIC SIGNALS ON RAILWAY OPERATION IN NEWARK

Date	Direction	No. of Trips	Average Running Time per Trip Min. Sec.	Average Passenger Delays per Trip Min. Sec.	Average Traffic Delays per Trip Min. Sec.
Without Signals					
June 23, 1924	North	24	13.45	1.40	1.03
June 23, 1924	South	24	13.45	1.41	1.07
Average			13.45	1.41	1.05
With Signals					
Sept. 15, 1925	North	20	15.57	1.26	2.07
Sept. 15, 1925	South	19	15.10	1.44	2.43
Average			15.34	1.35	2.25

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Placing the signals under control from a single point has had a tendency to delay railway operation unnecessarily because many intersections have lighter traffic than exists at the controlling point and time is wasted in waiting for the cross movements elsewhere to end. On the other hand, this unnecessary waiting makes automobilists avoid the area controlled by signals, thereby relieving congestion and helping the street cars somewhat. It is believed by local observers that on the whole the signal system slows up traffic more than signals operated individually to suit the needs of the various intersections would do.

Approximately 125 traffic signals are now in operation in the city of Detroit. For some years past students of traffic conditions talked about methods of diverting through traffic away from the congested business district. Finally, a so-called "loop plan" was evolved providing a route which skirted the outer edge of the business district. In addition to designated the loop a number of one-way streets were established and signals installed at many locations. This system was placed in operation Feb. 8.

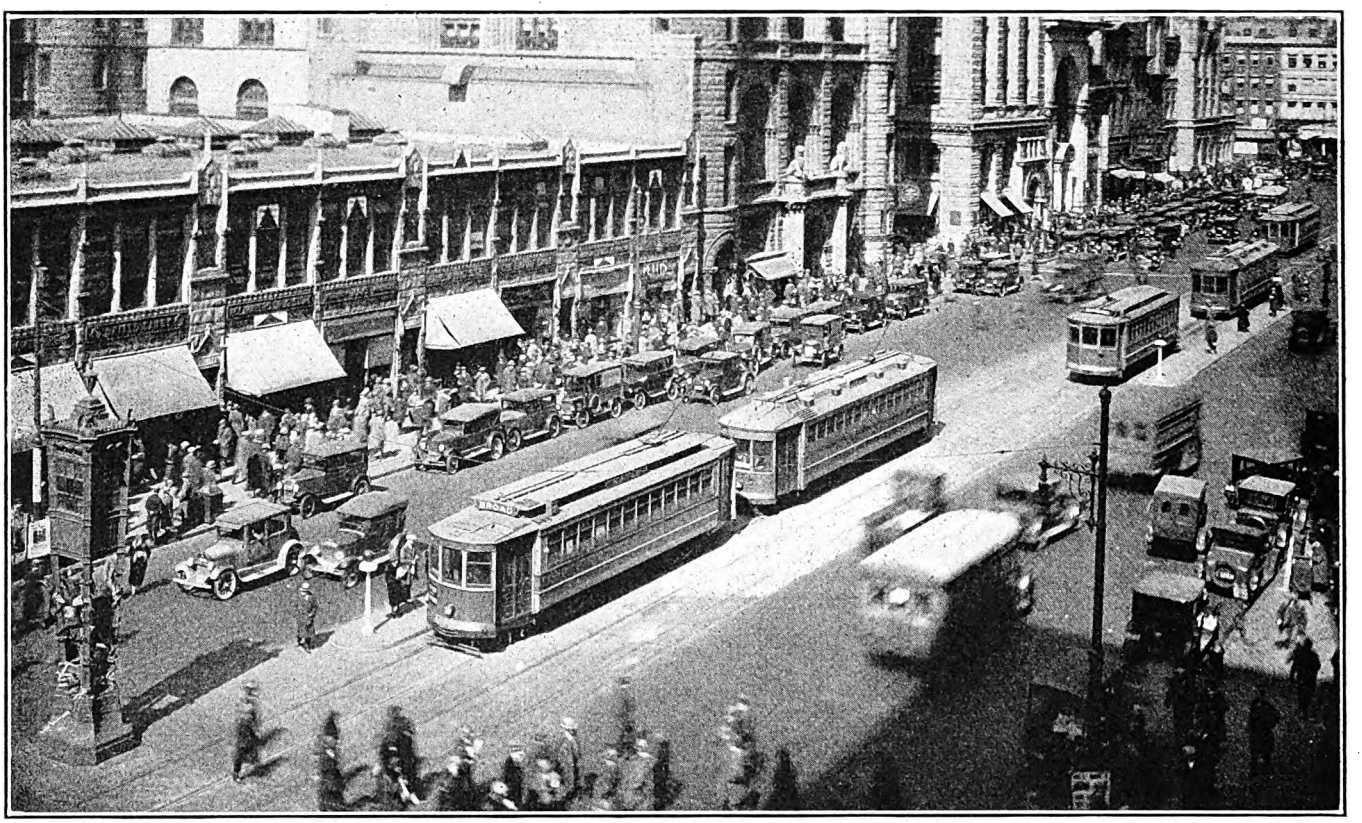
Signals are of the three-light type with red, amber and green lenses arranged perpendicularly on stanchions, located in some instances on one corner, sometimes at two corners and at other times in the center of intersections. The signals are synchronized in groups and in general have intervals of 40 seconds for east and west traffic and 40 seconds for north and south traffic with four seconds for the amber light. Because of the lack of uniformity of location of the signals drivers of vehicles must look in all directions at each intersection to find out what to do. Frequent tie-ups have occurred and congestion at times has been worse than before. Street cars have been delayed from six to eight minutes per trip through this section of the city.

Comment was made by the Detroit *Free Press* on Feb. 13 concerning traffic signal lights as follows: "An obtrusive result so far of the installation of the loop system has been the slowing down of vehicular traffic, sometimes almost to the point of obstruction. The delay is reflected in the movement of both automobiles and street cars and the difficulty in at least a part of the area affected seems to arise as the result of too frequent shifting of lights against movement on the through streets."

In Chicago a system of traffic control, differing in important respects from the usual type, has been put in operation recently. Lights at each street intersection are controlled by an individual relay. These relays are arranged to operate consecutively, so that, in theory, the signals change progressively from "stop" to "go" as traffic proceeds along the principal thoroughfares. Checks made by the Chicago Surface Lines to determine the effect of this system on car operation have shown very favorable results. An article covering this installation and its method of operation appeared in ELECTRIC RAILWAY JOURNAL for March 27, page 536.

Prior to the installation of this system careful investigation and analysis were made by the Chicago Surface Lines of the movements of vehicles on the streets affected and on the intersecting streets. Unfortunately, the task of making such a comprehensive and accurate check of vehicular movement is difficult and expensive and seldom has been undertaken in the past. In most cases where synchronized signals have been installed the installation has been made after only a cursory examination of conditions and results have been disappointing.

Investigation has shown that traffic on comparatively few streets is sufficiently uniform over a considerable distance to permit efficient control by the usual type of



Traffic Tower at Market Street Which Controls Movement for ½ Mile in Each Direction on Broad Street, Newark, N. J.

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synchronized signals. Traffic on intersecting streets varies so greatly in amount that any arrangement which is satisfactory for one intersection is likely to be unsatisfactory for all the others. Time intervals must be arranged to meet the needs of the intersection having the heaviest traffic. Time allowed for cross traffic is then unnecessarily long elsewhere.

A typical case where the vehicular movement at one cross street is much heavier than at any other nearby intersection is shown in an accompanying traffic flow diagram of a busy one-way street. At the busiest intersection there is a cross movement of nearly 3,000 vehicles per hour, while the second heaviest intersecting street has a cross movement of not much more than half that number. Consequently the maximum intersection requires about twice the period needed for cross movement at any other point.

When all or nearly all of the vehicles move for a long distance on the principal thoroughfare passing by the heaviest intersection it has sometimes been found advantageous to hold vehicles at more remote intersections rather than to allow them to pile up at the point of maximum cross traffic. The usual situation, however, is that many vehicles turn off into side streets before reaching the heaviest intersection. The waits caused by synchronized control constitute an unnecessary loss of time to such vehicles. Examination of the traffic flow diagram already referred to shows that the total number of vehicles turning off into side streets is much larger than the number which continue past the controlling point. Under these circumstances there is no danger of piling up traffic at that point and more expeditious movement is possible without synchronized signals than with them.

Another accompanying traffic flow diagram shows the movement of vehicles along a section of Marietta Street, Atlanta, Ga. These figures were compiled by the Beeler Organization during its study of the transportation situation in that city. Conditions are entirely dissimilar at every one of the intersections shown and it is obvious that synchronized traffic control could not be operated efficiently in these circumstances. Traffic on this street, however, is fairly representative of traffic on many streets in the business district of American cities. Consideration of these various factors, therefore, indicates that the installation of the usual type of synchronized traffic control is unlikely to result in an increase in the speed of vehicular movement.

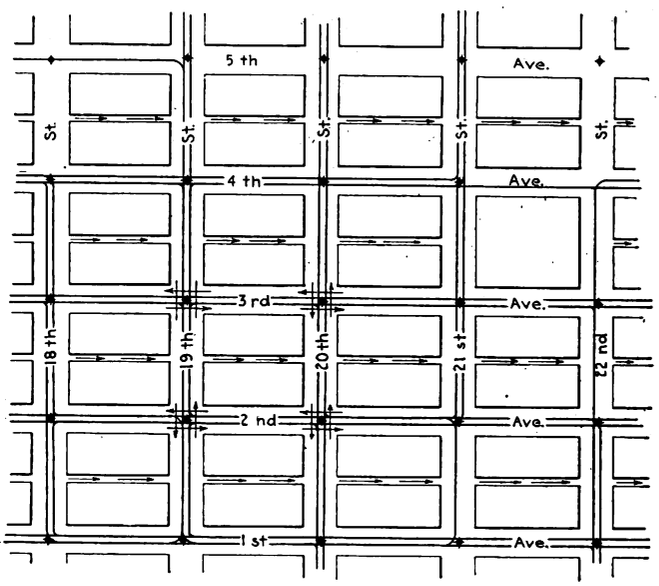
Synchronized Signals No Advantage from Safety Standpoint

The second claim usually made in behalf of synchronized traffic control is that it reduces accidents. There are almost no authentic statistical data to show the effect of signal installations on accidents because few, if any, cities have kept records in a manner to yield such data. It has been stated that accidents on Michigan Avenue, Chicago, within the limits covered by the initial traffic signal installations a couple of years ago, have been materially less than before that installation. Similar opinions have been expressed in other cities that have tried this type of regulation, but actual figures to permit reaching definite conclusions are lacking.

The National Safety Council recently made a special study of conditions in some of the larger cities of this country. One of these cities was Philadelphia, which has a low automobile accident rate. It was the judgment of the engineers who made this survey that effective traffic control was the outstanding factor in reducing accidents in Philadelphia. Both automatic signals and traffic officers are employed and the investigators decided that from the safety standpoint there is little to choose between the two methods of regulation.

That synchronized control reduces the number of traffic policemen required is the third contention of its advocates. This has been accomplished in many instances because pedestrians and automobile drivers as soon as they become accustomed to the working of the system follow its indications without supervision by the police.

Despite the disadvantages of the ordinary synchronized system resulting from the difference in conditions at various street intersections some sort of supervisory control appears to be needed to prevent the confusion which arises when traffic officers at adjacent intersections fail to co-operate properly. A flexible



Layout of Synchronized Signal System in Birmingham, Where 24 Intersections Are Controlled from a Tower at Third Avenue and Twentieth Street

system of traffic control was tried by Gen. Smedley Butler when he was safety director of the city of Philadelphia. Under this scheme the movement of all traffic on Broad and Market Streets was governed by the indication of powerful lights located high up on the four sides of the City Hall tower. As these lights could be seen only by the drivers of vehicles approaching the City Hall it was necessary to retain practically the same number of traffic policemen as had previously been employed. The lights were used primarily to guide the policemen and the drivers of vehicles looked to them for direction. This made it possible for each officer to exercise a certain amount of discretion in controlling traffic at his particular intersection. Regardless of the signal indications, east and west traffic could be allowed to move when there was no north and south traffic, and vice versa. Unnecessary delays due to unequal volumes of traffic on the various cross streets were thus much reduced.

The chief fault of this plan was its failure to give proper information to vehicles going away from the City Hall and to vehicles on cross streets. Not every intersection had a traffic policeman and this lack created much confusion at such points. After a short trial the plan was abandoned in Philadelphia. As sufficient

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time had not been allowed to demonstrate its possibilities nor to iron out the difficulties connected with its operation, this abandonment can hardly be considered a condemnation of the system. Since then many synchronized sections have been installed.

Signal lights were installed recently on Sixteenth Street, Washington, D. C., according to a plan somewhat similar to that being tried in Chicago. This is a wide boulevard without street cars. At first the signals were synchronized and various timing arrangements were tried out. Crossing this boulevard at right angles is Massachusetts Avenue, another heavily traveled thoroughfare. The difficulty experienced with the synchronized system was that when the lights were set to show green on Sixteenth Street for a sufficient time to permit vehicles to travel any appreciable distance the interval was too long for Massachusetts Avenue, with the result that considerable congestion occurred. On all other cross streets it worked out very satisfactorily.

After various experiments local authorities have developed what they term a "staggered system." This system ties the lights up into two-block series. Starting at the beginning of the street, the first two blocks are green, the second two blocks red, the third two blocks green, and so on. These lights are timed on dry days for 30 seconds and on wet or snowy days for 35 and 40 seconds. An automobile starting at the beginning of the green and traveling at a 22-mile rate of speed (the regular limit) completes the first two blocks just in time for the second two to turn from red to green, and so on through the entire length of the street, making it possible to travel the entire length of Sixteenth Street without stopping and without interference from cross-town travel.

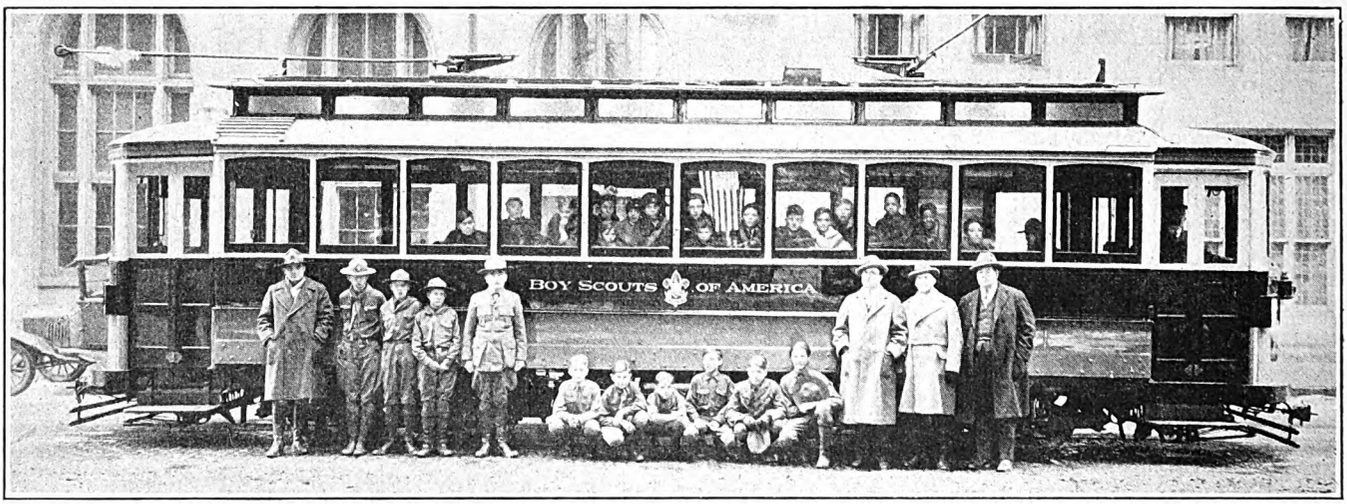
By this system the speed of the vehicle can be controlled. That is to say, by lowering the time of the lights the speed can be increased, and by increasing the time of the lights the speed can be decreased. The result has been almost universal public approval of this system, while only a few weeks previously, under the synchronized system, the public was thoroughly disgusted with traffic lights.

Summarizing the experience of the various cities mentioned in preceding paragraphs, it appears that there are four general requirements for a successful traffic control system: (1) To adapt the system to the needs of the particular local situation; (2) to confine the control to such locations as are seriously congested; (3) to establish interlocking control only at intersections where conditions are similar; (4) to employ a sufficient number of traffic policemen to supplement the working of the mechanical signals by human intelligence, and to allow them wide discretionary powers to give the system flexibility.

Grand Rapids Enlists Support of Boy Scouts

IN AN effort to establish new public relation contacts with local organizations, the Grand Rapids Railway has just inaugurated a new scheme in conjunction with its original car-naming plan. L. J. DeLamarter, general manager of the railway, is experimenting with the plan of adopting organization names that will have far-reaching favorable reactions from the various groups within the city. Previously the names of prominent citizens had been adopted to replace the old style number system.

On Feb. 14, in response to requests from the local council of the Boy Scouts that a car be painted in their colors, bear their insignia and be known as a "Boy Scout car," Mr. DeLamarter adopted this suggestion and presented the boys with a beautifully painted car. Officers of all branches of boy scout work in Grand Rapids responded to the action and, after much publicity, dedicated the new car with special exercises on Saturday afternoon, Feb. 14.



Presentation of Boy Scout Car by General Manager DeLamarter

Resplendent in red, white and blue paint, with the scout insignia done in colors on the side panels, the car was placed on the Pantlind Hotel siding and a public inspection held. Representatives of all the scout troops in town were on hand and Mr. DeLamarter made a presentation address, which was responded to by John M. Brower, president of the Scout Executive Council. The exercises were concluded with three rousing cheers given by the boys for the railway company at the request of Fred B. Pantlind, head of the Sea Scouts, whose boys will share in the use of the car. After the exercises, the boy scouts were taken on a ride about the city in their new car. It is planned to place the car at the disposal of the scouts on all special occasions.

The Grand Rapids Railway has been receiving many letters of commendation for the new car and parents of boy scouts are sending letters in daily telling how their boys are standing at attention as the new car goes by.

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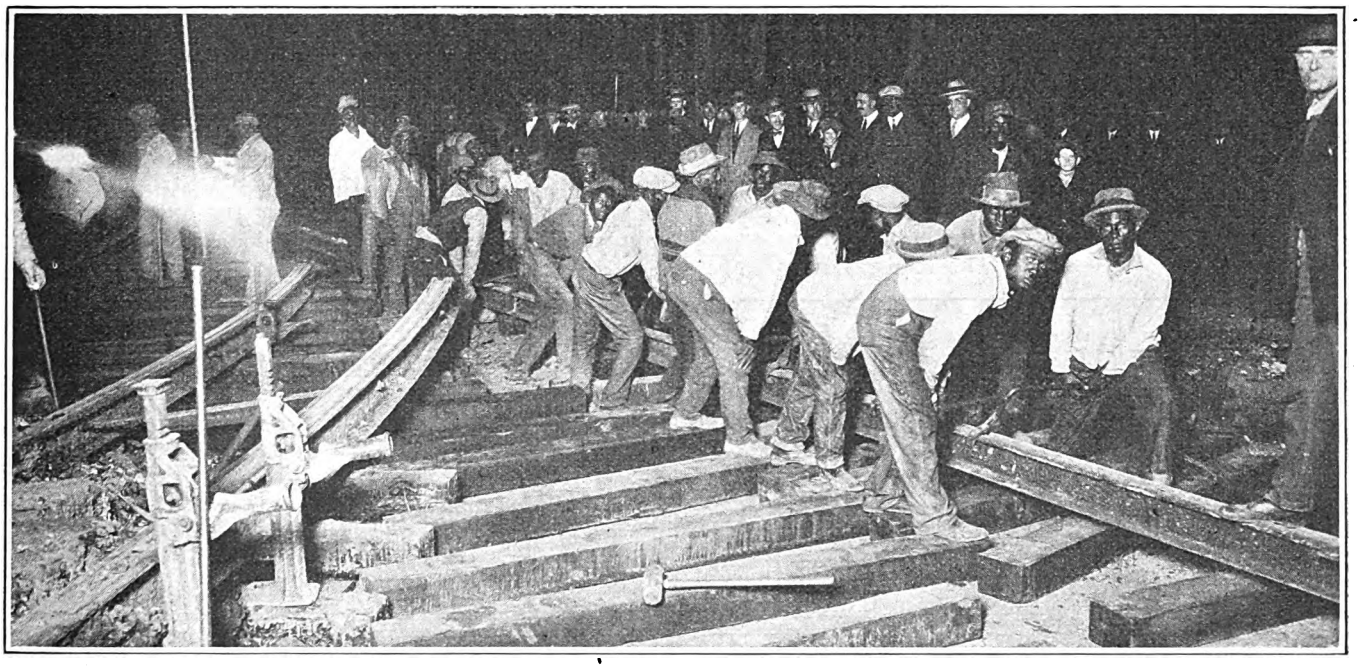
Wide Gaging 4,762 Ft. of Double Track in New Orleans

By E. S. Meyers
Superintendent Way and Structures New Orleans Public Service, Inc.

This Length of Track Was Changed from 4-Ft. 8½-In. Gage to 5-Ft. 2-In. Gage in One Night, so as Not to Delay Traffic—It Forms Part of the Work of Having Only One Track Gage for the New Orleans Public Service Lines



Flashlight Photograph of Overnight Changeover of the Tracks from Standard to Wide Gage on Magazine Street and Jackson Avenue, New Orleans

YEARS ago, when cars were first introduced in New Orleans, it was the prevailing custom to grant a franchise for a car line to the highest bidder. Several companies entered the field, and as time wore on there were as many as eight separate companies operating car lines. As each company was independent no thought was given to a systematic scheme of car routing. The first company to lay its tracks adopted the standard gage 4 ft. 8½ in., and the other companies adopted the wide gage of 5 ft. 2½ in. As a result, when the companies were merged and the New Orleans Public Service, Inc., took over the holdings it was confronted with the problem of rearranging the entire system, and therefore determined on a policy of using only one track gage to permit flexible operation of the cars. Fortunately, out of a total track mileage of 220.48, only 28.48 miles was of the 4-ft. 8½-in. gage. Approximately 2 miles was double gage; that is to say, it had three rails to permit the use of either gage of car. All of the remaining track was of 5-ft. 2½-in. gage.

In the latter part of 1925 extensions were built in order to reroute certain car lines. The rerouting involved the Jackson line, which operated on the 4-ft. 8½-in. gage track. Since the extensions were wide gage, the rerouting necessitated wide gaging 4,762 ft. of double track. This it was decided to do in one night, and the night of Wednesday, Oct. 28, was the one selected.

The accompanying map shows the section of track on which the gage had to be widened. As will be seen, before the widening of gage was done, the cars on the Jackson Avenue line turned into Jackson Avenue at St. Charles Avenue, where there was a layout consisting of a double branch-off 4-ft. 8½-in. curve. The double track then extended on Jackson Avenue a distance of about 4,800 ft., crossing two double street car tracks and four single car tracks. At the end of the line there was a turnout, and midway on Jackson Avenue there was one crossover. The rerouting necessitated changing the car housing, and in order to do this, a connected curve branch-off was required at Magazine Street. All of the intersections were paved.

The problems which confronted us in making this change were as follows:

1. Wide-gaging the trucks of a sufficient number of cars to operate the new line.
2. Maintaining the paved roadways for vehicular traffic.
3. Maintaining the operation of the car lines crossing Jackson Avenue, four in number.
4. Wide-gaging the track and special work in one night.

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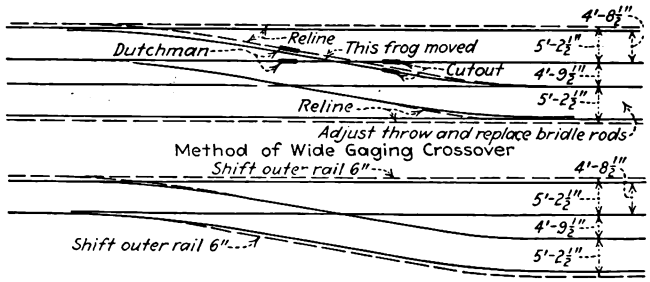


Method of Wide-Gaging Crossovers and Turnouts

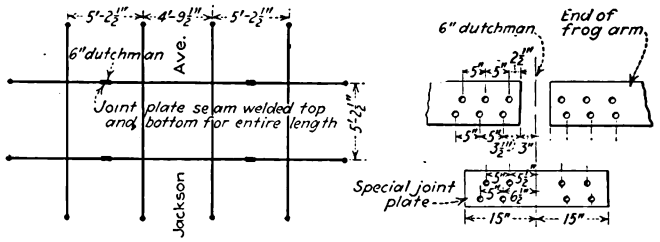
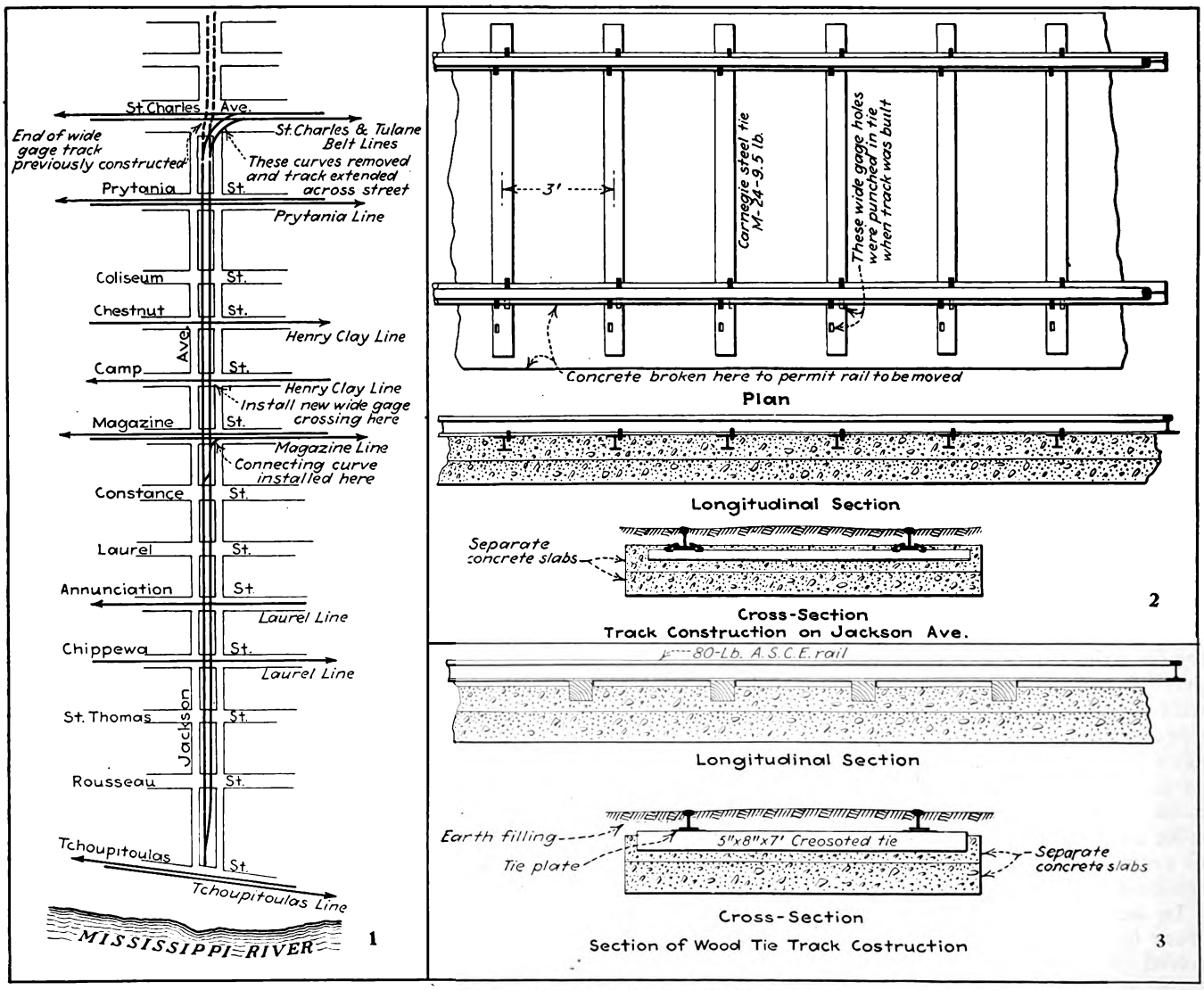


Diagram Showing Method of Wide-Gaging a Crossing

The equipment department took care of wide-gaging the trucks, while the roadway department handled the remaining work. The traffic situation was studied and a plan was worked out showing the manner in which traffic could be diverted without much inconvenience to the public. Six police officers were required to handle the traffic situation. The plan was submitted to the Department of Public Safety, which co-operated with us and carried it out during the period of wide-gaging.

Arrangements were made with the transportation department in regard to the time in which the track could be taken over by the roadway department, and also the manner in which the lines crossing Jackson Avenue could be rerouted, during the period the crossings were being wide-gaged. The roadway department estimated that the work could be done in six hours, but taking into account the possibility of inclement weather, it asked for eight hours. As the transportation department desired to operate the new line at 5 a.m. the following morning, the roadway department asked for the track at 9 p.m. On this basis, the Jackson line was cut at 9 p.m. and the track turned over to the roadway department for wide-gaging.

The work started as planned at 9 p.m. The Prytania Street cars were diverted to the Magazine line, while these double-track crossings were being wide-gaged and vehicular traffic was diverted from one intersection to the next. At 10 p.m. the Prytania Street crossings were wide-gaged and turned over for operation. The Henry Clay-Coliseum line was routed over the Magazine line and the Laurel line was routed over the Tchoupi-



The Line Wide-Gaged Used Both Steel Tie and Wood Tie Construction

No. 1. Section changed to wide gage. The work involved wide-gaging 4,762 ft. of route, wide-gaging fifteen crossings, one crossover and one turnout, installing one new crossing, removing one branch-off (at St. Charles Avenue) and connecting straight track at this point. No. 2. Track construction on Jackson Avenue. No. 3. Section of wood-tie track construction.

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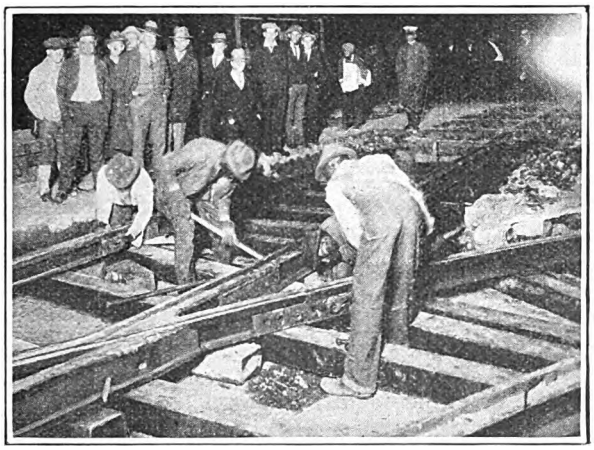


One Gang Shifting the Rails at the Crossing of St. Charles and Jackson Avenues During Changeover from Standard to Wide Gage

Tearing Up Track Preparatory to Shifting Tracks During the Overnight Changeover from Standard to Wide Gage at the Intersection of Coliseum Street and Jackson Avenue

toulas line, to permit the wide-gaging of these crossings. These crossings were completed by 11 p.m., after which the lines resumed their regular routings. The Magazine line was next rerouted over the Henry Clay-Coliseum line, and the double crossings at this intersection were wide-gaged by about 12.15 a.m. A portion of the curve on Magazine Street was installed a few days prior to wide-gaging, and by 10 p.m. this curve was connected up to the Jackson Avenue track.

As the crossings were being wide-gaged separate track forces were wide-gaging the tracks. The split switch crossover and the turnout were wide-gaged in less than one hour. The entire track was wide-gaged at 1:30 a.m., but it was 2:15 a.m. before a car could go over the line, due to some delay in connecting up at St. Charles Avenue.

Details of Program

The track which was wide-gaged was a double track 4,762 ft. long, equivalent to 9,524 ft. of single track, and was located in a reservation in the middle of the street, known in New Orleans as "neutral ground." All intersections, which occurred at every cross street, were paved with either wood or granite block. The rails were 80-lb. A.S.C.E. Of this stretch, 887 ft. was laid on Carnegie steel ties, imbedded in concrete, as shown in one of the track sections on the opposite page. The remaining portion of the line was constructed of wooden ties imbedded in concrete, as shown in the lower track section.

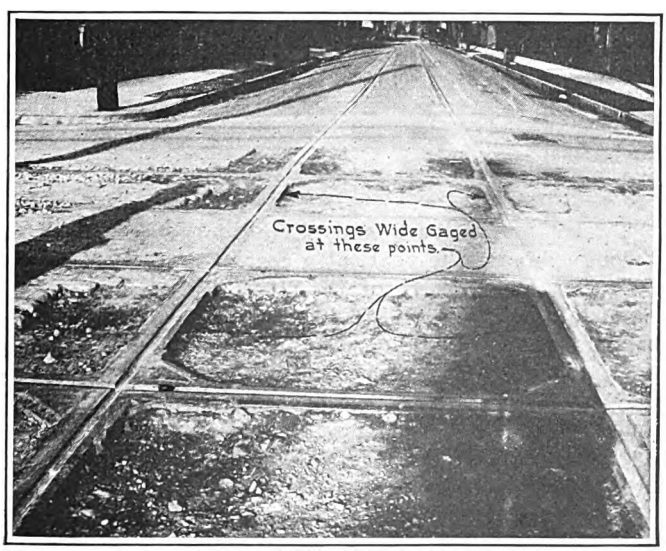
The details of the method and program of wide-gaging were thoroughly studied and worked out in advance after a series of first-hand inspections had been made and information tabulated from records on file. Detail drawings of the work to be done were prepared. Every precaution was exercised to avoid last-minute changes in the program. Track foremen were organized into groups, and each foreman was assigned a certain amount of work and a certain number of men with which to do it. The foremen had both oral and written instructions and then were taken to the job and made acquainted with the work required of them.

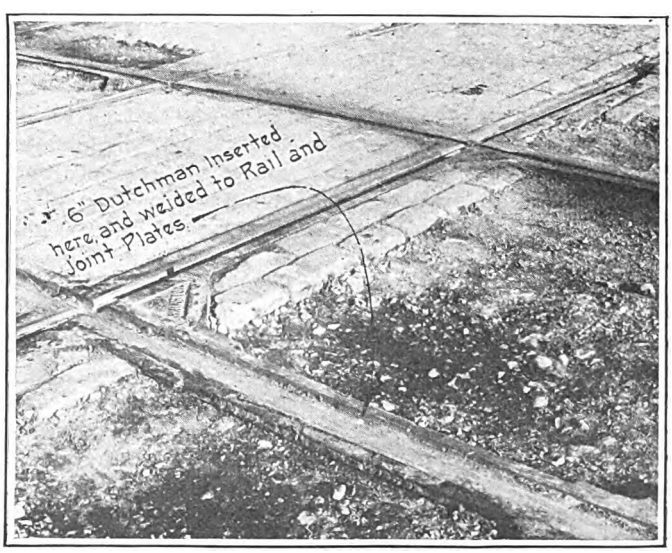
Preparatory Work

The preparatory work consisted of excavating a strip along the outside rails, extending to the end of the tie on both tracks along the entire length of the neutral ground. Where the track crossed paved intersections the pavement was broken for about a foot in width and refilled with slag to allow the passage of vehicles.

The crossings were treated in the same manner, all concrete being removed to the level of the ties and refilled with slag.

The day prior to the wide-gaging, all the rails which





Method of Wide-Gaging Crossings on Jackson Avenue. These Two Views, Taken After the Work Was Done, Show Where the Crossings Were Widened and Where the "Dutchmen" Were Inserted

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were connected to the arms of crossings were cut 6 in. by an acetylene torch and rebolted with the same plates, each piece cut being used temporarily as a "dutchman."

The steel tie track presented a rather difficult problem as the rails were fastened to the ties by a combination clip and bolt. Matters were somewhat simplified by the fact that the steel ties, which were of the I-beam type, had been punched when originally installed to receive clips that would hold the rail to 5-ft. 2½-in. gage. The old bolts and clips, except on every third tie, were removed. This was done by placing a cold chisel against the bolt head and striking it about six times with a heavy maul. Since the concrete was about an inch higher than the top of the steel tie, it was also necessary to cut this level with the top of the tie to permit the rail to slide over and rest on the tie. To permit the insertion of the bolts and clips in the new holes a small amount of the concrete had to be cut at every hole. A sufficient amount of new clips and bolts were purchased in advance, and these were inserted in the outer wide gage holes and left loose.

The Work of Wide-Gaging

Everything being ready, the work of wide-gaging began. First, the crossings received attention. These were wide-gaged by removing the "dutchman" previously cut off of the connecting rails, so as to leave the crossing arms free, and then spreading the crossings by the use of two jacks. To do this, the jacks were laid in a horizontal position, one end resting against the rail to be spread and the other end blocked against the devil strip rail. The jacks were then "pumped" until half of the crossing had attained the new gage. The new "dutchman" was inserted in the opening and the new long plates were fastened in place. As it was necessary to cut off 6 in. of the rails connected to the crossings, new holes had to be burned in all the connecting rails to fit the fish plates. This was done by the use of acetylene torches on the night of wide-gaging.

As the crossings were being wide-gaged the rails were spread over 6 in. and properly gaged up. All ties were spiked. In the stretch of steel ties the remaining clips were removed. When the rail was thrown over, the weight of the rail caused it to wedge under the new clip which had previously been placed in the outer hole. After the track was gaged up the inside clips were placed and fastened.

The crossover was wide-gaged by making cuts, previously calculated, from joints at the heel of the frog on the main and cross lines and moving the frog along the main line the proper distance. The pieces cut were then dropped in the joints at the toe of the frog to fill the gap. Only one frog was moved. It was then necessary to reline one rail on each end of the crossover by gaging it to the rail that had not been moved. The throws and bridle rods at each end were then readjusted to fit the 5-ft. 2½-in. gage. The process followed with the crossover is shown in a diagram.

The gage of the turnout at the end of the line was changed by simply relining the rails. This caused the outside switch points to be drawn back toward the frog, but the distance was negligible so far as car operation was concerned. As in the case of the crossover, the throws and bridle rods had to be readjusted to the 5-ft. 2½-in gage.

At Magazine Street, where there was a double-track crossing, the connecting curve had previously been installed, except for the turnout on the Jackson Avenue line. This curve had been installed on an 8-in. slab that was poured ten days in advance in order to attain the proper strength before it had to be used. The portion of the Jackson Avenue line where the new special work was to be located had been placed on I-beams to allow the slab to be poured under the track while cars were using it. On the night of wide-gaging, this turnout was installed and the standard gage rail drawn out to meet it.

The new wide gage track for the new route of the line had been brought up to St. Charles Avenue, the street at which the standard gage track turned. The portion of these curves which lay over the new line was excavated and placed on I-beams so that an 8-in. slab for the new line could be poured in advance. At the same time the slab across St. Charles Avenue along the new route was poured. In order not to interfere with vehicular traffic, which is very heavy at this point, the slab was poured with Lumnite cement half way across the street and then immediately bridged with 4-in x 12-in. planks in such a way that there was no weight on the slab. The other half of the street was then excavated and the slab poured. When this slab had attained its proper strength the I-beams under the curves were removed and the track let down on it. On the night of rerouting the old curves were removed by being cut with acetylene torches and the new rail was laid to connect to the new wide-gage track. These rails were immediately brought to the proper line and surfaced on slag. The following morning the track at this intersection was paved with Kentucky rock asphalt, on top of slag. One half of the roadway was paved at a time, so as not to interrupt traffic.

The force consisted of ten foremen, 200 laborers and three acetylene cutters. The equipment consisted of oxyacetylene tanks mounted on motorcycles, a Universal crane mounted on an electric truck, a Brownhoist mounted on a motor car and Differential bottom dump work trains for handling slag. Light clusters were suspended from the trolley wire along the entire length of track.

Improved Tracks in Atlanta

MORE than $600,000 was spent by the Georgia Railway & Power Company in track maintenance and improvements in Atlanta during 1925. Among the heaviest items were the following:

New and rebuilt tracks	$303,000
Track maintenance and repair	145,000
New paving	100,000
Building construction and maintenance	27,000
Cleaning and sanding tracks	25,000
Paving maintenance	10,000
Signal maintenance	6,000

Twelve major track and paving jobs were carrried through during the year, at a cost of more than $345,000. Double-tracking of the River line was the most important job, costing $76,000. Other expensive undertakings were rebuilding and special work on Ponce de Leon Avenue, costing $76,000; double-tracking McDaniel Street, at a cost of $46,000; double-tracking and rebuilding the Soldiers' Home line, at a cost of $42,000, and new track on Mitchell Street, constructed at a cost of $27,000.

The track department's maintenance account showed a decrease of $34,745, or 18.084 per cent, under the expenditures for 1924.

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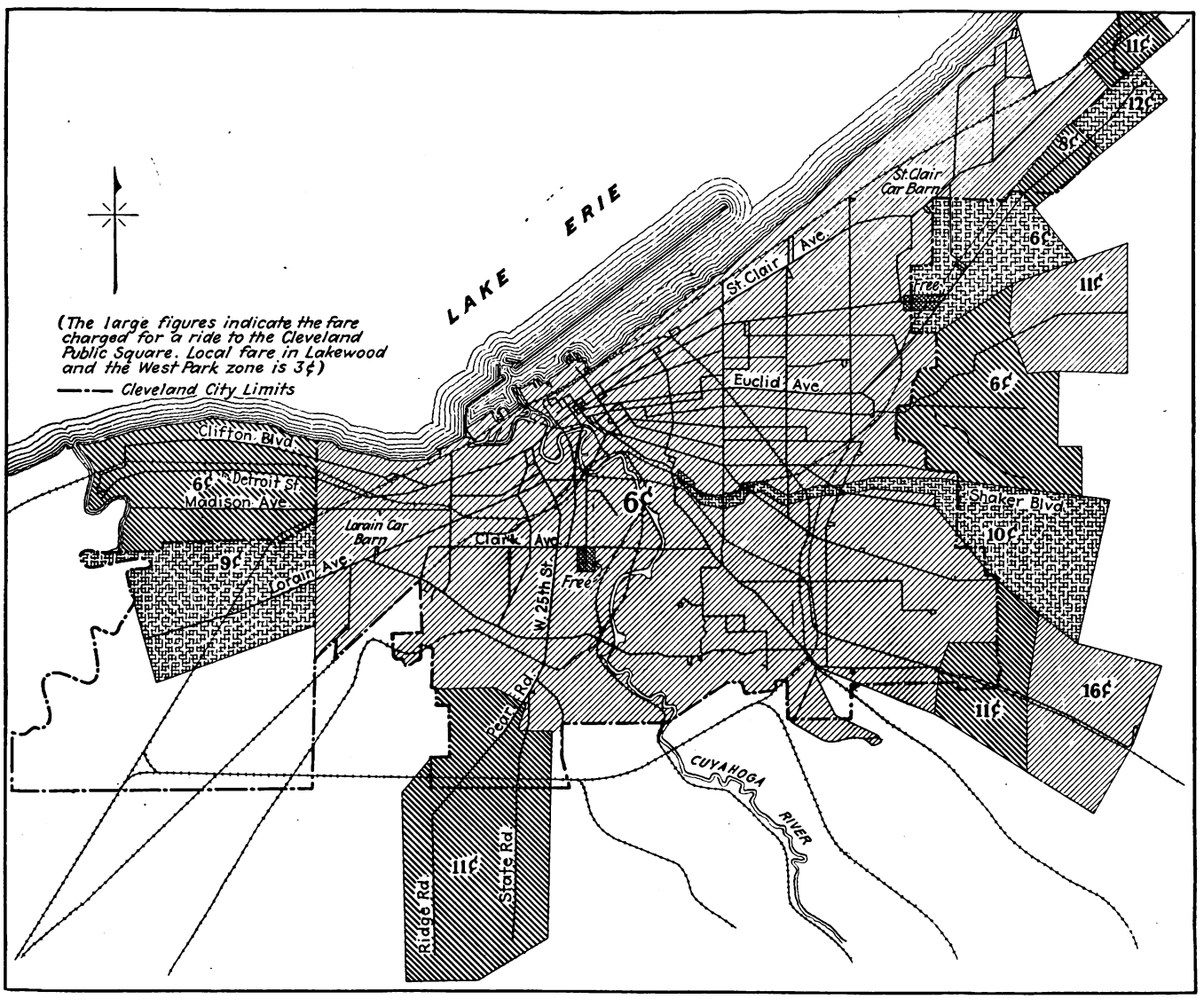
Readjustment Necessary in Cleveland's Tayler Grant

Recent Report of the Greater Cleveland Transportation Committee Recommends Removal of Limitations to Increase Market Price of the Common Stock to Par—Present Operation by Company Is Commended—Construction of Subways Should Be Deferred

CERTAIN difficulties have arisen in recent years in the operation of the Cleveland Railway under the provisions of the Tayler grant, which first became effective March 1, 1910. Most important of these has been the question of providing new money since the close of the war. The natural provision for financing has been through the sale of additional blocks of common stock, which, according to the Tayler grant, must be sold at par. The dividend rate is likewise limited to 6 per cent. While there has been ample investment money available in recent years, market conditions have been such that the Cleveland Railway common stock could not be sold at par, thereby effectively cutting off the source of new money in this natural channel. During the past five years the Cleveland Railway has expended more than $5,000,000 for new property, about one-half of which was provided by special allowances and the other half through the operation of the regular maintenance allowance for replacing equipment. The special allowances were made available from authorizations by the city to pay for the new property as a replacement of older property regarded as obsolete.

Such practices are regarded by the Greater Cleveland Transportation Committee as "financing through the fare box." This committee, whose report was released late last year, was appointed under the authority of a resolution of the metropolitan council and consisted of



Transportation Committee Decries the Present Inequality of Fares of the Cleveland Railway and Recommends Local Changes that Are Estimated to Increase Gross Revenue $1,000,000 Annually. The Present Fares to and from the Public Square Are Shown on the Map

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three members of the Cleveland City Council and representatives of Cleveland Heights, the East Cleveland Commission and the city of Lakewood. This committee was instructed to study the entire metropolitan transportation situation and has divided its report into seven sections, abstracted in the following paragraphs:

THE TRANSPORTATION SITUATION

All service, according to the report, must be unified and must be under public regulation and control. The importance of this principle was evidenced by the vigorous action of the city of Cleveland and suburban cities surrounding it, resulting in the repeal of legislation which had placed the control of bus operation in the streets of Greater Cleveland under the State Public Utilities Commission.

The report decries as a folly a recent movement to grant outside interests a bus franchise. From the testimony offered in the public hearings held by this committee several outstanding facts were established. C. J. Spencer, general manager of the Metropolitan Electric Tramways, Ltd., of London, England, said:

> The answer purely on the ground of commercial possibility to the man who suggests that street cars ought to be scrapped or could be scrapped is that the first result of that scrapping would be that you would have to pay a great deal more in fares than you do today.

At the same meeting Alderman Smithson of Leeds, England, reported that after visiting many cities and observing bus and electric car operation the tramways committee of Leeds had decided to recommend an expenditure of $2,500,000 on the city's electric car equipment.

C. E. Smith, consulting engineer for the special survey committee of the St. Louis Board of Aldermen, stated in open hearing that the motor bus does not give faster service and is more expensive for hauling masses of people. He said: "If it were possible to use only buses, the total transportation cost of Cleveland would jump from $17,000,000 annually to $30,000,000. This would mean an increase in fare. There would also be the problem of much greater congestion on the streets because of the large number of buses required."

In order better to inform the riders of Cleveland on transportation matters and to promote the good will of the community the committee recommends that a public relations department be established by the company.

TRAFFIC CONGESTION

The increasing use of automobiles, equaling 17 per cent annually, and the consequent increase in the number of machines entering the central congested area of the city, the committee thinks, may provide its own remedy in the lack of ability to park if not to operate. Street congestion is an inevitable feature of city life. So far as the city of Cleveland is concerned, it is gratifying to know the subject is receiving earnest consideration, through the opening of new traffic arteries.

THE TAYLER GRANT

Conclusion is reached by the committee that the Tayler grant probably represents the most important step that has ever been taken toward reconciling the demands of the populace for adequate transportation service with a natural desire for profits by those who undertake to furnish such service. The Cleveland Railway, through its stockholders, owns the physical property. The routing and frequency of cars, construction of extensions and betterments are directed by the city. Stockholders are entitled to an interest or dividend return of 6 per cent, no more and no less. To obtain this, provision is made for the fluctuation of fare, determined by the rise or fall of a stabilizing fund. If by expiration of time the life of the grant should be reduced to less than fifteen years, then the railway company has the right to charge a maximum rate of fare and the city loses control over the service.

Through the operations under this grant the physical property has been maintained in first class condition. The company today is sound and solvent, the stockholders have received 6 per cent return on the par value of their investment without interruption, and the present rate of fare in Cleveland is 6 cents (5 5/9 cents if tickets are purchased).

While the city does not guarantee the return on the stock, it is in effect insured, and in case the city should exercise its right to purchase, the stock is callable at 110.

As described before, the operation of the grant is defective today in the provision of new money. John J. Stanley, president of the Cleveland Railway, contends that the root of the trouble lies in the 6 per cent limitation of the dividend rate and that 7 per cent would place the market value of the stock at par and hence solve the present difficulty.

In view of other testimony given at the many hearings the committee does not agree with the suggestion of raising the dividend rate, but in its stead makes the following recommendations, which in its opinion will produce a market value of par:

> First—Extend the life of the grant to 1950 (it now expires in 1944).
>
> Second—Amend Section 21 to provide that the rate of fare shall be such that, after deducting operating, maintenance and other allowances specified in the grant, will enable the company to pay 6 per cent interest on its "invested capital."
>
> Third—Raise the "interest fund" originally fixed by Judge Tayler at $500,000, so that the rate of fare will be increased when the fund is depleted to $500,000 and shall not decrease until it reaches $1,100,000. This recommendation is made because the gross earnings of the company are double what they were when the Tayler grant was drafted.
>
> Fourth—To rectify what appears as a defect in the grant, allow the company to pay a commission not exceeding 2 per cent for the selling of new stock.
>
> Fifth—The grant provides that the railway company can charge the maximum rate of fare when the unexpired term of the grant shall be less than fifteen years. The committee recommends that the company at such time be allowed to create a stock retirement fund by charging an additional ½ cent per car ride and 1 cent per motor coach ride, exclusive of transfers. The fund so created would be held in trust to amortize the capital value of the company. This provision is regarded by the committee as practically insuring the permanency of the grant or the return of the capital invested.
>
> Sixth—The committee recommends that the company start to set aside, as an annual sinking fund, 1½ per cent of the gross income received.

SERVICE AT COST

While the committee states that any attempt to provide service at cost for the individual car rider must be at best an approximation, it decries as preposterous that there should be nine different rates of fare now in force in the metropolitan area. The map reproduced shows that some passengers are carried as much as 9 miles in the city limits for the regular fare, while others also within the city limits are being charged 11 cents for a 4½-mile ride. The committee proceeds to

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make several concrete suggestions of local fare adjustment which it calculates will produce $1,000,000 additional revenue annually.

Operating Economies

Under the service-at-cost principle of the Tayler grant all economies operate for the benefit of the car riders rather than the stockholders. "This so-called lack of incentive for economical operation has received more criticism than any other feature of the grant." The committee has endeavored to develop information that would prove or disprove this criticism and states that no evidence has been presented to it that would justify such criticism.

There is one factor, however, in the cost of operating that makes Cleveland appear in a somewhat unfavorable position. Comparison with other city systems of comparable size indicates that Cleveland is paying a larger amount in the settlement of personal injury claims than five other companies. The cities cited in comparison are St. Louis, 6.83 per cent; Cleveland, 6.7 per cent; Detroit, 3.46 per cent; Pittsburgh, 3.27 per cent; Baltimore, 3.21 per cent; Philadelphia, 3 per cent; Cincinnati, 2.06 per cent.

While recognizing the rights of claimants to receive just and adequate compensation, the fact might well be emphasized that it is the car riders who pay, whether the amount of the jury's award be high or low. The committee was advised that this unfavorable comparison to other cities was not peculiar to the Cleveland Railway alone, but applies to the steam roads and industrial concerns operating in the city of Cleveland and vicinity.

Several other specific operating economies are being made by the company and were reported by the city street railroad commissioner. The installation of watt-hour meters on all motor cars is estimated to save 10 per cent of the energy consumption, totaling $75,000 per year. A simplified form of transfer slip will enable conductors to handle fares more effectively. Adjustment of service to meet seasonal changes in traffic has been more closely scrutinized than in the past. Rerouting of cars on certain west side lines is estimated to save $75,000 a year. Substitution of motor coaches for street cars on three lean routes will reduce the present deficit of $249,000 and may result in profitable operation.

Rapid Transit

In 1919 a rapid transit commission made a report based upon a survey by the firm of Parsons, Klapp, Brinckerhoff & Douglas, recommending the immediate construction of a subway from the Public Square under Euclid Avenue to East 22d Street, Superior Avenue to East Twelfth Street, Ontario Street to the market house, and extending the present west side subway under Superior Avenue to the Public Square. This was estimated at $15,000,000, but now the committee believes the cost would be almost double. In 1919 the question was submitted to the voters of Cleveland and defeated by a decisive margin.

While the committee states that it is possible to build subways in Cleveland, there are some unfavorable conditions that may increase the cost and the question is one of financing.

The Van Sweringen plans for certain additions to rapid transit have not yet been completed. For this reason, and on account of the high cost involved, the committee recommends that subway construction be deferred at least until these local plans have been formulated more definitely.

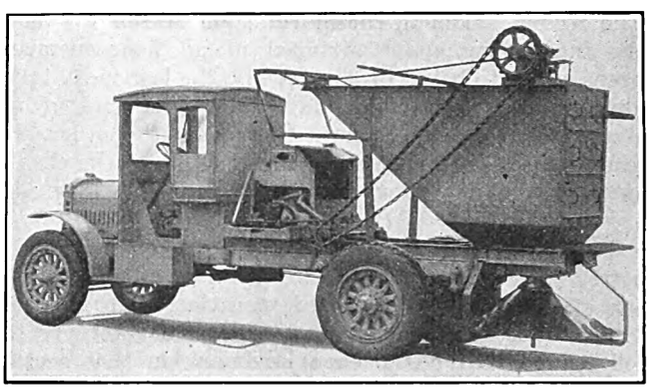
Metropolitan Transportation Board

Because there appears to be no existing agency which is in position to consider from a co-ordinating point of view the many problems of passenger transportation in the Cleveland metropolitan area the committee recommends the formation of a permanent transportation board; the functions of the board would be advisory only; it would hold regular and frequent meetings, and would be certain to develop valuable suggestions and recommendations to the public authorities.

Some of the questions to which the board would direct its attention are betterment of street car service, the most effective co-ordination of street car and motor coach service, the future financing of betterments and extensions by the Cleveland Railway, co-operation among the four municipalities and, lastly, rapid transit lines.

Automatic Sand Spreader Proves Economical

ONE of the problems of bus operation, securing traction on slippery pavement, has been solved by the Public Service Transportation Company, a subsidiary of Public Service Railway, Newark, N. J., by the construction of an automatic sand spreader. In the past it has been the practice of this company to spread sand liberally on grades and asphalt-surfaced roads in wet weather. This spreading was done by hand, and while the method proved satisfactory enough, the labor expense was considerable. Recently two old bus chassis were rehabilitated and equipped with power-operated



Old Bus Chassis Converted by Public Service Transportation Company into a Machine to Spread Sand on Slippery Pavements

sand spreaders. A large bin on the rear part of the body carries the sand. From this bin it is fed down upon a revolving cone mounted below the truck frame. The design is a combination of that of the Public Service Transportation Company and Haiss Company engineers. A separate power plant is used to drive the spreader. This has been found to be more efficient and economical, as the speed of the cone would otherwise be entirely dependent upon the speed of the vehicle. With separate drive, however, it is possible to govern more closely the amount of sand distributed. Two vehicles of this type have been built and are now in use, one on the North Hudson bus routes at Weehawken and the second at Paterson.

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An Exchange of Bridges Takes Place in the Beaver Valley

BECAUSE of the desire of the Pennsylvania Railroad to reconstruct its main line between Pittsburgh and Cleveland, in order to avoid passing through the center of New Brighton, and to eliminate some grades, a new right-of-way was constructed. This involved the building of a new bridge crossing the Beaver Valley diagonally between Beaver and New Brighton.

As seen from the pictures, this new bridge involves the destruction of the old structure owned and operated by the Beaver Valley Traction Company and used by it jointly with highway traffic between the communities on either side of the Beaver River.

The pictures show the Pennsylvania Railroad bridge constructed up to the piers immediately on either side of the structures to be destroyed. On Sunday, March 14, the main line of the Beaver Valley Traction Company was cut at this point, connection being made by means of a temporary bus line between the boroughs of New Brighton and Beaver Falls, using the present highway bridge about 2,000 ft. upstream.

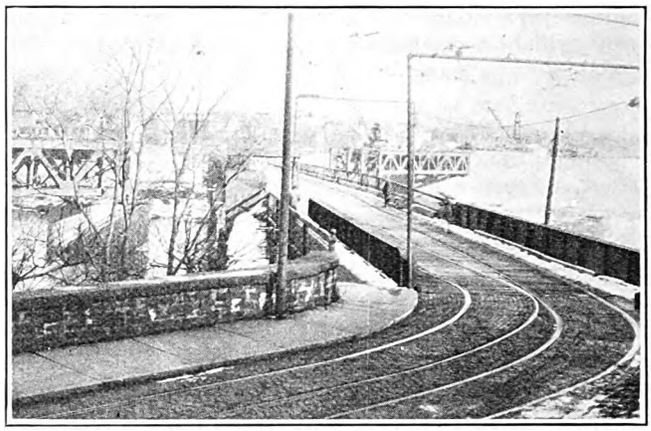
Upon completion of the new Pennsylvania Bridge and trackage circumventing New Brighton, the Pennsylvania Railroad will refloor the present railroad bridge and turn it over for the joint use of highway traffic and the trolley cars.

A very favorable contract was drawn up between the Pennsylvania Railroad and the Beaver Valley Traction Company, the intent of which was that the railroad company would protect and reimburse the Beaver Valley for all expense and losses occasioned by this change. It is estimated that four months will ensue before the cars can use the new route.

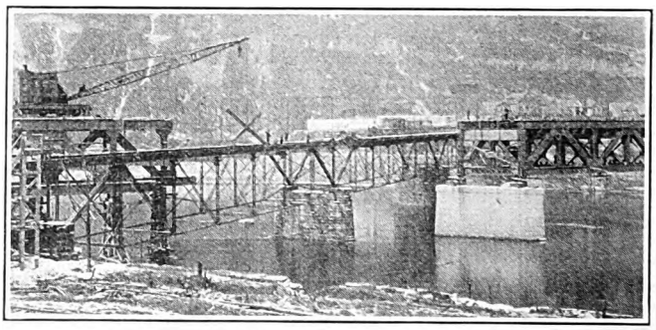
The first view shows the bridge situation on March 9, a few days previous to the close of traffic over it. The second, taken in the morning on March 15, shows the interfering spans stripped of all floor members preparatory to being dropped, while the last view, taken about noon of the same day, shows one end of the structure dropped. Shortly thereafter the other side was dropped. After this the construction of the closing span of the new Pennsylvania Railroad bridge progressed rapidly.

This exchange of bridges, when completed, will give better line and grade to the Pennsylvania Railroad, will effect a slightly improved operation for the Beaver Valley Traction Company and will remove forever the toll bridge that has been a landmark in that section of the country and substitute a free bridge for traffic over the river. An interesting sidelight on the situation will be what measure of success will be possible from the operation of the Beaver Valley Traction Company, cut in its middle and connected by buses.

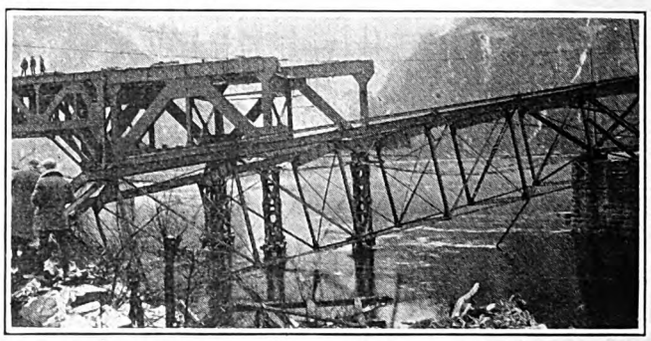
In order to eliminate as far as possible the transfer of local passengers traveling in the zones on either side of the river, the connecting bus route extends from the center of New Brighton paralleling the present track, turning north near the river, crossing the highway bridge over the Beaver River and extending westward for seven blocks to Beaver Falls. Arrangements have been made to connect with all cars. A 10-cent cash fare with free transfers will be charged, except that street car passengers may make this connection with no additional cost, as all forms of street car transportation, including the weekly passes, will be honored, including free transfers to and from the connecting buses.



View No. 1—The Beaver Valley Traction toll bridge over the Beaver River, showing the shore spans erected for the new Pennsylvania Railroad bridge which will cross it at a diagonal. Beaver Valley Traction service and highway traffic were discontinued on Sunday, March 14.



View No. 2—The Beaver Valley Traction bridge stripped of floor members by Monday morning, March 15, and ready to be dropped into the river.



View No. 3—By noon on Monday, the 15th, one end of the interfering span had been dropped. Immediately thereafter the other end of the span was cut and work of completing the river span of the Pennsylvania Railroad bridge was continued.

Removing the Old Beaver Valley Bridge. While Awaiting the New One Passengers Will Be Handled by Buses

The change from rail to operation with the connecting bus line was made easily and without interruption, as indicated by the editorial in the Beaver Valley *News* of March 16, as follows:

Congratulations

Patrons of the Beaver Valley Traction Company in the upper Beaver Valley are today profuse in their expressions of gratitude to the company for the admirable manner in which it is taking care of traffic during the bridge changes. The burden of transportation fell upon the traction company when the period came for dismantling the overgrade bridge to permit of the completion of the new Pennsylvania Lines bridge. With its usual foresight and capable management the traction company took hold of the problem and when the day arrived for action all was set. There were no hitches. Expense of equipment and man power was not considered. In brief, the company "delivered the goods." General Manager C. D. Smith and others of the management, and the car operators and coach drivers are alike to be congratulated.

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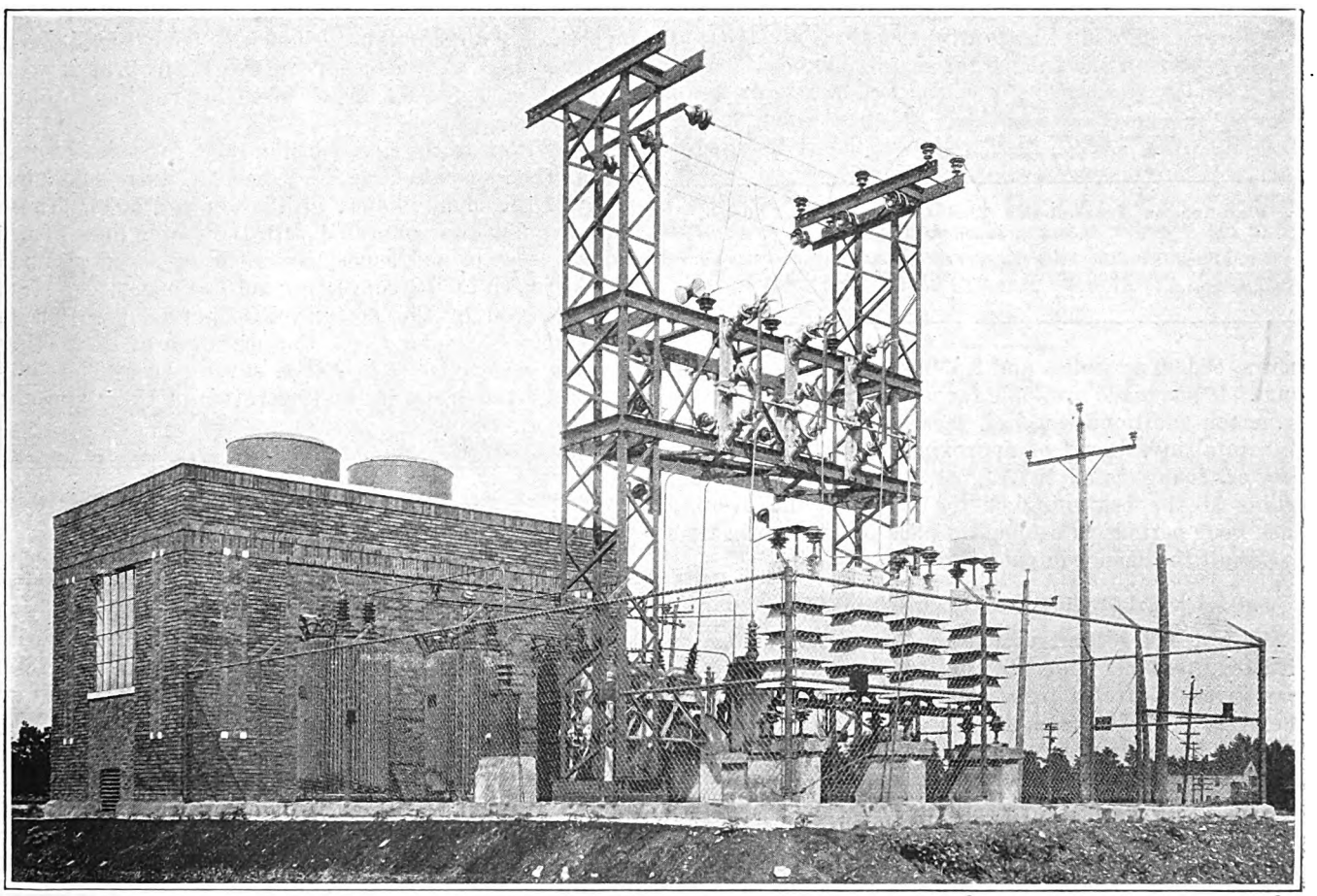
From Receivership to Prosperity in Three Years

FOURTH ARTICLE

Substantial Savings Made in Cost of Power Generation on Chicago, Aurora & Elgin Railroad—Close Control of Heaters Has Reduced Maximum Demand—Three New Substations Built—Advantageous Contract Made with Public Service Company of Northern Illinois



New Automatic Substation at Bellwood. Outdoor Equipment Is Mounted on Pedestals to Avoid Trouble from Snow

IMMEDIATELY upon assuming control of the Chicago, Aurora & Elgin Railroad, the new management engaged C. F. Hirshfeld, director of research of the Detroit Edison Company, to supervise and control the operation of its power plant and substations. After a thorough analysis of the problem, Professor Hirshfeld recommended changes and improvements in the power plant to increase the continuity of power supply and to reduce the cost of generation. As a result of the execution of this program substantial savings in the cost of power generation have been achieved.

One of the innovations introduced was an unusual method of reducing the central-station and substation demands and kilowatt-hour consumption during the rush-hour periods in the winter months. This railroad has for years used electric heaters in all passenger coaches, in consequence of which the kilowatt-hour consumption and maximum demand rise sharply during the cold winter months. To reduce the heater load without inconvenience to the passengers, men at certain designated stations turn on or off the heat on each train stopping at the station. By this system the control of the matter of heat is taken almost entirely out of the hands of the conductors and brakemen, particularly during the rush hours, and it is possible to make sure that not more than a predetermined number of car heaters will be in use in any given moment. It has been possible to keep the temperature of the cars at a comfortable point, even in most severe winter weather, with only about half the car heaters turned on at any given time. The interval, in minutes, during which heat is turned off is never very long for any particular train. Following this system has saved substantially 1,000 kw. in power demand and has greatly reduced the kilowatt-hour consumption during the winter months.

At the same time careful studies were made to deter-

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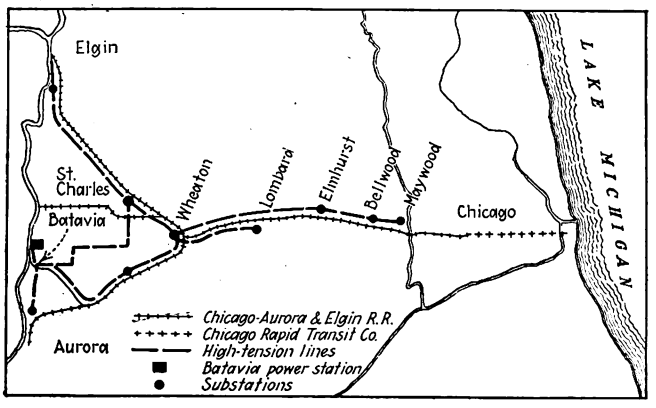
mine the feasibility of cutting down motor loads in the car shops and elsewhere on the property during the rush hours. It was found that, without any reduction in shop efficiency or in the volume of output of the shops or loss through idle labor, it was possible materially to reduce motor loads during the rush-hour periods.

Short service from Chicago to Elmhurst in the rush hours has saved 750 kw. in the demand during the peak hours, 50,000 car-miles and 2,836,000 seat-miles per annum. It has made available for use in rush hour service some ten additional coaches, thereby effecting a saving in capital investment of approximately $330,000. This service, inaugurated in August, 1923, enables several trains at the beginning of the morning and evening rush-hour periods to be doubled back to Chicago in time to permit the same equipment to be used again.



High-Tension Transmission Line Layout of the Chicago, Aurora & Elgin Railroad

Three lines from the Batavia generating station serve the entire system. At Maywood there is a tie-in with the Chicago Rapid Transit System.

DISTRIBUTION SYSTEM OVERHAULED

While track reconstruction work was being done as told in this paper March 6 the entire electrical system was given a careful inspection and defective material removed. High-tension insulators were tested, and where it was necessary they were replaced. For testing high-tension insulators Western Electric 2,200-ohm radio receiving phones were used. One end of the set was connected to a steel peg on a wooden stick, while the other was connected to ground. The steel peg was then brought up against the crossarm at the insulator pin. With the line hot, any defects in the insulator were recorded by means of a buzzing in the test set.

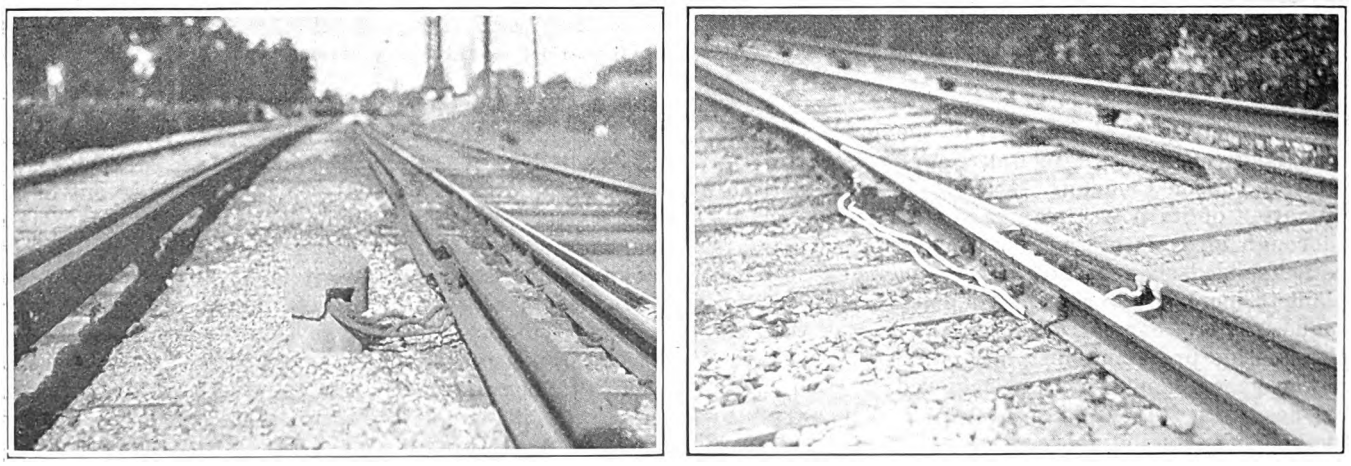
High-tension supply lines have been so planned that a dual feed is provided for all substations between Wheaton and Lombard. One side of this looped high-tension system follows the right of way from Batavia to Batavia Junction on the Aurora line and thence to Wheaton, while the other cuts across country from the power plant at Batavia to Ingalton on the Elgin line, thence to Wheaton. From Wheaton to Lombard the two lines are carried on separate poles, a line on each side of the right-of-way. At Lombard both high-tension lines are connected through the substation. One line continues to Maywood substation, just west of the city limits of Chicago. The Aurora substation is fed by means of a direct high-tension line from the Batavia power house. A substation on the Elgin branch west of Ingalton is fed by means of a line cutting through the Ingalton station.

In addition to the high-tension lines for railway purposes, the company has high-tension lines supplying many of the small villages with power and light. These lines are not interconnected with the power lines of the railway system and hence have little or no effect upon the operation of the converting substations.

Conversion of the 26,400-volt, 25-cycle, three-phase current to 600-volt d.c. for the operation of the rolling stock is accomplished in eleven substations. The location, condition, capacity and operation of these stations are given in the following table:

Location	Condition	Capacity, Kw.	Operation
Aurora	Old	1,000	Manual
Warrenville	Old	500	Automatic
Wheaton	New	1,000	Automatic
Lombard	Old	1,500	Manual
Spring Road	Portable, old	500	(Automatic load limiting) Manual
Bellwood	New	1,000	Automatic
Maywood	Old	1,500	Manual
Maywood	New	500	Manual
Ingalton	Old	1,000	Manual
Clintonville	Old	1,000	Manual
Batavia	Old	500	Manual

There is a tie-in on the d.c. side of the Maywood substation to connect with the Chicago Rapid Transit System at Forest Park. Disconnect switches and meters on the d.c. 600-volt side are located at Laramie Avenue,



Details of Electrical Distribution System on the Aurora-Elgin Line

At the left, the standard type of pothead, feeder or jumper connection to the trolley rail. The 1,500,000-circ.mil Kerite cable is incased in a concrete block and the connection between this cable and the three 500,000-circ.mil flexible bonds covered by a concrete removable cap. These bonds are fastened to the base of the trolley rail by a plug terminal. Note in this illustration the drop rail at crossovers and switchpoints to permit the trolley shoe picking up and breaking contact. This type is used in place of inclines quite extensively on the Chicago, Aurora & Elgin Railroad and has proved satisfactory.

At the right, weld terminal copper bonds are used around crossovers and frogs for return circuits.

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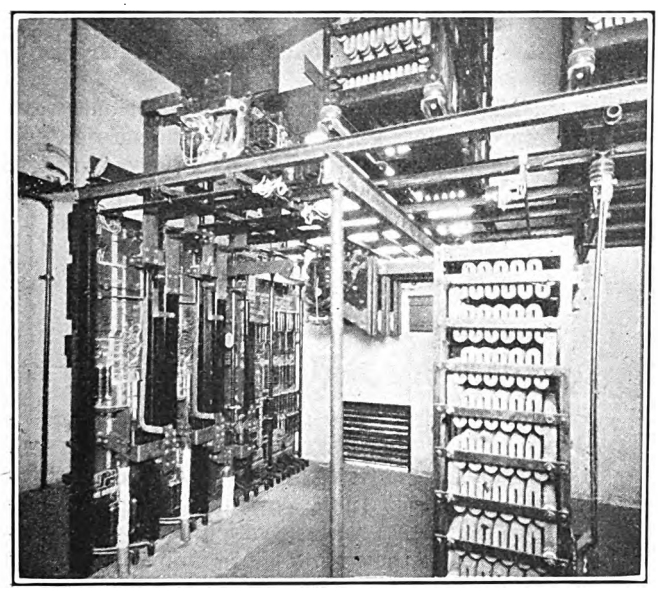
where the Chicago, Aurora & Elgin right-of-way joins the Chicago Rapid Transit right-of-way. These meters are read once a month and the Chicago Rapid Transit Company either bills or credits the Chicago, Aurora & Elgin Railroad for the amount of electricity used or delivered. Sometimes the elevated feeds the Aurora & Elgin and sometimes the Aurora & Elgin feeds the elevated due to failure or shutdowns of adjacent stations.

The new automatic substations at Bellwood and Wheaton are identical in capacity and construction, the only difference being in the feeder circuits, two d.c.



Interior of New Substation Presents a Neat and Tidy Appearance

feeders leaving the Bellwood station and three d.c. feeders leaving the Wheaton station. These feeder circuits have automatic reclosing high-speed circuit breakers. The station itself has full automatic control with General Electric Company's selector type supervisory control from the power supervisor's office at Wheaton. One 1,000-kw., interpole, six-phase, 750-r.p.m. rotary converter is supplied with power from three 350-kva., single-phase outdoor transformers. The high-tension line is cut into the station through FKO-36 oil circuit breakers, which, with the current transformers, power transformers, lightning arresters and other high-tension equipment, are mounted outside of the substation building. Lightning arresters and current transformers have been mounted on concrete piers approximately 3½ ft. high to keep this apparatus out of the snow during the winter months.

The building is of hollow tile construction with pressed brick veneer and is artistically trimmed in limestone. It has a hip roof with concrete channel slabs mounted on steel I-beams. The building is 20 ft. x 30 ft., with the average height of the roof 20 ft. above the floor. The interior of the station is finished with hard cement. An operator's desk of metal construction is located in one corner of the room.

Ventilation is accomplished through openings in the ground directly in front of the building and by two louvres, one in each end wall directly above the floor. Two 4-ft. diameter ventilators are mounted on the roof, these having enough area to take care of all of the air admitted by the openings near the floor. The two openings in front of the building connect with duct lines. One duct leads to an opening directly under the machine and the other to a register in back of the switchboard, directly under the load-limiting resistor units. The air duct to the machine may be closed off by means of a hand-operated shutter, but it is impossible to close the air line to the resistor grids. The louvres in the end walls of the building take care of the air within the building and are so arranged that they may be closed by means of hand-operated shutters.

In addition to the regular automatic equipment mounted on the switchboard, a maximum demand meter connected in the d.c. feeder circuits has been provided in order to keep an hourly record of the station output. The station is visited once a day for the purpose of collecting charge and demand tapes and inspected and cleaned weekly, at which time a report is made.

Negotiations have recently been concluded by the Aurora-Elgin company with the Public Service Company of Northern Illinois for leasing the former's power plant, transmission lines and substations for a long term of years and for the purchase from the power company of the d.c. energy used by the railroad. In addition to receiving a substantial rental for the use of its power facilities leased, the railroad secures the advantages of a large interconnected power system and the provision of its future power requirements at attractive rates for a period of years without the necessity for making any additional investment.

Wage Rates Increase Faster than Cost of Living

WHETHER or not the average wage rate has kept pace with the increased cost of living in this country is the subject of an article in the "Monthly Labor Review" for January, 1926, by Ethelbert Stewart, United States Commissioner of Labor Statistics. His position is that the wage rate has not only kept pace with the cost of living, but within recent years the increase in wages has considerably exceeded the increase in the cost of living.

To make this evident, Mr. Stewart has calculated an index figure to indicate the relative purchasing power of wages as measured in living costs, based on the ratio in 1913 as 100. From these years to 1920 the increase in the cost of living exceeded the index numbers of the rate of wages per hour, but in 1921 the rate of wages increase exceeded the rate of cost of living increase by 15 per cent, and in 1925 the increase was 37.1 per cent. The figures for 1925 cover 717,916 workers, distributed through 66 of the principal cities of the country and cover 78 trades. That the standard of living has materially increased in many of the families of these workers since 1913, the writer says, is hardly open to doubt.

The figures just quoted relate to organized labor and the average wage rate is called the "average union wage rate." To determine whether the same condition applies to labor as a whole, calculations are made of three industries—boot and shoe, woolens and cottons. In these it was found that the purchasing power of wages had increased from 25 per cent to 76 per cent, as compared with 1913.

In view of the extensive use in electric railway wage arbitration of changes of the indexes of the cost of living, these figures are interesting, and may prove valuable.

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The Readers' Forum

Annual Maintenance Number Commended

CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD
CHICAGO, ILL., March 26, 1926.

To the Editor:

I wish to congratulate you upon the Annual Maintenance Number of the JOURNAL, dated March 20. To me it is very interesting and instructive, as I am sure it will prove to all railway executives.

The subject of maintenance of track and equipment is one of first importance in the operation of a railroad. The demand of the traveling public is for speed and comfort. To satisfy that demand rolling stock and roadbed must be maintained in the highest degree of perfection attainable.

An easy riding train and a smooth roadbed are the best advertisements for any railroad. I agree with your editorial point of view that railroads in their merchandising efforts should be careful not to economize too strongly on maintenance. It is false economy, and if budgets must be cut down the paring had better be done in other directions.

It is difficult to merchandise inferior goods. Good service is impossible without good equipment and good track and roadbed. I am glad to see the JOURNAL feature so prominently the importance of maintenance.

BRITTON I. BUDD,
President.

KANSAS CITY RAILWAYS
KANSAS CITY, MO., March 27, 1926.

To the Editor:

Permit me to commend the staff of the JOURNAL for the Annual Maintenance Number of March 20, not alone for the information contained, attractive presentation and the subjects covered, but for the way in which the entire maintenance question was tied in with the broad field of transportation merchandising.

It seems to me it is most essential in trying to put the merchandising idea over that we go beyond the transportation department employees. This is about identical with training soldiers who are going to occupy the trenches without at the same time developing the same spirit in the men who furnish the ammunition, food and other supplies from the rear. It is very difficult sometimes to make the fellow greasing curves and cleaning switches understand that he is just as essential a cog in the machinery as the platform men. Every one knows the story of the fellow who tapped car wheels on the railroad for 30 years, and when called into the president's office to be congratulated for his long term of service, and was asked what he tapped wheels for, answered, "Darned if I know."

Maintenance is the very heart of the merchandising proposition, and because the men responsible for proper maintenance work behind the scenes and in a less spectacular position, they are too frequently left out of the merchandising discussions and instruction. Your entire maintenance issue is keyed along the lines of bringing home to every one the vital part that every job plays in the final selling of the finished product.

F. G. BUFFE,
General Manager.

INTERSTATE PUBLIC SERVICE COMPANY
INDIANAPOLIS, IND., March 27, 1926.

To the Editor:

I have read with a great deal of interest the Annual Maintenance Number of the ELECTRIC RAILWAY JOURNAL, dated March 20, which emphasizes the part of the maintenance men in merchandising transportation, and think this number should be read by every one interested in electric railway service.

It is a fact that unless the overhead line, track and equipment are kept in such condition that proper and de luxe service can be given the public will seek some other means of transportation. Modern equipment, well maintained, sanitary and attractive, is most essential today, if the patronage is to be attracted and firmly secured.

Your splendid efforts in stressing the various ways in which improvements may be made in the service, and economies in maintenance effected, are to be commended, as well as the manner in which the manufacturers have reflected this same thought in their advertisements.

HARRY REID,
President.

HENRY L. DOHERTY COMPANY
NEW YORK, March 27, 1926.

To the Editor:

I certainly was pleased to receive the Annual Maintenance Number of the ELECTRIC RAILWAY JOURNAL. This is one branch of our industry which I have always felt has not been given the prominence which it warrants. I feel that the publicity which your paper has given to the work of the maintenance man will be very stimulating to the best interests of the electric railway business.

F. R. COATES.

BOSTON ELEVATED RAILWAY
BOSTON, MASS., March 29, 1926.

To the Editor:

One can have no misgivings as to the fundamental soundness of the fact that railroad men have in these modern days a very vital interest in merchandising transportation. While the transportation men have the show-window problem of delivering the service courteously, with regularity and sufficient to meet all legitimate needs, the physical property with which they must accomplish this can help or harm their efforts. This condition will cultivate a greater degree of intimate cooperation between the two branches of the industry. Ill-advised maintenance economy is just as conducive to poor service as would be demoralized transportation salesmanship.

I congratulate you on the issue of March 20, 1926, and feel confident the maintenance force will appreciate your calling attention to their responsibility as well as their great opportunity.

EDWARD DANA,
General Manager.

Token Clearing House Needed

EVANSTON RAILWAY
EVANSTON, ILL., Nov. 10, 1925.

To the Editor:

If we can find some way to handle the tokens of other companies we receive in our fare boxes it will greatly help the present situation. I have tokens of other companies by the hundred, in many cases only one token of a company, while in others there are from

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one to 25 or more. It does not pay to write letters and mail these single tokens, for oftentimes the cost is as much as the few tokens are worth, regardless of the bother.

I would suggest that we start a clearing house so that once a month, or as often as necessary, I could mail or express all my foreign tokens and receive a check in return. This would have to be arranged at a set price regardless of the value of the tokens, because it would be impossible to get all companies to pay in a certain amount each year to pay for the cost of handling. I would suggest that we sell them for 5 cents each, in lots of 100. It appears to me that this proposition could best be handled in Chicago because the checks issued would be payable through a Chicago clearing house, in most cases without exchange.

I am, however, at a loss to know who would handle the matter, but if no one else will do it I will assign a clerk to the job and get it started provided you think it is the best way in which it can be done.

CHARLES F. SPEED,
Vice-President and General Manager.

Bus Rumors Grow as the Square of the Distance

MOUNT VERNON, N. Y., March 22, 1926.

To the Editor:

How prophetic were your words: ". . . with the distortion of facts likely to vary with the square of the distance" in your March 13 New York bus story entitled "Transportation Men Must Supply Facts."

Just two days ago the mail brought a letter from Ludwig Spängler, director of the Vienna Municipal Street Railways, asking what truth there was in a cable to the *Vossische Zeitung*, of Berlin, that all of New York's street railways were to be replaced by motor buses!

This reminds me of an old-time German almanac entitled "Der Hinkende Bote" or "The Limping Messenger." Doubtless the data in the almanac were soberer and more truthful than statements on like matters in the country newspapers, but the cover picture of the veteran and his crutch ineluctably lead to the thought, Lies fly, but truth limps.

If the industry wishes to escape a frightful economic waste it will have to do more than lean upon the shoulders of ELECTRIC RAILWAY JOURNAL and the press bureau of the American Electric Railway Association. Such articles as the JOURNAL'S newspaper clipping review of March 13 will justly be acclaimed as "great stuff," but please to remember that these comments will reach only a fraction of the persons who read the original newspapers.

You can't kill a dozen mosquitoes in a swarm without many a severe bite, no matter how you struggle, but you can prevent the birth of thousands with a little crude oil.

What the industry needs is not a denial campaign but an affirmation campaign. Tell the public through real "spreads" in the great magazines and newspapers where buses have proved right and where they have proved wrong; why bus fares are usually higher; how paving and other unfair burdens force railways to give less service at higher fares; and, above all, why no surface-using vehicle—street car, motor bus, taxicab, automobile or truck can refrain from obedience to the "Stop-Stop" which seems always ever so more common than the eagerly sought "Go-Go."

WALTER JACKSON.

European Rail Welding Practice

METAL & THERMIT CORPORATION
NEW YORK CITY, March 4, 1926.

To the Editor:

In the issue of ELECTRIC RAILWAY JOURNAL for Feb. 27 appears an article "Impressions of European Tramways" by James A. Emery, in which, on page 364, the following statement is made: "Heavy flat tie rods are used and no joint welding was observed, although it is understood that welding has been practiced to some extent."

A few paragraphs further down in the same article Mr. Emery particularly calls attention to the fact that, compared with American operation, the cars are almost noiseless, and gives particular credit to the track.

I realize, from the editor's statement, that the impression of Mr. Emery as outlined in this article was more or less of a hasty observation while on a pleasure trip, but in justice to those interested in rail joint welding the impression which he leaves in regard to this particular question of joints should be corrected.

The company with which I am connected has numerous affiliations abroad, and we are very familiar with the practice of joint welding in all of the foreign countries, perhaps more so than any other American organization. The information which we have is considerably at variance with that which seems to be conveyed by this article. Also, the various other articles which have appeared from time to time regarding European practice have all indicated that the standard in track construction abroad is to weld the rails with thermit. This is decidedly borne out by the data which we have.

As a matter of information on this subject, I present the following figures as to the number of thermit joints welded on the European Continent and in the British Isles. It will be noted that the period from 1915 to 1921 inclusive has been omitted, as during this period practically no trackwork was done in any of these countries during the war or immediately thereafter, and the figures would be misleading.

	Number of Thermit Joints
1912	99,800
1913	98,900
1914	96,000
1922	86,800
1923	113,300
1924	187,200

While the figures for 1925 are not available, indications from the records of the first six months are that the number of such welds will run well in excess of 200,000.

When you consider the amount of trackage abroad, it will be readily understood that this number of welded joints must necessarily constitute very close to the entire number required on paved track rehabilitation and extension work. Compared with these records of European practice, we find that in America the thermit joint was used on only about 40 per cent of the new trackage laid during 1925. This proportion has been increasing very rapidly in the last three or four years.

JOHN B. TINNON,
Manager Rail Welding Department.

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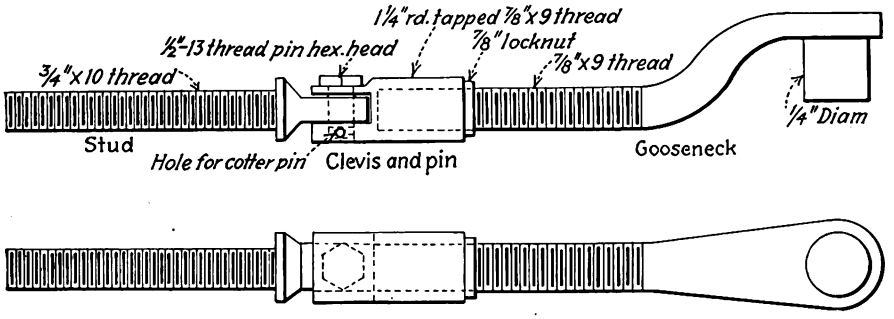
Maintenance Notes

New Connecting Rod Reduces Track Switch Failures

BY H. J. CHARTERS
Portland Electric Power Company, Portland, Ore.

CONNECTING rod troubles amounted to 30 per cent of the total switch failures during the year 1924 on the city lines of the Portland Electric Power Company, Portland, Ore. This created a considerable hazard as a broken rod left the switch point entirely free and might result in a split switch, with consequent derailment of electric cars. As the electric switches are all located at heavy traffic points, it was quite essential to prevent delays.



Connecting Rod for Electric Track Switch

To remedy this condition, a new connecting rod for the company's 23 Cheatham heavy type electric track switches has been developed and is now being installed as rapidly as traffic conditions permit. With the old type construction, the eccentric lever in the track box placed a considerable strain on the rod at the extreme positions of the switch. As a result, the threaded rods soon broke at the switch points. The threaded part was necessary in order to provide linear adjustment. This is necessary since the distance from the switch point to the lever in the track box varies at each location due to the different types of track switches that are in use. The movable connections bent the rod at each movement of the switch and caused the breaking. A scheme of allowing the rod to move slightly at the switch point end was tried, but this was unsatisfactory as the rod tended to revolve unless fastened rigidly.

With the new rod, which is now being installed, the flexible part of the mechanism is placed close to the switch point. This relieves the rod of all strain incidental to the movement of the switch and at the same time provides a means whereby the spring in the track box will keep the point tightly against the sides of the switch to which it is thrown by the magnet. The new rod seats in the track box lever, thus eliminating the link furnished in the previous construction. All wearing parts of the new rod are case hardened to minimize wear. The ½-in. clevis pin is made of chrome vanadium steel, the clevis of cold rolled steel and the stud and gooseneck are of mild steel.

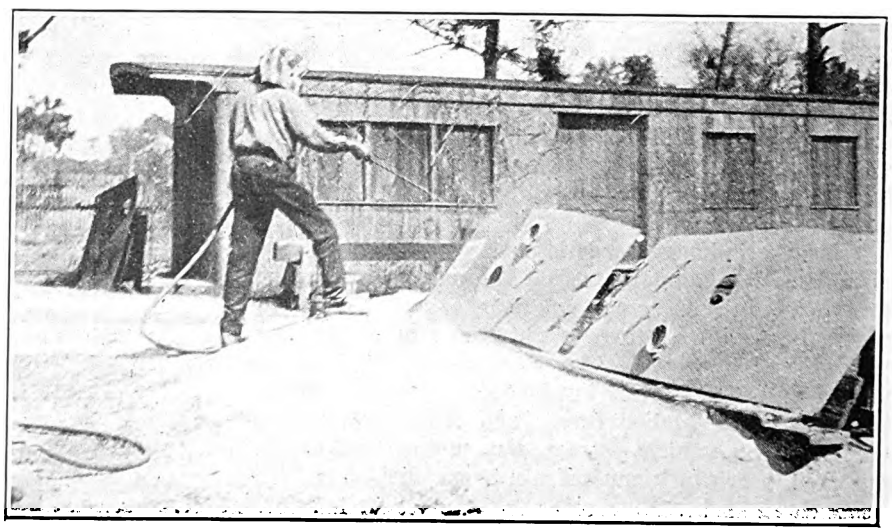
These connecting rods have been installed on Pennsylvania type and also on Buda type switch points, where traffic during rush-hour periods is the heaviest to be encountered on the system and where breakage previously has been about one rod per month. Installation in connection with the Pennsylvania switch provides a very severe test for the rod as the hole in the point of the mallet box pin is considerably nearer the heel of the switch than in other types, thus decreasing the leverage of the track lever.

The connecting rod as shown in the sketch is designed to fit any switch on the city lines, there being four types of switches in use. The stud and gooseneck were made long enough for use on the switch requiring the longest rod. To fit a rod on any other switch it is necessary merely to saw off the stud to the proper length and adjust the gooseneck by means of the threads and locknut. In the case of a very close distance between the switch point and track box lever the threaded part of the gooseneck may be sawed off on the job without any special tools.

The diameter of the clevis is determined by the size of the hole through the switch casting. In the switches used in Portland this hole is 2 in. by 2½ in. and the 1¼-in. diameter of the clevis provides plenty of clearance for free movement of the apparatus.

Removing Paint by Sand Blast

SAND BLASTING with the aid of a home-made outfit has been found very useful by the Mobile Light & Railroad Company. The compressor and supply of sand are housed in an old box car. The rubber hose pipes leading from this com-



Cleaning Dash with Sand Blast in Mobile

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pressor are about 30 ft. in length, and the sandblasting is done out of doors. The accompanying view shows the sand blast removing paint from car dashers.

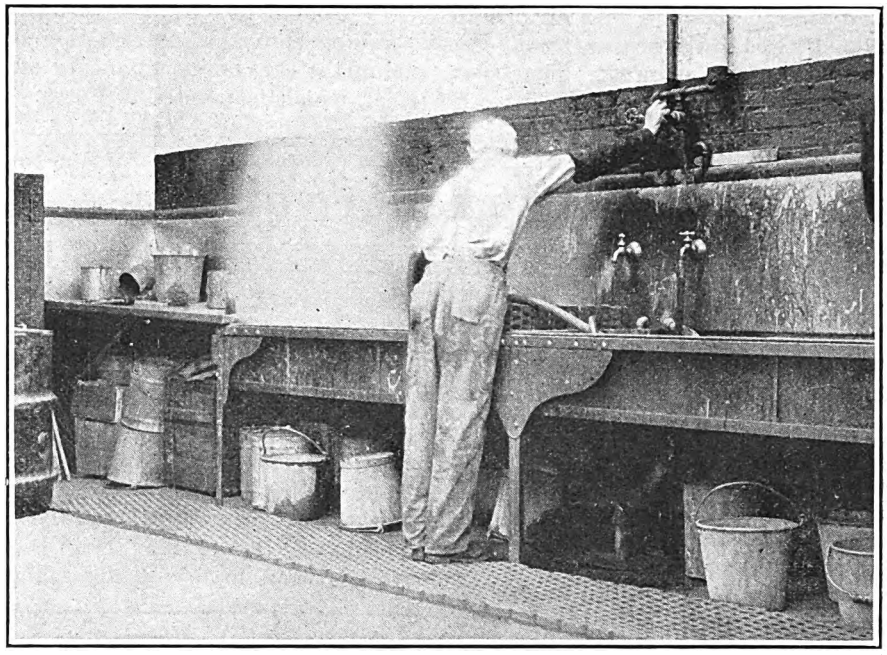
For removing paint in this way, an air pressure of from 80 to 90 lb. per square inch is used. For frosting glass, as for the car numbers on the vestibule sash, the pressure is only from 40 to 50 lb. On the Mobile cars it is the practice to frost the upper vestibule sash to the right of the motorman, as this plan is found to keep out light that might bother him.

A New Use for Old Tires

BY F. J. FOOTE
Superintendent of Motive Power and Equipment Indiana, Columbus & Eastern Traction Company, Springfield, Ohio

USE of heavy pieces of rubber as springs is not new. In fact, the writer can remember many years ago seeing a chunk of rubber 6 in. in diameter and 6 in. high that was used as one of the many truck springs on a steam road car. This rubber, however, was very hard and more like wood than rubber and could not have been very efficient as a spring.

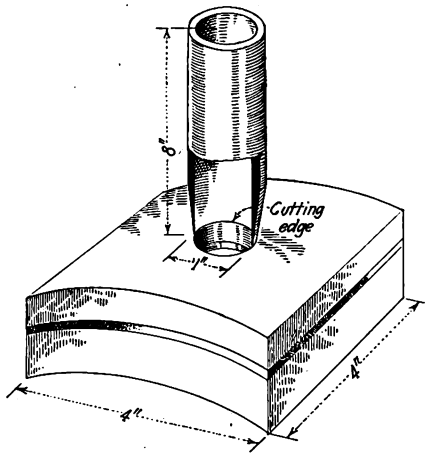
Modern methods of rubber manufacture as applied to tires have produced a product that is comparatively soft and resilient and at the same time stands an enormous amount of wear. About two years ago our company purchased some new cars on which the motors were spring suspended. These springs were about 3 in. in diameter by 3 in. long and were made of ⅝-in. steel rods. After about six months service these springs began to break, due no doubt to the hammering action of the motors on the truck. At this time our company was operating some large buses that used 38 x 7 pneumatic tires. One of these tires failed at the rim, and as the tread was but slightly worn it was cut into blocks about 4 in. square on the bandsaw, and these were strung on the safety bolts of the spring suspension in the same manner as the original springs were. Holes of 1-in. diameter were punched in the center of each block by means of a punch made from a short length of 1-in. pipe. This was pushed through the rubber by an arbor press. In placing these on the safety bolts two, three or four were used at each suspension point as was required to make the necessary length of spring.



Car Mat Cleaning by Steam and Water as Used in the Shop of the Department of Street Railways, Detroit. A Dirty Job Is Made Comparatively Simple and at the Same Time Better Results Are Obtained

These rubber washers have served the purpose of a cushion support admirably and, in fact, have given better results than the steel springs. They have now been in use about eighteen months and seem in as good condition as when first applied. The first cost was practically nothing, as the scrap value of old tires is very small.

The construction of these rubber washers is so simple that sketches seem superfluous. However, I am giving a rough sketch of a completed washer and the punch used for making the holes. A bandsaw is very efficient in cutting these tires, but it must be kept sharp. If the workman is fastidious the corners may be cut off easily or even circular washers made. The curvature, due to the shape of the tire, is not objectionable when used as a spring.



A 1-In. Pipe Is Used to Cut Washers from Old Tires

Washing Car Mats Made Easy in Detroit

CAR mats of the type used in the cars of the Department of Street Railways, Detroit, Mich., get very dirty, particularly in the winter months. A special metal-lined sink has been constructed in which the mats are placed loosely rolled together. A steam and water spray is used to clean them, as shown in the view. The steam not only furnishes pressure to force the dirt from the apertures in the mat but the heat as well aids the loosening of dirt, particularly of an oily nature. This process of cleaning requires only a few moments.

Spray Painting the Bottom of a Car

IN New Orleans it is the practice to spray paint on the under side of steel cars every time that the car goes through the paint shop. This work is done from a pit which is equipped with exhaust pipes to take away the fumes of the paint spray.

The main exhaust pipe from the exhaust fan is connected with 9-in. pipes which enter the side of the pit at a number of points. The outer end of each exhaust pipe in the pit is fitted with a slide so that only those openings near the spray painter need be open.

Before the paint is applied to the bottom of the car, the motors and other parts of the equipment are scraped so as to be free from dirt

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and are then cleaned with air. Both the bottom of the car and the equipment are painted. The color used is green.

No trouble has been experienced from any spray paint from the bottom of the car coming up on the side panel, which is painted a cream.

New Equipment Available

Prefocused Lamp and Socket

FOR use in railway signals, locomotive headlights and projectors the General Electric Company has developed a prefocused incandescent lamp and special socket. The new lamp has a special base which, when used with the socket, assures the filament of the lamp coming in exactly the same position as that of every other one of the same size and type.

Armored Cap and Cone Insulator

USE of new armored caps and spring steel lock washers developed by the Albert & J. M. Anderson Manufacturing Company is said to overcome two important installation drawbacks to the cap and cone suspension. The objections which have been overcome are the difficulty of pulling the cap up tightly without crushing the insulation and, after tightening, the frequent tendency of the cap to loosen due to the lock washer having become set and therefore ineffective.

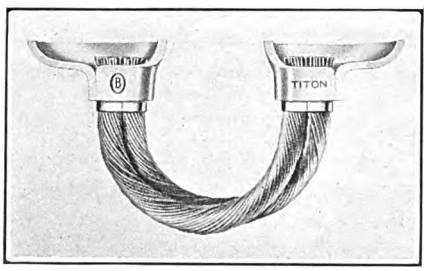
The insulation is molded into the one-piece casting of the armor, together with the steel stud. This insulation, which is stated to be high in both electrical and mechanical strength, is positively bonded to the metal and held permanently in place by fins, which are cast inside and integral with the armored caps. Separation of the insulation from the armor while the cap is being installed is therefore impossible.

It is possible to put great pressure upon the cap. The usual tongs are dispensed with, as the only tool necessary for installation is an ordinary wrench. Where the wrench is used, on the hexagonal top, the armor is the heaviest. The armor is also turned under at the extreme ends and, being metal, a very acute angle is possible; this is of considerable assistance in accelerating drip, thereby greatly minimizing creepage.

With the new hardened spring steel lock washer a positive lock is always assured. It is claimed by the makers that this washer cannot become set or lose its springiness.

Copper Arc Weld Bond

FOR attachment to the railhead by the copper metallic arc welding process, a new type of bond, known as the Titon has been developed and is now being manufactured by the Ohio Brass Company, Mansfield, Ohio. The bond is provided with terminals of heavy steel which support the molten metal as deposited and act as a mechanical protection to the finished weld. These are offset and are large enough to permit the use of an arc drawn from $\frac{3}{8}$ in. to $\frac{1}{2}$ in. without the usual danger of securing a porous or incomplete weld, since the arc is easily directed to the desired welding point. This and the use of the copper metallic arc process with copper alloy as the electrode simplifies as well as expedites installation.



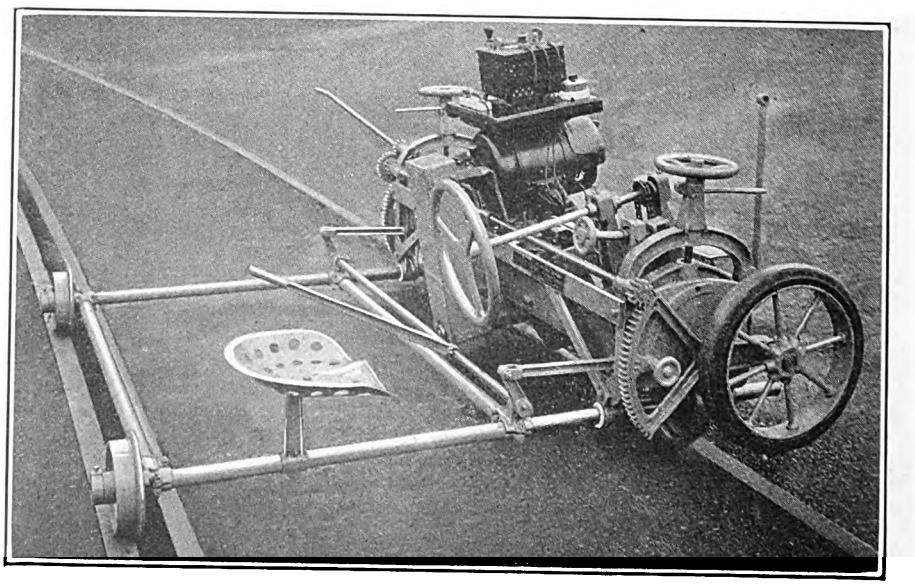
The Titon Bond Has Been Developed for Attachment by Metallic Arc Welding

It is stated that the design of the terminals and the thickness of terminal walls assist in effecting a complete homogeneous fusion of the copper strand terminals and railheads. This insures maximum conductivity and strength of the bond with a minimum use of welding material. During the past two years the Titon bond has been undergoing extensive tests under conditions of actual service.

Rail Grinder

SEVERAL improvements have been made in the Atlas Rail Grinder manufactured by the Railway Trackwork Company, Philadelphia, Pa. A tilting grinding wheel has been provided and the controlling tilting arrangement made simpler in design and more easily operated than was possible in earlier models. With the new arrangement it is necessary only to turn a small handwheel to adjust the grinding carriage to any angle of grinding which may be desired.

The method of changing grinding wheels has also been simplified. It is now necessary only to remove one nut from the emery wheel flange, thus doing away with the removal of the arbor pinion or drive chain. The present model of the grinder may be derailed merely by turning the hand-crank at one end of the machine. This lowers the derail wheels to the pavement and raises the grinder from the track. Thus 90 per cent of the weight of the machine is supported on the two roadway wheels. The operator can then lift the outrigger end of the machine and pull it off the track.



Improved Atlas Rail Grinder Embodies Several New Features

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Association News & Discussions

Co-ordinating the Bus with Existing Transportation Facilities*

Latest Methods Developed by Philadelphia Rapid Transit Company in the Operation of Gas-Electric Equipment—Gas Consumption May Be Slightly Higher for This Type of Equipment, but Is Considered Justifiable—Results So Far Show Deficits

BY R. H. HORTON
President Philadelphia Rural Transit Company

UNDOUBTEDLY the few years just past and those in the immediate future are proving the most important in the entire life of the urban transportation enterprise. We electric railway men have only recently discovered that we are not so much operators of electric railways as purveyors of transportation to the public. We have discovered that which the merchant has always known—that the public taste is fickle and changes rapidly, and that where a man wears a cotton shirt today, tomorrow he demands a silk shirt, and the man who stocks only cotton shirts to sell is lost.

Of course we must still sell electric railway transportation, for we all see many instances where nothing else can suffice, but we are awakening to the fact that many different varieties of transportation exist and the public taste for them must be met. This is particularly emphasized by the fact that in 1920 only sixteen electric railway companies were operating motor buses, while in 1925 280 railway companies were using them. So today the industry finds itself in a state of flux and with the problem before it of consolidating and co-ordinating the various methods of transportation. In Philadelphia we have subways, elevateds, street car lines, motor buses and are about to add the taxicabs. All of these should be properly co-ordinated with a view to placing at the service of the community that type of transportation which is best suited for the occasion.

Some of our transportation men view the motor bus as merely a street car on rubber tires and a purely transportation vehicle and are emphatic in the declaration that the deathknell of the rail car has sounded, while the other extreme is fully as emphatically stated by many that the motor bus is but a plaything, a fad of the moment and in a few years will be as hard to find as the old-fashioned bicycle. But is it necessary to make a determination of this question? The exact position of the automotive vehicle in the problem of transportation is to the minds of many not presently solvable, and I must confess that the more study I give to this problem the more confused I find myself becoming. The motor bus has some very definite positions between these extreme views, but the development is now in that anomalous position where the motor bus may operate more cheaply in one location and the electric car in another because of the important variable factors involved, which must be considered in each specific case under consideration.

That the bus can ever take over the entire field of transportation seems to be subject to grave doubt. That surface rail transportation will disappear in some communities seems to be a reasonable assumption. In fact, in a few very small communities it has. On the other hand, in some larger communities, where the bus has attempted to handle the entire business, including the rush-hour load, it has met with failure.

In Philadelphia we are faced with a situation that we have certain streets and boulevards upon which it would not seem to be proper, from an esthetic viewpoint, to plant rails, poles and wires. There is a demand for transportation; the motor bus is available to care for it, and hence these routes are being established. We have some territory sparsely populated and in need of development, which development will be accelerated upon the supplying of transportation. In such cases the broad interest of the community demands that the prime consideration be: Can the community as a whole afford to supply this unprofitable transportation enterprise in order that this one section of the community may benefit? In the past, with only rail lines to depend upon, such services have been difficult to provide and in many instances have proved to be too great a drain upon the community. With the motor bus at hand our task is much simpler, for with a comparatively small investment one or two buses can serve a community, with consequently a smaller amount of loss.

The congestion of our city streets is ample proof of the demand for a quicker and more comfortable kind of transportation, as well as a reflection of the fad of the day to ride on rubber. The passenger automobiles entering and leaving the central business district of Philadelphia on a typical weekday increased 177 per cent in the last six years. There are more than 100,000 additional passenger automobiles daily entering and leaving this narrow district bounded by Arch and Walnut Streets and the two rivers than there were six years ago. On an average these vehicles contain less than two passengers. Such an uneconomic use of the city's streets with the enormous expense of policing and maintaining cannot continue. We find that automobile passengers use 50.4 sq.ft. of street space per passenger in comparison with 8.2 sq.ft. per passenger for surface cars, and an estimate of 7 sq.ft. per passenger for double-deck motor buses, assuming that it is only half full on an average.

The foregoing represents more or less the reasons for the street railway com-

*Abstract of a paper delivered before the Pennsylvania Street Railway Association, Pittsburgh, March 12, 1926.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 13-16—Southwestern Public Service Association, Galveston, Tex.

April 21—Central Electric Traffic Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 21-23—American Welding Society, annual meeting, Engineering Societies Building, 29 West 39th Street, New York City.

April 23—Metropolitan Section, American Institute of Electrical Engineers, Engineering Societies Building, New York City, 8 p.m.

April 30—National Highway Traffic Association, annual meeting, Automobile Club of America, New York City.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

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pany establishing a motor bus service and placing an order for 200 vehicles in January, 1925, which was followed by another order for 160 more in January, 1926. These buses were all of the gas-electric type.

During the month of February our over-all speed has been 10.62 m.p.h.; this figure is obtained by dividing the total time the buses are on the street by the total mileage made. The average schedule speed, being the result of dividing the miles operated by the actual running time between terminals, is 12.02 m.p.h. I have not complete figures before me, but I shall be very much surprised to learn of any company that maintains an average speed as high as this, and I might also remark that in these calculations the interurban buses have been eliminated.

The maximum mileage which we have accumulated on any one vehicle is on bus No. 501, which has operated a total of 47,351 miles, commencing in August, 1925. During this period the bus has been pulled in twice: on Nov. 3, 1925, for a broken starter and on Jan. 3, 1926, for a burnt out ignition coil.

Most bus operators have established an inspection every 2,000 miles. When starting our operation here we adopted the same principle and we are now just beginning to study the refinements which will be possible. Our first step has been to increase the period of inspection in one of our garages to 4,000 miles. We have no doubt of its success. Therefore, so far as labor cost is concerned, we have cut our garage maintenance in half. We have just made this first change in our inspection period and therefore cannot give data as to its result. Inspections at intervals of 15,000 to 20,000 or even 25,000 miles do not appear to us to be an unreasonable expectation. The entire principle of inspection, however, we expect to change. We have been working with the manufacturers of electrical apparatus to develop a watt-hour meter for measuring the power output or consumption. Mileage has heretofore been used as a measure of work done, but we submit that miles are extremely variable and that 2,000 miles of operation on one route may represent far more work done than 2,000 miles of operation on another route. By the use of these meters on the buses, however, we shall have a positive index of work done. The meter has three dials, each equipped with a moving and a stationary hand. The stationary hand is set at a point representing the amount of power which may be produced or consumed before inspection is necessary. When the moving indicator coincides with the stationary one, indication is given that inspection is due.

Our accounting department will keep track of the gas consumed by each bus, the mileage operated and the kilowatt-hours used. Kilowatt-hours per gallon of gasoline should be fairly constant and definite after once being determined. The instant that a particular bus shows a reduced number of kilowatt-hours per gallon it is a definite notice that something is wrong with the engine, the generator or the driver. This indication is definite and positive. The number of kilowatt-hours per mile is not so accurate a measure, for in this instance obvious variables must be taken into consideration.

After the inspection and overhaul are completed the bus will be connected to a water rheostat and operated under test with a given quantity of gasoline, probably one gallon. In this test the engine will be gradually accelerated from idling speed and the voltage and amperage read at various revolutions per minute. This will give an index as to whether the generator is functioning properly and producing the correct amount of current at the various revolutions per minute. A more delicate watt-hour meter will be installed here and the total watt-hours for this gallon of gasoline will be determined. Thus at the close of the test, which should not consume more than fifteen minutes, we shall be able to tell whether the inspection and overhaul have put the bus in proper operating condition.

We have been operating in the city of Buffalo six six-cylinder "ZY" type Yellow Coaches which are almost duplicates of the ones operating here, except that they are equipped with a mechanical drive. During the month of October their gasoline consumption averaged 3.98, or say 4 miles per gallon, which is, let us say, 0.7 of a mile per gallon better than our expected minimum. This may be the price which we may have to pay for the advantages of the electric drive, although I am not ready to concede that until after we have made an effort to train our drivers as Buffalo has.

Fundamentally, when we are talking of gasoline consumption we are talking of costs which are about 4½ cents per mile, and when we speak of the advantages of the electric drive we mention first and foremost the high average speed, in which case we are dealing with costs of about 14½ cents a mile for wages alone. Therefore a factor which affects gasoline consumption to the extent of 10 per cent will affect costs to the extent of about 45 mills, but a factor which affects speed to the extent of 10 per cent affects costs to the extent of about 1½ cents for wages alone, and furthermore affects the fixed charges in the same ratio as well as the revenue itself.

The foregoing discussion has concerned gasoline consumption on double-deck buses. I regret that I have no figures of six-cylinder single-deck buses with which to compare our records.

Oil consumption is always a matter of concern to the operator, and in this respect our records have been not only most satisfactory but most surprising. We find the six-cylinder buses in Buffalo averaging during a month about 24 miles per quart of oil, while our gas-electric buses show an average of about 38 miles. This result is obtained because of the lesser peak of revolutions per minute on the electric drive and the lesser number of engine revolutions necessary on this type of vehicle.

Net income to date has been written with red ink, largely due, however, to the fact that we have included a large number of feeder and undeveloped lines in our operation; also that we have not been able to operate on Broad Street because of subway construction, and it is on this route that we expect our most successful operation.

This motor bus is a new development, but the same principles obtain and the greatest joy of its operation comes from the freedom with which it can be routed and rerouted, detoured or turned back, as the traffic demands.

Second Highway Safety Conference Meets

APPROXIMATELY 1,200 men and women from all parts of the country attended the three-day session in Washington, March 23-25, of the second national conference on street and highway safety called by Secretary of Commerce Hoover. The first of these conferences, which met in December, 1924, adopted as the result of numerous committee studies a program of highway traffic relief which has had a considerable influence on the development of highway traffic practice and laws in all parts of the country. The second conference proceeded from the point where the first one left off. Last spring committees were appointed which have had numerous meetings and which presented to the current conference the results of their deliberations and their recommendations.

The purposes of the two conferences have been given as follows: First, to focus public attention on the appalling increase in street and highway accidents, and, second, to develop a comprehensive program for improvement of traffic conditions and reduction of accidents upon which all concerned, including state and municipal officials and others interested, could agree. The six committees which have been working on the program were (1) uniformity of laws, rules and regulations, (2) enforcement, (3) causes of accidents, (4) metropolitan traffic facilities, (5) statistics, and (6) public relations.

The major part of the deliberations of the conference was given over to the adoption of a model motor vehicle law to serve as a general pattern for states and municipalities. The proposed measures, which include registration and title certification acts, a chauffeur license act and a code for vehicle operation, follow in the main the recommendations of the committee of experts, though changed in some minor particulars. The conference also indorsed the report of the committee on enforcement, which recommended measures of organization and procedure to secure better enforcement of the laws and regulations affecting street and highway safety, and approved the report of the committee on causes of accidents. This committee gives such information as is available as to causes of accidents and outlines a program for determining the cause of accidents with a view to their elimination.

The report most interesting to railway men was that of the committee on metropolitan traffic facilities. This report outlines a program for improvement of traffic facilities and recommends suitable plans of organization for its accomplishment. Little discussion was given to this report on the

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floor and to the report of the committee on statistics, which presented essential facts of the accident record together with its recommendations as to improvement in the collection and analysis of accident statistics.

Central Traffic Association to Hold Special Meeting

IN ACCORDANCE with the action taken at the meeting of the Central Electric Traffic Association held on March 17 and 18 a special meeting of the association will be held at the Keenan Hotel, Fort Wayne, Ind., on Wednesday, April 21, beginning at 9 a.m. This meeting is called for the purpose of conducting the regular business of the association. Being a one-day meeting, the chairmen of the various committees have been requested to call their committees together and have their reports in shape for presentation prior to the time when it is planned to assemble at Fort Wayne.

American Association News

American Executive Committee Meets

Plans for the Cleveland Convention and Various Committee Reports Filled a Busy Session—Membership of Association Increased

REPORTS on the development of plans for the coming annual convention at Cleveland, growth in membership, national relations and progress of various standing committees were made at a regular meeting of the American Electric Railway Association executive committee held at association headquarters in New York on March 26.

As chairman of the membership committee, J. H. Hanna reported an increase in company members from 733 on Jan. 29, 1926, to 736 on March 26. Individual members have increased from 932 to 1,022 during the same period. This, according to Mr. Hanna, represents an increase in individual members of 20 per cent since the present drive for this class of membership was instituted.

Chairman J. P. Barnes of the committee on subjects and meetings outlined a general program which the committee has under consideration for the Cleveland convention next fall. The procedure followed in recent years of setting aside an afternoon for the inspection of exhibits will be repeated. An evening meeting under the auspices of the Advisory Council is also planned. To conserve time and to make room on the program for speakers, committee reports will again be presented in the form of brief abstracts by the various committee chairmen. These tentative plans were approved by the executive committee.

Convention Arrangements Reported

Arrangements for the convention at Cleveland were reported by C. E. Morgan, chairman of the location committee and of the special sub-committee that was appointed at the last meeting with power to act in consummating arrangements for the convention. There will be available at Cleveland 111,000 sq.ft. of indoor exhibit space, in addition to 7,200 sq.ft. of outdoor space for working exhibits of construction equipment and 1,500 lineal feet of track space for the exhibition of cars. The indoor space will be located in the Cleveland Auditorium building and in a temporary building approximately 200 ft. x 400 ft. in gross dimensions. This temporary structure will be connected with the auditorium in a manner to put the entire exhibit in effect under one roof. There will be an 18 ft. net overhead clearance under the roof girders of the temporary building. A price of 75 cents per square foot has been established for inside or outside exhibit space. This is based on the sale of 100,000 sq.ft. A charge of $4 per lineal foot will be made for track space.

It was the opinion of the committee that handling and labor costs for setting up exhibits will be much lower than was the case last year at Atlantic City. On this basis it is expected that the total cost to exhibitors despite the increase in space rates will be less than the amounts expended at Atlantic City last year. No small part of this saving will be effected through lower hotel costs.

Cleveland Committee Organized

Cleveland hotels have underwritten more than 3,000 rooms for the period of the convention. All local arrangements will be handled by a special convention bureau appointed for the purpose. The association will deal directly with this bureau. A special hotel committee headed by Paul E. Wilson, secretary Cleveland Railways, will receive all applications for hotel reservations on special blanks which will be provided for this purpose and distributed to all those expecting to attend the convention.

The Cleveland arrangements will be handled by the following special committee: W. R. Hopkins, city manager of Cleveland; H. K. Hauk, general manager G. C. Kuhlman Car Company; G. W. Lucas, president Cleveland Frog & Crossing Company; T. E. Monks, vice-president Guardian Savings & Trust Company; W. J. Hanley, district manager General Electric Company; W. C. White, president White Motor Company; F. W. Campbell, manager railway section Westinghouse Electric & Manufacturing Company, and John J. Stanley, president Cleveland Railway. J. H. Alexander, Paul E. Wilson and S. J. Cotsworth, chairmen of the exhibit, hotel and entertainment committees, respectively, and C. E. Morgan for the executive committee will represent the association on the Cleveland committee.

Resolutions prepared by the exhibit committee to enlist the co-operation of all manufacturers in avoiding practices that would detract from the regular exhibits were read by F. C. J. Dell. These are to be put in final form and published at a later date.

In the absence of Chairman Reid, Charles L. Henry, attorney for the committee on national relations, reported on developments in Washington. Progress in the hearings on proposed legislation for the regulation of interstate bus operation was outlined. Motor truck interests were the only element reported in direct opposition to the bill.

On a rehearing before the Interstate Commerce Commission, the committee plans to test the question of the jurisdiction of the commission over the electric locomotives of independently operated electric railways. This matter has been raised by the issuance by the commission to all electric railways reporting to it of a pamphlet containing rules and instructions for inspecting and testing of locomotives other than steam.

Various other committee reports were submitted during the meeting. A recommendation by the publicity committee for a contribution of $250 to defray part of the cost of an exhibit of utility advertising at the Philadelphia meeting of the Associated Advertising Clubs of the World was approved. A convenient handbook of prepared addresses on electric railway subjects, which was prepared for the speakers' committee, was distributed among the executive committee for inspection. It is planned to add addresses on other subjects to this handbook.

James P. Barnes reported on the proceedings at the recent national conference on street and highway safety. J. W. Welsh read the report of the Accountants' Association. In the absence of Mr. Stuart, Morrell W. Gaines represented the advisory committee on electric railway financing. J. N. Shannahan commented on the excellent report which was rendered by this committee at the Atlantic City convention last fall and said that the industry is indebted to the committee for its excellent work in the preparation of its report. He said that this valuable contribution to the upbuilding of the industry would be lost unless individual companies follow the advice given in the report.

Publication of the book of railway operating practices compiled by the committee on management and operation was reported by G. C. Hecker. Members of the executive committee subscribed for several hundred copies to aid in the distribution of the book.

G. A. Richardson, chairman of the rapid transit committee reported that the committee's engineer, E. J. McIlraith, whose services were donated by the Chicago Surface Lines, has been in the field collecting the data to be used in the committee's report. G. C. Hecker, chairman of the manufacturers' engineering committee, which has been working on the preparation of recommendations for car sizes and weights to meet the requirements of average

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electric railway operating conditions, reported progress in the preparation of the committee's report. He said that this report would soon be ready for submission to the manufacturers' executive committee, when that committee, whose appointment was left in the hands of Mr. Storrs, is organized. Mr. Hecker suggested that upon completion of the report an effort be made to enlist operating companies in support of the recommendations made by the committee. H. H. Norris represented the educational committee and distributed several pamphlets that have been prepared to cover various phases of employee educational work. Demonstration of a foremen's conference similar to that recently made by Mr. Norris before the Central Electric Railway Association at Indianapolis is being considered by the program committee for the Cleveland convention.

The following were present at the meeting:

President Frank R. Coates, J. H. Hanna, B. A. Hegeman, Jr., R. P. Stevens, Charles L. Henry, C. E. Morgan, C. R. Harte, H. H. Norris representing Mr. Dana, G. A. Richardson, J. N. Shannahan, S. J. Cotsworth, E. P. Waller, J. P. Barnes, T. A. Kenny, M. B. Lambert, Morrell W. Gaines, L. H. Palmer and Managing Director L. S. Storrs, J. W. Welsh, F. C. Dell, G. C. Hecker and J. W. Colton of association headquarters.

It was decided to hold the next meeting of the committee on May 14, the location to be announced later.

Wednesday Exhibit Day—Outside Demonstrations Barred

WEDNESDAY, Oct. 6, has been set aside for inspection of exhibits at the Cleveland convention, through the following resolution passed by the executive committee of the American Electric Railway Association at its meeting held March 26:

Whereas the practice of setting aside one day during the convention week for the intensive inspection of exhibits by operating members has proved to be a general success during the two previous conventions, and

Whereas, many expressions of appreciation and other favorable comment from both railway and manufacturer members have resulted from this practice, be it

Resolved, That the executive committee in meeting assembled this 26th day of March, 1926, again votes to set aside Wednesday, Oct. 6, 1926, as a day to be devoted exclusively to exhibit inspection, and requests that no meetings of any kind be scheduled for that date.

Resolutions were also passed in disapproval of the practice of holding demonstrations of equipment away from the exhibit buildings. These resolutions follow:

Whereas certain manufacturers of automotive equipment have in past years brought buses to our conventions and parked such vehicles at advantageous points in the vicinity of prominent hotels and extended invitations to delegates to accompany their representatives on demonstration trips, and

Whereas certain other manufacturers in past years have staged exhibits in hotel rooms, and

Whereas such practices tend to defeat the purposes of the exhibition by reason of such railway delegates absenting themselves at various times from the exhibition proper and thus neglecting the study of exhibits of other manufacturers, and

Whereas the action of this committee last year in withholding its approval of such practice proved to be so satisfactory for all exhibitors at the convention, be it

Resolved, That this executive committee in meeting assembled this 26th day of March, 1926, hereby again votes to look with displeasure upon manufacturers having demonstration trips or exhibits at any place other than that designated by the association, and be it further

Resolved, That the secretary be instructed to transmit copy of this resolution to all manufacturer members and through the Cleveland convention committee, to public authorities in the city of Cleveland interested in co-operating with the association; also to the convention board of the Cleveland Chamber of Commerce and the managements of the various hotels in the city of Cleveland with the request that all of those interested lend their kindly assistance and co-operation in seeing that the spirit of this resolution is carried out.

Equipment

FOURTEEN members of the equipment committee of the American Electric Railway Engineering Association spent two busy days in Detroit, Mich., March 22 and 23. The first day was taken up by a business session held at the Book-Cadillac Hotel, and the second day was devoted to inspection trips through the River Rouge plant of the Ford Motor Company and the Highland Park shops of the Department of Street Railways. At the railway shops, in addition to demonstrations of maintenance methods an inspection was made of a large number of cars finished with cellulose lacquer systems.

Those present were P. V. C. See, chairman; W. S. Adams, W. C. Bolt, R. S. Bull, A. T. Clark, R. W. Cost, M. R. Hanna, J. M. Hipple, W. H. McAloney, J. C. McCune, R. B. Smyth, J. P. Staples, C. W. Squier and H. S. Williams.

Work decided upon for existing and new standards included two new brake-shoes for A.R.A. contours, reducing of maximum journal box width $\frac{1}{32}$ in., increasing minimum width of standard journal bearings $\frac{1}{32}$ in. and revision of demensions for journal bearing wedges and bearing and wedge gages. A new specification for wool waste was determined on.

Subject No. 2 included a study of brake equipment. J. C. McCune, chairman of the sub-committee, made recommendations for hand-brake equipment that is to be proposed for standardization, and presented a miscellaneous method and practice to cover the installation and maintenance of air brakes.

In the study of car-painting methods R. S. Bull, chairman of sub-committee No. 3, presented a preliminary report for discussion. This was revised and added to. It is to be rearranged for consideration at the next meeting of the committee. This sub-committee, along with others interested in painting, is to make an inspection in Pittsburgh on April 19 of a large number of cars that have been finished with cellulose lacquer, some of which have been in service for two years.

The sub-committee on motor coach design and maintenance outlined an inspection schedule. This is to be amplified for presentation at the next meeting of the general committee.

A progress report was presented on gearing and gages to determine when gears and pinions are worn out. The committee on desirable changes in the boiler code reported on developments that have taken place looking to a rehearing on certain points unsatisfactory to railways.

A preliminary report by H. S. Williams, chairman of the sub-committee on modernization of car equipment, brought out extended discussion. This report is to be revised and added to for presentation at the next committee meeting. This sub-committee is also making an extensive study of car lighting. R. W. Cost of the Westinghouse Lamp Company outlined various things that should be considered and reported on in this study.

Subject No. 8 includes the development of a miscellaneous method and practice on motor leads, connectors and supports. R. B. Smyth, chairman of the sub-committee, presented a progress report. Some changes were decided upon which will be made so that the final report can be presented for further consideration.

Manufacturers' Engineering Committee

A MEETING of the manufacturers' engineering committee which has been considering sizes, types and weights of cars to meet average city and interurban conditions was held at association headquarters on March 29.

Consideration was given to the draft of a report outlining the purposes and conclusions of the committee. Drawings of typical cars embodying the recommendations of the committee have been prepared. It is planned to include in the report the presentation of data from the experience of various properties showing instances of increased revenue or decreased expense resulting from the operation of improved modern cars. Another section of the report will analyze the age of electric railway equipment now in service.

New Members Elected

ELEVEN company and associate members and 98 individual members were elected at the meeting of the American executive committee held on March 26. The new company and associate members follow:

Operating Companies

Pacific Northwest Traction Company, Everett, Wash.

Wheeling Public Service Company, Wheeling, W. Va.

Associate Members

J. Rowland Bibbins, consulting engineer, Washington, D. C.

Gulick-Henderson Company, Inc., New York, N. Y.

Manufacturer Companies

The Arco Company, Cleveland, Ohio.

Dayton Rubber Manufacturing Company, Dayton, Ohio.

Doyle, Kitchen & McCormick, Inc., New York, N. Y.

Fageol Motors Company, Oakland, Cal.

Mack-International Motor Truck Corporation, New York, N. Y.

Mack Motor Truck Company, New York, N. Y.

Mack Trucks, Inc., New York, N. Y.

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The News of the Industry

Utica Fare Issue Aired

Hearing was continued on March 31 by the Public Service Commission on the petition of the Utica Lines of the New York State Railways for permission to charge a 10-cent cash fare and 7½-cent ticket fare.

The entire day was devoted to cross-examination by Milo R. Maltbie, the expert engaged by the city, of H. C. Throop, who made the appraisal of the company's property, and J. M. Joel, the auditor. Mr. Maltbie questioned both witnesses at length on their testimony.

At the opening of the hearing Warnick J. Kernan, representing the company, suggested that the petition of the company for a temporary increase in fare pending determination be held in abeyance for the present, in view of the fact that there seemed to be some doubt as to the power of the commission to grant a temporary rate under the public service commission law.

Corporation Counsel Clarence E. Williams filed with the commission on April 1 an answer to the company's petition for a temporary increase. He argued that it should not be granted until after there had been opportunity for investigation, and that if the temporary increase were granted and it were later found not justified there would be no adequate remedy to recover the increased fares paid in.

Hearings were started on March 10 by the Public Service Commission on the petition of the New York State Railways for permission to increase fares in Syracuse and vicinity to 10 cents cash and 7½ cents for ticket fares. After introduction of testimony by the company to show that the present fare did not yield an adequate return on the investment an adjournment was taken.

Public Ownership of Boston Elevated Suggested

There is considerable doubt on Beacon Hill that the proposed legislation to extend the public control of the Boston Elevated Railway, Boston, Mass., 30 years will be enacted this year. The opposition is strong and may result in reference to the next general court. Winthrop Coffins, who is one of the public trustees, is opposed to the bill. He advises the Legislature to go slow, contending that there is no urgency. The Boston Chamber of Commerce has gone on record in favor of the 30-year extension. Senator Abbott B. Rice of Newton, who is prominent in financial circles, is opposed to the bill. He has a new plan which he presents as follows:

I have always been opposed to public ownership of any business, but this is an extraordinary situation. The state is already in the street railway business, but finds some difficulty in extricating itself; then why not face the situation and make the best of it? Some one may question the above statements. So let me make it perfectly clear. Let the state take over the road by eminent domain. Pay for the road by issuing 30-year bonds on a basis of 3.8 per cent. To continue under state control the carrying charges will be more than 5½ per cent on the capital invested. By using the state's credit, about $1,800,000 is annually saved in the carrying charges on invested capital.

This amount put into a sinking fund at 4 per cent will total $105,000,000 in 30 years. If additional capital goes into the road it will have the same relative result. The sinking fund will practically retire the bond at the end of 35 years and the state will own the Elevated outright, and it will not have cost the commonwealth one dollar.

I offer this solution only as a substitute for a 30-year extension of public control. Knowing these facts, no legislator in my opinion can justify his action in voting for 30 years of state control.

There are many legislators who favor a ten-year extension of public control, provided this extension will yield annually the $1,000,000 additional capital which it is claimed the Elevated must have during the next ten or twelve years.

I suggest the following plan to go into effect as of July 1, 1926, provided that on or before that date the common stock holders agree to accept in place of the present cash dividend of 6 per cent a dividend of 4 per cent in cash and 2 per cent in new stock. The 2 per cent of stock given to the stockholders is paid for out of the fund which is at present set up from earnings to pay the 6 per cent dividend on the common stock. This gives the Elevated $475,000 a year from the sale of new stock. The trustees will have no difficulty in selling an equal amount of bonds on a basis of 5½ per cent or possibly 5 per cent. This plan provides $950,000 a year. The management claims that this new capital is to be used for rolling stock, power and shop equipment, and other miscellaneous items, which will bring about operating economies of $400,000 a year. This saving, treated as new capital, gives the Elevated more than $1,000,000 during the period of public control, and at a rate of less than 6 per cent. This solution of the Elevated problem would be fair to the car rider, to the state and to the stockholder.

The City Council of Boston, Mass., has joined the opposition to the proposed 30-year extension of the public control of the Boston Elevated Railway. The Council has voted to instruct the city law department to oppose the bill before the Massachusetts Legislature.

Competition Unlikely at Des Moines

Council Elected in Iowa City on March 29 Realizes Futility of Competitive Systems—Railway Announces Operation of Bus in Co-ordinated Service—Railway Earnings Now in Red

RE-ELECTION of a majority of the Des Moines City Council at the polls on March 29 practically assures that the Des Moines City Railway will have no bus competition in the next two years. Councilmen Mitchell, Morris and Jenney, who were all returned to the city hall for another term, were members of a Council strongly anti-bus in sentiment, and regardless of the attitude of the two new Councilmen, Fred H. Hunter and Frank Mathis, it is believed that no outside bus concern will stand a show of getting a franchise.

Officers of the Capital City Motor Coach Company, organized last fall, said that application will be made to the new Council for a permit to operate on Des Moines streets not paralleling the street car lines and on highways where car service is not available. However, this is the same organization which abandoned plans to submit its request to the former City Council several months ago after sounding out the views of the members on a similar proposal.

Announcement of F. C. Chambers, president of the traction company, that two cross-town bus lines will be established within the next 30 days, with full transfer privileges between cars and buses, is an added reason for the belief that the Council will sanction no bus service which might even tend to cripple the city railway. City officials and residents in general are of the belief that there is not room in the city for two independent transportation systems, and that no foreign company can furnish service which cannot be better provided by the traction company. A previous experience with street cars and "jitneys" is still fresh in the minds of the people.

The only cloud on the transportation horizon at present is the report that Fred Hunter, Mayor-elect, may appoint H. W. Byers corporation counsel. Byers, who held this position under a former administration, conducted a continuous attack on the railway. One of his hobbies was 5-cent fares. He insisted that the company should have stuck to that figure during the war regardless of the increase in the price of materials, labor and everything that went into traction operation. Byers' appointment would probably be the signal for a fresh onslaught on the traction company.

The railway, after seeing its stabilizing fund sink "into the red" to the extent of $73,000 first with 8 and then with 9-cent carfares, had the pleasure of reporting that the auditor's figures for February showed a balance of about $70 in the fund as of Feb. 28. Ten-cent fares, which went into effect Oct. 1, 1925, are responsible for the change.

No ruling is expected from the Iowa Supreme Court before May on the appeal of the railway from the decision of Judge Joseph Meyer of the Polk County District Court. The court held that the working agreement between the company and the union is binding as regards the clause requiring the company to keep two trainmen, a motorman and a conductor, on each car in service.

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The company maintained that such an agreement is against public policy, and prevents the company from instituting economies which would result in lower fares. The company is operating four one-man model cars, but maintains a "conductor" on each car to comply with the agreement, although the operator collects the fares.

The recent demand of the union for a 6-cent hourly increase with time and a half for Sunday and holidays was met with a flat refusal on the part of President Chambers. The traction head pointed out that granting the increase would result in increased fares or a decided reduction in service. He emphasized that the company would not go above the present 10-cent fare, neither would it curtail service below the standard demanded by the public. A conference between the union leaders and Mr. Chambers proved fruitless, and no meetings have been scheduled since.

Jamaica Central Railways Will Continue Long Island Service

Plans have been announced for continuation of service on three traction routes in Long Island which it was planned to abandon. The lines to be rescued were controlled by the Long Island Electric Railway. They are the Jamaica to Far Rockaway line; Jamaica to Belmont Park, serving Hollis, Bellaire and Queens Village, and the Jamaica to Brooklyn line, tapping the growing South Ozone Park section.

Some few weeks ago when it was learned that the Long Island Electric Railway had decided to quit service and sell the lines for scrap, Park A. Rowley, vice-president of the Bank of the Manhattan Company, traveled over the lines to establish for himself the place they hold in the growth of the Greater Jamaica district.

Following a series of conferences with H. Pushae Williams, president of the First Mortgage Guaranty Company, Long Island City, it was decided to form the Jamaica Central Railways, Inc., and application for a state charter was promptly granted at Albany, with a capital of $200,000 and Mr. Williams as president.

John H. Hanna Complimented

In transmitting to stockholders the report of the directors of the Capital Traction Company, Washington, D. C., for the year ended Dec. 31, 1925, George E. Hamilton informed them of his retirement from the office of president and paid a very fine compliment to his successor in office, John H. Hanna. Mr. Hamilton said:

> Mr. Hanna needs no introduction to the stockholders. As chief engineer, and for the last ten years as vice-president in charge of operation, he has devoted himself wholeheartedly to the service of the company, and his efforts, ability and integrity in service deserve from you that confidence and support which was so generously extended to me during my term of office.
>
> I feel that all of us can rest content in the knowledge that the onward progress of our company will be, under his administration, advanced to higher levels of useful accomplishment.

As indicated previously in the ELECTRIC RAILWAY JOURNAL Mr. Hamilton continues with the company as chairman of the executive board and as general counsel.

Taxpayers Will Carry to Court Seattle & Rainier Purchase Referendum

Certification to the City Council of Seattle, Wash., of petitions calling for a popular referendum on the purchase of the Seattle & Rainier Valley Railway by the city of Seattle will be held up until six taxpayers who are fighting the submission of the question to the city at large have an opportunity to carry their case to the State Supreme Court.

The six were given an opportunity to appeal their case before the petitions are certified when Superior Judge J. R. Ralston of Clallam County, sitting in Seattle temporarily, modified an order which dissolved a prior order forbidding City Comptroller Harry W. Carroll to certify the petitions. In modifying the order he set forth that the six plaintiffs should have a chance to ask the Supreme Court for a writ of review before the certification was made. The order of dissolution will stand, the judge said, but the clerk has been instructed not to enter it for ten days, this giving the attorneys for the taxpayers time to carry their case to the higher court.

Attacking the referendum petitions as illegal and lacking sufficient signatures, the taxpayers won a temporary order directed at Comptroller Carroll issued last January. The taxpayers' group also attacked the referendum on the ground that the bond issue by which the car lines would be purchased would not be a general obligation of the city, but rather a levy upon the municipal railway. They argued that the City Council, and not the people, was the proper authority to authorize the issue or turn it down.

Plans for Illinois Road Being Matured

Construction work may be begun soon by the Quincy & Northeastern Electric Railway on a line to run from Quincy to Monmouth, Ill. A certificate of convenience and necessity has been issued by the Illinois Commerce Commission. The route covers about 80 miles.

The new company has offices at 104 South Clark Street, Chicago. It was organized a year ago and filed its application with the Illinois commission, but the case was not reached for hearing until last fall and the commission's order has just been issued.

The company was incorporated with a capitalization of $1,200,000, consisting of 4,000 shares of preferred and 8,000 shares of common stock. The incorporators are: Charles H. Petsch, New York; E. C. Helms, New York; Charles V. Howard, Chicago; Edward D. Parmalee, Chicago, and D. E. Brainard, Chicago. Mr. Petsch is president, Mr. Brainard vice-president and Mr. Howard secretary-treasurer.

Mr. Petsch was the chief witness for the company at the hearings before the Illinois commission. The steam railroads serving the territory, principally the Chicago, Burlington & Quincy, opposed the granting of the certificate. Mr. Petsch testified that a complete survey of the proposed line had been made by Guy Lower, Chicago, who had been recommended to the company by the American Association of Engineers. The president also stated that detailed estimates of the construction costs had been made and that this would be approximately $25,000 a mile, exclusive of right-of-way, sidings, stations, etc. He estimated that the completed system, ready for operation, would cost about $3,250,000. He says that the necessary capital had been underwritten by unnamed New York interests. The preliminary work, he testified, had cost $19,042, advanced to the company by him. These expenditures included $3,500 for Mr. Petsch's personal expenses. No subscriptions for stock were to be solicited from the public along the route proposed to be served, he testified.

Mr. Petsch said that no decision had been reached as to the kind of motive power to be used. It is understood, however, that the use of electricity is being considered, with the Keokuk dam as a source of power supply.

Paving Bill in New Jersey Lost

Governor Moore of New Jersey vetoed Senator Abel's paving bill designed to relieve railway companies of paving obligations. The Legislature, on recess now until June 22, failed to repass the measure over the Governor's veto.

Rhode Island Power Companies Reach Agreement

An agreement has been reached by various electric utility interests in Rhode Island under which the way was opened in the Legislature for the creation of the United Electric Power Company to dispose of surplus energy available in the plants of the United Electric Railways, Providence. The measure, as embodied in the Peck bill, had been opposed by utilities in Providence and Newport on the ground that the retail market for electricity might be invaded by the United company under this bill, and the measure was also opposed on the score of possible outside control of local utilities resulting from the granting of wide powers to the United. Counsel for the several companies agreed, however, to the so-called Clifford bill, under which the new company will have the right to sell electricity only to railroad, street railway, electric light, power and transmission companies. A certificate of public necessity will be required before the company can sell electricity at retail.

Indianapolis to Convert 100 Cars

Plans are being developed by the Indianapolis Street Railway, Indianapolis, Ind., to convert 100 semi-obsolete cars into modern carriers. In addition, it is probable that considerable extensions of bus lines will be undertaken, as well as the completion of the bus station at the traction terminal. Conversion of the cars is expected to cost approximately $250,000. Bus development in 1925 cost $200,000, and it is reported that the expenditure on this part of the company's service will in all probability be doubled this year.

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Final Hearing on Cleveland Grant Expected on April 5

Cleveland's City Council at its meeting on Monday evening, April 5, is expected to dispose of all proposed amendments to the existing franchise ordinance of the Cleveland Railway.

One of the amendments proposed, which has been before the committee on street railways of the City Council for consideration, would include in the general amending franchise a provision affecting the relations between the company and its employees. The company has stated that it will decline the grant if such an amendment is included. The city law department has rendered an opinion sustaining the position of the company that such a provision has no place in a franchise contract.

W. G. Lee, president of the Brotherhood of Railroad Trainmen, in an interview, gave as his opinion, based on his 30 years official connection with the brotherhood, that any such provision should not be in the contract.

The Council committee on street railways has been considering changes in the railway grant since July of last year. Extended reference will be found on page 589 of this issue of the ELECTRIC RAILWAY JOURNAL to suggestions made regarding readjustments in the terms of the grant.

Coral Gables Rapid Transit Line Scheduled for Operation in April

One of the finest interurban rapid transit systems in America, linking Coral Gables, the "Baby City" of the United States, with downtown Miami, Fla., is finished as far as track laying is concerned. It is expected that next month the system will be in operation delivering passengers from Coral Gables to Flagler Street in Miami in twelve minutes. To this end, F. W. Webster, vice-president and executive manager of the Coral Gables Corporation, as noted previously in the ELECTRIC RAILWAY JOURNAL, placed an order with the St. Louis Car Company for nine de luxe type vehicles. When these cars are delivered at Coral Gables the transportation facilities of the George E. Merrick development will rank among the most modern and luxurious in the world.

The start of the Coral Gables Rapid Transit system marks more than an ordinary rapid city development and an engineering achievement. Four years ago Coral Gables was still a fruit grove, "so far from the city of Miami that nobody will settle there." George Merrick, its founder, visualized what the city was destined to become and decided in his mind the routes of the systems of communication which play so essential a part in any great city or suburban development. Its systems of rapid transit designed and already in operation are fully in keeping with the high standard set by the other factors in the development.

With the rapid transit line, the Flagler Street line, the new station on the Florida East Coast Railroad and the Coral Gables bus system, the city of Coral Gables will shortly be provided with ample transport facilities. In addition to these four systems, the industrial waterway and other arms of the Coral Gables canal network will shortly be in operation, and it is expected that these will carry a large amount of both freight and pleasure craft traffic.

It is after all a mighty significant thing that the installation of an electric railway was regarded as essential to the maturity of the plans for the development of this unusual community undertaking.

Commission Changes in New York

Proposed Departmental Reorganization Will Give Governor Added Power of Removal—Minority Leaders Charge Transit Commission Would Become Merely a Bureau in Department of Public Service Under Plan Suggested

AT THE general election in 1925 the people of the State of New York approved an amendment to the state constitution providing that the 150 or more departments, divisions and bureaus of government should be reorganized into not to exceed twenty civil divisions.

A non-partisan committee, under the chairmanship of Charles Evans Hughes, former Governor of New York State and ex-United States Supreme Court Justice, spent many months mapping out a general plan of reorganization. This plan, as submitted to the Legislature, provides for the ultimate grouping of the civil functions of government into eighteen departments.

The department of public service is to be formed by the consolidation under one administrative head of the present Public Service Commission and the Transit Commission. At present the Transit Commission regulates transit in New York City only, while the Public Service Commission deals with the regulation of other public utilities throughout the state.

The chapter or article dealing with the public service department arranges the organization into two branches or divisions:

The state division, the head of which shall be the present Public Service Commission, consisting of five members, to continue to be appointed for terms of ten years each and to receive an annual salary of $15,000.

The metropolitan division, the head of which shall be the present Transit Commission, or its successors, to consist of three members to serve for nine years each.

As the terms of office of the present transit commissioners all expire on April 16, 1926, and their terms of office are now fixed at five years each, an amendment to the public service commission law has been presented to the Legislature to take effect April 15, providing that the terms of office shall be nine years and that the members shall be so appointed that the term of one will expire at the end of each three years.

Members of both the Public Service Commission (the state division of the new body) and the Transit Commission (the metropolitan division of the new body) are to be appointed by the Governor, by and with the advice and consent of the Senate.

Practically the only change effected by the reorganization is in the term of office of the transit commissioners and the additional removal power vested in the Governor in relation to members of the Public Service Commission. He now has the right to remove a member of the Transit Commission on charges and an opportunity to be heard. In 1921, however, the law was so fixed that a member of the Public Service Commission could be removed only on a two-thirds vote of the Legislature in the same manner as judges are impeached. This privilege was deemed by the Hughes committee to be out of all proportion to the emoluments of the office, so under the provisions of the law creating the new department of public service, the Governor is accorded the right of removal of both the public service commissioners and the transit commissioners, on charges and the right to be heard.

All of the functions, powers and duties and employees of the present Public Service Commission and of the Transit Commission will, when the reorganized plan goes into effect, Jan. 1, 1927, be transferred bodily into the newly created department.

Charging that the Hughes reorganization commission and the Republican leaders have sought to play politics with the transit situation in New York State, Minority Leaders Bernard Downing and Maurice Bloch of the Senate and Assembly have introduced bills to preserve to the city of New York the right to regulate its own transit problems.

One of the measures abolishes outright the present Transit Commission and transfers all of its powers, functions, jurisdiction, appropriations and employees to the Board of Transportation. The other bill transfers all of the powers, duties, functions and employees of the Transit Commission to the Board of Transportation, but does not abolish the Transit Commission itself.

The passage of either bill would give to the Board of Transportation the right to issue permits for the operation of bus lines without going to the Public Service Commission for approval.

Fares in Baltimore an Election Issue

Electric railway fares in Baltimore have been brought into a campaign being waged for the Democratic gubernatorial nomination in Maryland. Gov. Albert C. Ritchie is a candidate for renomination and William Milnes Maloy also is seeking the support of the party. Mr. Maloy is a former chairman of the Maryland Public Service Commission and also served as people's counsel. In his campaign addresses Mr. Maloy is promising, if nominated and elected, to seek lower car fare rates in Baltimore.

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Twenty-two Miles Abandoned in New York State

With the approval of the Public Service Commission the Chautauqua Traction Company on March 22 abandoned 22 miles of trackage between Ashville and Mayville, N. Y. The route has been in operation for 23 years, running for some years at a loss. Service between Mayville and Westfield was abandoned last year.

The West Ridge Transportation Company the day after the discontinuance extended its bus line, which has been operating for some time between Westfield and Mayville, to Chautauqua. In addition, the Jamestown Street Railway has started service between Jamestown and Ashville via Celoron and Beechwood. One-man cars will be operated between Jamestown and Ashville as on all the other lines of the Jamestown Street Railway, affiliated with the Chautauqua Traction Company. Buses have been carrying the school children of the Chautauqua school district along the route between Ashville and Chautauqua since March 15. They are operated under contract with the School Board by C. L. Gorman of Ashville.

Holiday Pass Plan Under Consideration in Cincinnati

The Cincinnati Street Railway, Cincinnati, Ohio, has under consideration a proposal to adopt the holiday ticket plan, which is now in vogue in Pittsburgh, Pa. Walter A. Draper, president of the railway, said that he had been watching the Pittsburgh experiment with interest. Recently Mr. Draper received a letter from the Federated Civic Association advocating the adoption of the plan. The association contends that it would serve to introduce more friendly relations between the company and car rider and stimulate business during the lean hours. Whether the Cincinnati company will adopt the Pittsburgh plan in its entirety has not been determined. In that city the railway company sells the tickets for 25 cents, good all day and usable as often on the holiday as bearer wishes.

Connecticut Men May Ask More Pay

Employees of the Connecticut Company, New Haven, Conn., are said to be planning to repeat their petition to the company for the same scale of wages and the working conditions asked last June, a request that was rejected by the board of arbitration called upon to settle the differences between the company and the employees.

The state conference board of the employees' organization has voted to submit the proposed form of agreement to the company in April rather than in June as has been the custom. This will enable hearings to start early and have the question settled before the present contract agreement with the company expires in June.

The proposals to be made to the company are based on an eight-hour day, and provides for the following schedule over a period of one year: the first three months, 70 cents an hour; the next nine months, 72 cents an hour, and thereafter, 75 cents an hour.

The rates now in force provide 53 cents, 56 cents and 60 cents for the operators of two-man cars, with a 7-cent differential for operators of one-man cars, for the same periods during one year.

One-Man Car Case at Dayton Appealed

Appeal has been made from the decree of United States Judge Smith Hickenlooper at Cincinnati, Ohio, enjoining the city of Dayton from enforcing against the City Railway and others the provisions of an ordinance passed by the Dayton City Commission requiring the street railways to operate cars with two men. The decree was entered in the suit of the City Railway and others against the city of Dayton.

The plaintiffs alleged that after the city had passed an ordinance providing for one-man cars and the railways had complied with the provisions, a referendum election was held directing repeal of the permissive legislation and the passage of an ordinance requiring the companies to operate two-man cars and that the effect of this was to deprive the companies of property without due process of law and to infringe upon their contractual rights under the original ordinance.

The city of Dayton in its appeal alleges that Judge Hickenlooper erred in holding that the second ordinance infringed upon the rights of the city railways. It asks the Appellate Court to reverse the decree entered by the court below.

Appeal on Electrification Ordinance in Buffalo

The Buffalo, N. Y., City Council has taken an appeal from the decision of Supreme Court Justice Crosby, who held that the railroad electrification ordinance is invalid. The ordinance does not require the railroad lines entering the city to electrify their roads, but prohibits the use of steam locomotives. Railroads fighting the ordinance say electrification of their lines in the city of Buffalo would be forced upon them if steam locomotives were prohibited. The cost of such electrification, the railroad interests say, would exceed $100,000,000. The case will be argued before the Appellate Division at the spring term. The city may appeal to the New York State Court of Appeals and the Supreme Court, if necessary, to test the validity of the measure.

Artists, Sharpen Your Pencils

Any artist residing in the United States has the opportunity to make a cover to be reproduced in the Sesqui-Centennial number of the "Traveler," published by the Philadelphia Rapid Transit Company, Philadelphia, Pa. The most suitable design carries with it a prize of $500. The design can be either descriptive or pictorial and must possess some theme suggestive of the spirit of city transportation in the year of the Sesqui-Centennial Exposition.

J. Rowland Bibbins Retained in Philadelphia

Mayor Kendrick of Philadelphia has retained J. Rowland Bibbins, Washington, to aid the city in negotiating an operating lease of the Broad Street subway with the Philadelphia Rapid Transit Company. The Mayor made the announcement public along with a communication to Thomas E. Mitten of the railway.

Mr. Bibbins aided the city in its investigation of the transit company's books when it prosecuted a protest against the 8-cent fare, two tokens for 15 cents, before the Public Service Commission.

Mr. Mitten's statement regarding the subway lease was sent to Mayor Kendrick several weeks ago. In it he left an impression he expected to obtain the free use of the subway. In his reply the Mayor said:

> I am still convinced that a proper and satisfactory lease cannot be brought about by public statements or exchange of written communications made in advance of conference table discussion and negotiations.

Associates of Randal Morgan in Indianapolis Mourn His Passing

News of the death of Randal Morgan was received in Indianapolis as a distinct shock. He took a financial interest in the Indianapolis Street Railway in 1899 when he became associated with Philip J. McGowan. This business relation continued until Mr. McGowan's death in 1911. Mr. Morgan was interested in the erection of the Indianapolis Traction Terminal station in 1902. He and his associates then started on a wide scale to develop interurban lines in Indiana. He became interested in the Union Traction Company and the Terre Haute, Indianapolis & Eastern Traction Company. His last visit to Indianapolis was about two years ago. Robert I. Todd, president of the Indianapolis Street Railway, and Joseph A. McGowan, secretary of the company, both issued statements about the death of Mr. Morgan in which they mourned the loss of a friend and business associate.

New York Urged to Abandon Operation of Projected Subways

Mayor Walker of New York has been requested to stop the letting of contracts for the new municipal subway system now under construction by the city and intended to be run by the city in accordance with plans made by former Mayor Hylan. The protestant is the Civic Council of Brooklyn, composed of 96 organizations in that borough. The council wants the Mayor to open negotiations with the Brooklyn-Manhattan Transit Corporation and the Interborough Rapid Transit Company for the operation of the new lines. It suggests that if this is to be done the routing of the new lines into Brooklyn and Queens will have to be changed so that the new system will be connected with and at certain points merged with the existing lines. It also urges that the private companies can probably be induced to equip the new lines if the administration will abandon its plan for municipal operation.

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News Notes

Railway Man Honored—Hotel Lowry, named for Horace Lowry, president of the Twin City Rapid Transit Company, is to be erected at a cost of $1,250,000 by the Arcade Investment Company of Minneapolis at Fourth and Wabasha Streets, St. Paul, by 1927. Mr. Lowry is head of the Arcade company, which already operates the large Lowry office building in the same block.

Front-Entrance Plan for St. Louis.—United Railways, St. Louis, Mo., has altered the seating arrangement of 150 cars, to provide operation of the cars under a front-entrance rear-exit plan. The aisles have been widened to facilitate the movement of passengers from the front to the rear of the cars. A longitudinal side seat extending half the length of the car is placed on the right of the front end and a similar seat on the left side at the rear. The regular crosswise seats are maintained on the sides of the car not thus rearranged.

Commission Approves Reduced Baltimore Rates.—A voluntary reduction in some of the rates between Baltimore and Annapolis has been made by the Washington, Baltimore & Annapolis Electric Railroad. The new rates have been filed with the Maryland Public Service Commission and approved by that body. The company reduces the round-trip rates if bought in books of five or ten. The present rate is 90 cents one way or $1.68 round trip. Under the old rates five round trips cost $8.40 and for ten round trips the cost was $16.80. But under the new rates books of five round trips are sold for $7.40, a saving of $1, and books of ten at $14.10, a saving of $2.70. The new tickets are good three months from date of purchase.

Fare Schedule Approved.—The Public Service Commission has approved the passenger service schedule of the New York, Westchester & Boston Railroad on its newly constructed line extending from Larchmont Gardens (Mamaroneck) to Mamaroneck. It has also approved one-way, 46-trip and 60-trip ticket fares provided for transportation between points on the new line and other local points.

Hearing Set on Fare Petition.—The Fresno Traction Company, Fresno, Cal., has applied to the Railroad Commission for an increase in its fares, alleging that it had an operating loss of $4,056 during 1925 as the result of its first year's operation under its resettlement franchise. The present fare is 6 cents. The commission has set the application for hearing before Commissioner Harley W. Brundige at Fresno June 1, when the complaint of the city of Fresno to require the utility to extend its tracks to the Fink-Smith tract will be heard.

Fare Increase in Elkhart Indicated.—John McCardle, chairman of the Indiana Public Service Commission, after a hearing, indicated recently the commission would grant the petition of the Chicago, South Bend & Northern Indiana Railroad to raise its local fare in Elkhart, Ind., from 5 to 7 cents. Statistics were presented to show the company operated at Elkhart last year at a net loss of $10,000, including interest on the capital invested. No objection was made to the petition at the hearing.

Seeks Relief from Resurfacing Costs.—The Wheeling Traction Company, Wheeling, W. Va., has submitted a proposal to the Wellsburg Council looking toward relief of paving costs on Charles Street and the discontinuance of the railway on that thoroughfare. It was a counter proposal and in answer to the proposal which the Wellsburg Council submitted to the traction officials several days ago asking that they pay for seven-thirtieths of the cost of resurfacing the principal street. The first proposition offered by the Wheeling Traction Company was to discontinue its Charles Street line and substitute a bus service. Included in the recent proposition of the traction company was the clause that the company would pour a concrete foundation between the rails and ties to within 2 in. of the surface and that it would weld all the rails.

Group Insurance in Baltimore.—The United Railways & Electric Company, Baltimore, Md., has taken out group insurance on its 5,000 employees, the total amount being $5,000,000. In carrying out the plan the United will pay a part of the premium and the remainder will be paid by the employees. It has been announced, however, that until the employees signify their intention to participate in the plan the entire premium will be paid by the company. Each employee, under the plan, will be insured for $1,000. About 50 per cent of the employees are engaged in occupations that would make it difficult for them to obtain insurance under ordinary circumstances. Neither the pension plan nor the company insurance plan is affected by the new insurance, in which all executives and officials may participate.

Foreign News

Further Electrification in Java Planned

Electrification of the Manggarai-Buitenzorg railway line in Java, Dutch East Indies, has been sanctioned by the government, according to recent reports. Plans for the project are now completed, execution of the work has already been commenced and the necessary material will be ordered soon. It is expected that the electrification of the entire line will be completed in two years. An appropriation of about $40,000 has been made for preliminary work in connection with the electrification of the Poerwakarta-Bandoeng line, which may be electrified next.

Power Station of London Underground Extended

Extensions of London's underground electric railways are necessitating additions to the plant in the power station at Lots Road, Chelsea. This station, one of the largest in Great Britain, contains seven turbo-alternators of 6,000 kw. each and three of 15,000 kw. each. A fourth 15,000-kw. machine is now under construction, and when this is completed the generating capacity of the power station will be 102,000 kw.

The steam generating plant comprises 64 boilers, each capable of producing 16,000 lb. of steam an hour at a pressure of about 200 lb., and eight boilers each having a capacity of 40,000 lb. an hour. Two boilers of about 50,000 lb. an hour capacity are under construction and will be put in operation during the present year.

The present maximum load on the power station is about 70,000 kw. It is estimated that in five years time the total demand will be about 100,000 kw. To provide for this additional load it is planned to install large turbo-alternators of 15,000 kw. each in place of the existing machines of 6,000 kw. each. All the new turbines are designed so that they can at a later date operate with steam at 275 lb., at which pressure all the new boilers will be capable of working. By operating at the higher steam pressure reductions in coal consumption will be effected.

The amount of coal burned at Lots Road during 1925 was about 264,650 tons, this being at the rate of about 2 lb. per kilowatt-hour delivered.

Underground Extension Opened in Spain.—In Madrid, Spain, was completed and opened for traffic recently the Sol Quevado section of the Alphonse XIII underground electric railway. This line is an extension of the Sol-Venta section, the two forming a railway which runs from the east to the west of the city, a distance of nearly 4 miles.

Municipality May Buy Tramway Undertaking.—It was decided recently by the City Council of Newcastle-on-Tyne, England, to purchase the Tyneside Tramways & Tramroads Company at a cost of £96,000. The deal is subject to the Council obtaining Parliamentary power to operate the company's lines. The Tyneside company's tramway lines comprise about 11 miles of track, while those of the Newcastle corporation are about 35 miles. If the purchase is consummated it is expected that the two systems will be co-ordinated.

Subway to Be Constructed at Milan, Italy.—Definite plans for the construction of a subway in Milan, Italy, have been under discussion for some time. Two routes having the approximate lengths of 3.8 miles and 3.6 miles are planned. The total cost of the project is estimated at $8,000,000. In granting the concession, preference will be given to the group which offers not only the most favorable financial conditions but also the greatest frequency of trains.

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Recent Bus Developments

Bus Operated Over Former Railway Route in Pennsylvania

Application was made on March 25 to the Public Service Commission by the North Branch Bus Company, a new concern, for a certificate to operate bus lines over routes formerly served by the North Branch Transit Company, Bloomsburg, Pa. Trolley service was suspended on that line on March 2, and a bus service was started by Douglas Ford, formerly connected with the management of the railway. This railway system of 26 miles was bought by the Hazleton Auto-Bus Company at a recent sale. The North Branch Transit Company succeeded the Columbia & Montour Electric Railway in 1911. The line was placed in receiver's hands in 1915.

Oklahoma Railway Fights Competition

Receivers for the Oklahoma Railway on March 25 applied in the federal court in Oklahoma City, Okla., for an order to restrain the People's Transit Company from operating jitneys and buses on the streets of Oklahoma City in competition with the railway. For several weeks the People's Transit Company has been operating several jitneys on the streets of Oklahoma City. It recently secured an injunction in the district court restraining the city authorities from enforcing an ordinance which requires a license fee of $15 a year for each seat in a bus or jitney operated for hire, and prohibits buses from operating on streets where there are street car lines or within two blocks thereof. The ordinance was held invalid by the court. The railway is throwing the matter in the federal court on the grounds that the receivers of the company are officers of the court; that the court also has control of the railway property and should protect it against destructive competition.

As a further means of meeting the jitney situation the Oklahoma Railway began operation, on March 26, of a new bus line which will be in direct competition with cars operated by the People's Transit Company on East Tenth Street. The new line runs from the business section north on Robinson to Broadway Circle and east on Park Place, which is one block south of Tenth Street.

Hearings Held on Bus Bill

Committee of Congress Goes Into Executive Session to Consider Future of Cummings Measure, Designed to Place Interstate Bus and Truck Carriers Under Federal Jurisdiction

HEARINGS on the bill to place interstate bus and truck traffic under the jurisdiction of a federal body were adjourned in Washington on March 29. They may be reopened, but opinion in administration circles appears to be that the Cummings measure is lost for the time being, if not for all time.

At the last session highway interests and the motor haulage people stressed the point that the interstate business was accidental due to the geographical location of industry. To all practical purposes the extent of this traffic was nil compared with the country's total highway tonnage. Counsel for the steam railroads were primed to present their case, but the committee decided to go into executive session before hearing this appeal. That in itself might be considered a bad omen for the progress of the bill.

Provisions of the proposed bill have been heralded far and wide. Still it will do no harm to recapitulate some of the salient points. They follow:

> The bill divides the motor carriers into two main classes. Class A covers carriers operating between fixed termini or over a regular route and Class B the so-called irregular carrier. Under the terms of the bill the state regulatory bodies, acting with concurrent jurisdiction, hear and grant certificates of public convenience and necessity after having given "reasonable consideration, among other pertinent matters, to available transportation service by railroad, or other existing transportation agency; to the character of service to be rendered by the applicant; to the likelihood of the proposed service being adequate, permanent and continuous, and to the effect which such service may have upon any other transportation agency, the continued operation of which is important to the community." Appeal to the Interstate Commerce Commission is provided in case of disagreement between states on a certified record made before the state or joint boards.

Very brief summaries of the testimony on March 22-25 were published in the ELECTRIC RAILWAY JOURNAL for March 27, page 567. Representatives of the electric railways had their inning on the third day. Mr. Storrs said that the electric railways were in accord for the bill, but that if any amendments were presented "we want to reserve the right to speak or file a brief." Among other things he said:

> None can successfully assail the wisdom of government regulation of common carriers, whether local or national in character. Passenger carrying motor vehicles are now under regulation locally in 39 states, while rail lines are universally regulated by the states and nationally. Where engaged in interstate business, they are under regulation similar to that of the steam carriers. We believe that there should be the same regulations for all common carriers. To ask this Congress to permit one class of carriers to proceed unregulated while others are subjected to regulations would be equivalent to setting up a special class. This is contrary to every theory of our government, and I am sure it does not for a single instant meet with the approval of any member of this committee.
>
> The decision of the Supreme Court on March 5, 1925, to the effect that states could not prohibit the operation of interstate motor carriers did much to destroy the efficiency of local transportation.
>
> In so far as this bill relates to the motor truck situation, there has been much false propaganda spread about it. It has been repeatedly stated that if this bill became effective no truck could cross a state line without first having obtained a certificate of convenience and necessity. The fact is that under the provisions of this bill only a small part of the motor truck industry would be affected. That part would be only the common carrier vehicle.
>
> I wish to emphasize particularly, however, the fact that there are now in operation many motor routes which give an essential public service, and these need protection from unregulated competition fully as much as if not more than the rail carriers. The public served by all essential agencies should have assurance that this service may become permanent through fair regulation and reasonable protection.

Among others who spoke on behalf of the electric railways were Dudley Farrand, A. R. Williams and C. B. Hammond. Each of these men told about the need for regulation as he saw it. In order to give an idea of the extent of interstate service by companies operating in territory served by his company Mr. Farrand pointed out that since the latter part of the summer of 1925 fifty-four companies or individuals had taken up this class of transportation service. These operators had 200 buses and covered a total of 2,525 route-miles. Their lines extended not only to New York but to Pennsylvania, with some lines running from Philadelphia to New York. Of this number there now survive 39 routes that total 1,716 miles on which 153 buses are operated.

Further, he said:

> An actual count taken at the ferries between New York City and the Jersey side for a typical day shows that 717 bus trips were operated between New York City and New Jersey points, carrying 6,222 passengers. The average fare of these passengers is approximately 75 cents each, so that the revenue received by these buses a day is approximately $4,700. This means an annual revenue approximating $1,750,000.
>
> Up to the present time interstate bus service between New Jersey and either New York or Philadelphia has been dependent upon the use of ferries, crossing the Hudson or Delaware River, to reach their metropolitan terminals. On July 4 of this year the new Philadelphia-Camden Delaware River bridge will be open for traffic. The vehicular tunnel connecting Jersey City with New York City will likewise be opened for traffic during 1927. The imminence of the availability of these two facilities makes even more necessary the immediate proper regulation of the interstate motor carrier.

Mr. Williams stated there were 146 buses doing interstate business out of Providence over 57 routes. Between Woonsocket and Blackstone there are 32 buses doing the business formerly carried on by a railway line.

The case for the bus men, or at least for the group included in the Bus Division of the American Automobile Association, was presented on March 25 by S. A. Markel, chairman of the Bus Division's legislative committee. In urging the immediate passage of the bill, Mr. Markel said that 38 states are now functioning under regulatory measures. Some of these have had regulation for ten or more years, giving the state commissions ample opportunity to assemble such facts and data as to enable them properly and constructively to regulate motor carriers. There was plenty of experience, he indicated, to warrant the belief that state commissions would function satisfactorily under interstate regulation. The Bus Division had no special interest in trucks, if in the wisdom of the committee it seemed desirable to separate the two forms of regulation.

Mr. Markel then presented a number of amendments. Many of these were merely to clarify the text, but one was intended to be retroactive to permit all operators who on March 3 were giving service to continue doing so.

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Another Hearing on Reading's Appeal

Additional evidence in support of the Reading Railroad's application for permission to operate buses between Jenkintown and Wyncote, Montgomery County, and New Hope, Bucks County, in Pennsylvania, was submitted on March 26 to Public Service Commissioner Benn. The matter under consideration was one of several applications which the Reading Company intends to substitute for train service on its branch lines.

Protests were filed by the Philadelphia Rapid Transit Company, the Philadelphia Rural Transit Company, Warwick Township, the Reading Transit Company and individuals who possess certificates to operate buses in that section of the state.

The most important witness examined was E. D. Osterhout, passenger traffic manager of the Reading System. He said that in the last five years the passenger traffic on the suburban trains had decreased 30 per cent, due in a large measure to the individual operation of automobiles. The commutation service, however, had increased, due to the building operations in the vicinity of Willow Grove and at other points.

Officials of the company, considering the falling off in business, decided to withdraw these poorly patronized trains and substitute buses.

Another hearing will be held.

A Remedy Prescribed for Traffic Ills

Curing the ills of traffic congestion does not call for the elimination of the trolley car, according to an article by Carl Parker, manager of sales, bus division, Reo Motor Car Company, which appeared in the Indianapolis *Star* on Feb. 21, but it does call for the skip-stop plan in the majority of American cities. Skipping not just one intersection, but in some cases as many as five to ten, was advocated.

Mr. Parker is a firm believer in coordination of bus and trolley service carried to its logical conclusion. He believes that a policy of rapid transit for street car operation that would actually live up to its name would do much to eliminate the traffic disorders of the body politic in most of the more crowded communities of the country. Then in place of trolley car stops at every corner could be substituted a covering bus service, which would serve to gather up passengers along the right-of-way, transport them to the trolley stops and there permit them to transfer to the faster express service provided by the street car.

Continuing, Mr. Parker says:

> The plan means simply to speed up any carrier that otherwise becomes a stricture in the center of the street and obtain rapid transit, not just simply by increasing the velocity of the vehicles but by decreasing waiting time. To have a bus line intersecting a trolley line is not co-ordination fulfilled to its best advantage. Run the trolley cars as express service and also put buses on the same streets to stop at every intersection—but at the curb.
>
> While the radicals are claiming that buses can efficiently replace the trolley, those who cry it the loudest have studied it comprehensively the least and know the least about it.
>
> Don't eliminate the street car—just speed it up. Give it a chance to develop its efficiency. It has a very definite place in the transportation picture of every city which is proud of its industrial institutions.
>
> In some cities in the United States the trolley car has never been allowed to develop its greatest efficiency. It is a better vehicle than most of us think it it because we have never had the chance to see it operate at its best. Give the trolley car the chance it has been yearning for and you automatically put the motor bus in its best environment.

Bus Program at Buffalo to Proceed

The operation of two new bus lines, the extension of an existing bus line and the scrapping of two railway lines in Buffalo will probably be authorized by the Buffalo City Council during April. This was indicated after a public hearing on the application of the International Bus Corporation, a subsidiary of the International Railway, for permission to operate additional bus routes in the city. The company's application of last summer was revived following the collapse of the Howe 5-cent bus proposals.

Three members of the Buffalo City Council have indicated their approval of the plan of the International Bus Corporation. Final approval of the franchise, however, has been delayed for a short time so negotiations can be carried on between the City Council and representatives of the company over certain terms and conditions. If the franchise is granted, there will probably be no delay in getting the necessary approval from the Public Service Commission.

The new bus routes would operate in Richmond Avenue, replacing the Hoyt Street one-man car line and a crosstown line covering Best-North Streets, replacing the Best Street car line. The present bus route in Bailey Avenue would be lengthened. Double-deck buses would be operated over Richmond Avenue with single-deck buses on the Best-North Street route. The company's plans have the approval of the Buffalo Chamber of Commerce and the Buffalo Business Federation.

Transportation Agencies Unified in Tulsa

An important step toward unification of transportation facilities in Tulsa is involved in the purchase by the Oklahoma Union Railway of the buses and equipment of the Brasier Transportation Company and the People's Transportation Company. The consideration was not divulged, but the value of the equipment is about $250,000.

Duplication of service, which has existed for months under the competitive system, will be eliminated and the extra buses will be placed on routes in sections of the city which have not heretofore had adequate bus or street railway service. Transfers will also be issued from one bus line to another and from the buses to street car lines so as to enable riders to purchase a continuous ride across the city for a single fare. The proposed unification and rerouting plans were approved by the City Commission on March 23.

Bus Bills Progress in New York

The Senate of New York on March 29 passed and sent to the Assembly the two Thayer bills amending the public service commission law in relation to bus lines.

One of these bills amends subdivision 9, Section 2, by including as common carriers persons or corporations publicly transporting persons or property in motor vehicles between fixed terminals or over a regular route. The second bill adds new Article 3-a to the public service commission law, bringing under the supervision of the Public Service Commission stage, omnibus or motor vehicles operating between fixed terminals or over a regular route as common carriers.

Increased Service Sought.—Extension of bus service in the northwest, southwest and southeast sections of the city of Miami, Fla., was asked recently of the Miami Beach Railway, operating the city buses, by H. H. Arnold, traffic director. Mr. Arnold has completed a survey of the territories affected and said that the new routings would be a great convenience to thousands of residents in the outlying communities.

Protects Existing Agencies.—Mayor Nichols of Boston has vetoed the order of the Boston, Mass., City Council authorizing Franklin L. Hart of Dorchester to establish a bus line between Boston and Keene, N. H. The Mayor takes the same view that Mayor Curley held, that the regular transportation agencies, the railroads and street railways should be protected against competition which would cripple them and cause impairment of service.

Would Run Buses in Conjunction with Cars. — The Dover, Somersworth & Rochester Street Railway, Dover, N. H., has petitioned the Public Service Commission of New Hampshire for authority to use buses in co-ordination with its railway lines. It also asks for permission to discontinue trolley service on any or all parts of its system as is found advisable and substitute bus service entirely if necessary. Present plans of the railway are to operate buses over the Dover, Somersworth, Rochester and East Rochester route and over the Somersworth-Rochester route, via the East Side state highway and Rochester Hill. The matter is up for a hearing at Concord, N. H., on April 27.

Bus Line Restrained.—Circuit Judge George A. Crow of Belleville, Ill., has issued an injunction restraining the Community Motor Bus Company of Belleville, Ill., from operating two bus lines until it obtains certificates of convenience from the Illinois Commerce Commission. The injunction was sought by the East St. Louis & Suburban Railway and its bus line subsidiary, the Red Line Motor Bus Company. The Community company is restrained from operating buses between Collinsville and Troy, Ill. This line competes with the Red Line's buses. The other route affected is between East St. Louis and Collinsville, Ill., in competition with the East St. Louis & Suburban Railway.

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Financial and Corporate

British Columbia Issue Sold Quickly

Customer-Ownership Campaign Successful—$7,125,300 in Shares Subscribed in Less than Six Days

More than 11,500 applications for $7,125,300 in shares in a period of five and a half days is the record of a customer-ownership campaign just concluded by the British Columbia Electric Railway, Vancouver and Victoria, B. C.

Employees of the company to the number of 1,410 bought shares to the value of $602,000 and brought in 9,441 customer applications for a total of $5,023,300. Local brokers reported applications which are expected to bring the number of shareholders above 11,500 for $1,500,000 more.

The offer made to the public was $2,250,000 of 6 per cent cumulative preference shares of the British Columbia Electric Power & Gas Company, a Canadian company, dividends being guaranteed by the British Columbia Electric Railway, the parent company. Of the amount offered $1,500,000 was underwritten by a syndicate of bond dealers and the remaining $750,000 allotted to employees to buy themselves and sell to the public. The price was 99.

Applications were limited to 50 shares and no applications would be accepted from non-residents of the province of British Columbia. The population of the territory served is 350,000.

It was originally intended to open the sale on March 20, but owing to public demand, arising through the spread of news of the offer, the company was forced to allow brokers and employees to take applications on March 15. It was impossible to push the advertising campaign ahead more than two days or to March 17, but in spite of that brokers sold out their amount in two days and employees their allotment in 24 hours.

On the third day of the sale, when the advertising began to be effective, sales totaled $1,200,000. The closing date had been named in the prospectus as March 31, and when oversubscription was seen to be inevitable this date was pushed ahead to March 20. Applications continued to come in at a rapid rate, although employees were requested to make no new efforts.

COMMENT VERY FAVORABLE

One department of the company in Vancouver, the accounting department, with 187 employees, sold nearly the entire original allotment of $750,000. Employees of the Vancouver railway department to the number of 300 took shares of a total value of $132,700 and this department made no less than 959 sales of a total of $458,000. The city of Victoria with a population of 50,000 bought $1,000,000, par value, of shares.

Newspaper comment declared that the oversubscription indicated the public's confidence in the company and demonstrated public opinion of its integrity. No such public subscriptions had been seen since the days of Victory loans during the war. It is noteworthy that more than 3,000 applications were received for single shares. The shares will be allotted in a slightly increasing scale so as to secure the widest possible distribution. It was intended to offer the remaining $2,750,000 of this issue next autumn, but the entire amount will now be placed.

All financing by the company has hitherto been done in England. George Kidd, president of the company, Vancouver, received congratulations from all quarters on what is believed to be a record accomplishment.

Net Deficit of $107,090 in Toledo

Revenue losses in Toledo due to private automobiles and bus competition resulted in a net deficit of $107,090 to the stabilizing fund of the Community Traction Company for the year ended Dec. 31, 1925. The previous year operation resulted in a net deficit of $209,786. These facts were disclosed in the annual report of the commissioner submitted recently to the City Council at Toledo. Offsetting the 1925 deficit, however, is the credit of $284,149 set aside from revenues for the sinking fund requirements through which car riders are purchasing the properties for the city.

Total operating revenues for the year were $3,610,934, compared with $3,779,289 in 1924. Operating expenses were reduced from $3,029,990 in 1924 to $2,742,484 in 1925. Revenue passengers carried in 1925 totaled 48,377,487, compared with 53,161,617 in 1924. It was brought out in the report that the loss of patronage occurred in the months prior to September when fares were lower and more service was operated than the previous year.

Maintenance, repair and depreciation allowances taken directly from revenues amounted to $816,231. In addition the first railway extension in many years was made in Sylvania Avenue when more than a mile of track was added to the Cherry Line.

Claims and damages, including cost of administration, were cut to $135,346. Automobile accidents showed an increase, indicating that the main thoroughfare ordinance was less effectual than in the preceding year.

Twenty of the 500 type cars were rebuilt and equipped for one-man operation. New motors and trucks were installed along with safety equipment and other improvements. Twelve others not requiring rebuilding were equipped for one-man operation.

Through the sinking fund a total of $984,000 of bonds was retired and the cash balance of the fund was $194,152 at the end of the year.

Acting Commissioner E. L. Graumlich suggests that action which will insure a continuance of the transportation system on a stable basis is imperative.

He cites the fact that the sinking fund weighs heavily upon the revenues and makes fixed charges mount to a point where operation cannot be made to pay. He recommends that restrictions against use of modern equipment be taken away so that transportation may be provided as an aid to development of the whole city. He also suggests protection from competition.

Gross and Net of Market Street Railway, San Francisco, Up

Gross revenue of the Market Street Railway, San Francisco, Cal., showed a gain of $50,539 in 1925 and the balance after operating expenses and taxes was $2,227,959, an increase of 1.4 per cent over 1924. Bond interest and amortization of discount on funded debt was $937,991, an increase of $37,827, or 4.2 per cent, over 1924.

"Income Charges—Other" as it appears in the income account includes the interest on a judgment which the Pacific Gas & Electric Company ob-

INCOME AND EXPENSE ACCOUNT OF THE COMMUNITY TRACTION COMPANY FOR THE YEAR ENDED DEC. 31

			Cents per Car-Mile	
Revenue:	1925	1924	1925	1924
Passenger	$3,433,896	$3,515,692	51.045	49.456
Miscellaneous transportation	1,633	954	.024	.014
Other operating revenues	175,404	262,642	2.608	3.695
Total operating revenue	$3,610,934	$3,779,289	53.677	53.165
Operating expense:				
Maintenance	$681,106	$770,125	10.125	10.834
Depreciation	138,091	136,586	2.053	1.921
Transportation	1,157,719	1,285,716	17.210	18.087
Power	386,838	421,595	5.750	5.931
Traffic	13,917	1,983	.207	.028
General and miscellaneous	354,304	393,086	5.266	5.530
Street Railway Commissioner	10,507	20,896	.156	.294
Total operating expense	$2,742,484	$3,029,990	40.767	42.625
Net operating revenue	868,449	749,298	12.910	10.540
Taxes	190,331	183,450	2.829	2.580
Net operating income	$678,118	$565,847	10.081	7.960
Non-operating income	22,001	18,543	.327	.261
Gross income	$700,119	$584,391	10.408	8.221
Interest bonds and notes	436,498	443,088	6.489	6.233
Surplus	$263,620	$141,302	3.919	1.988
Preferred dividends	86,562	84,845	1.287	1.194
	$177,058	$56,457	2.632	.794
Sinking fund	284,149	266,244	4.223	3.745
Stabilizing fund	*$107,090	*$209,786	*1.591	*2.951

* Indicates deficit.

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tained against the Market Street Railway growing out of additional charges for electrical energy furnished the Market Street Railway, made pursuant to an order of the Railroad Commission. From this order the company appealed to the courts and an appeal from a judgment in the lower court is before the Supreme Court of California.

President Starring says that the reduction of the funded debt in the hands of the public from $13,000,000 on April 1, 1924, to $12,239,000 at Dec. 31, 1925, is worthy of note. He points out that the sinking fund payment of a total of $500,000 per annum, although decreasing the company's available cash, does not decrease its earnings, inasmuch as it correspondingly decreases the funded debt of the company.

Mr. Starring explains that for several years past negotiations have been pending with the city of San Francisco concerning the city's purchasing the railway operative property. In 1925, pursuant to an initiative petition, the question of the city's purchase of the property was submitted to the voters and overwhelmingly defeated.

More than 350 cars were overhauled in the general shops and put in first class condition. Also 24 new cars were built and put into service. A maximum of 673 cars in daily operation was reached in December. In September the company commenced the operation of its first bus. Jitney competition is considerably reduced, but competition of the Municipal Railway is energetic.

Much work was done to the other physical property of the company to keep it to a high standard.

STATEMENT OF INCOME AND PROFIT AND LOSS OF MARKET STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1925

Operating Revenue:		
Passenger	$9,830,196	
Other	72,572	
Total		$9,902,768
Operating Expenses and Taxes:		
Maintenance of way and structures	648,646	
Maintenance of equipment	648,008	
Power (including disputed charges)	1,331,060	
Transportation and traffic	3,607,856	
Miscellaneous	822,235	
Total	7,057,808	
Taxes (other than Federal income taxes)	617,000	
Total operating expenses and taxes		7,674,808
Net operating revenue		2,227,959
Other Income Credits:		
Interest	34,539	
Other	16,523	
Total		51,062
Gross income		2,279,022
Income Charges:		
Interest on funded debt	882,509	
Discount on funded debt	55,482	
Provision for 1925 federal income tax	106,924	
Depreciation of railroads and properties	500,000	
Other	41,970	
Total		1,586,886
Net income for the year		692,136
Surplus at beginning of year		2,060,069
Profit and loss credits		2,545
Gross surplus		2,754,751
Profit and loss charges—net adjustment of discount on funded debt		29,180
Surplus, Dec. 31, 1925, per balance sheet		$2,725,570

How a Financial Authority Sees It

The toppling of prices of stocks the present month does not indicate the beginning of a period of "depression" in business, but it must be said that it is not a salutary thing for the country. For months, with only a few reverses, quotations of stocks had been continuously rising. Prices in many cases had come to bear no relation to intrinsic values and current earnings. Factors, such as "mergers" and splitting of shares, and combines, have shown very large paper values. And upon a continuation of these factors prices have been enhanced by trading on the exchanges. Their worth was not allowed to prove itself, but was discounted in advance.

As a consequence, under the influence of easy money and the liberal use of Reserve credit, the whole market became speculative. Now, when through some unforeseen element prices fall suddenly, it must be true that tens of thousands of "outsiders" are caught in the slump and lose their all. For this desire to speculate seems to be innate in human nature. Most persons like to "make money" fast, and seeing others "make," albeit the profits are on paper, are induced to buy at the then "top." And these losses bode no good to business, though they do not necessarily mean "depression."

This much is certain in any event, namely, that as a result of the gigantic stock speculation of the last two or three years a vast deal of financial energy has been absorbed in non-productive uses. And it follows that a redundant money supply has been a sustaining element to the detriment of legitimate business. In this view the consequences of a "smash," provided producing business is not disastrously affected, may augur good to the country at large. And this effect, if indeed it eventuate, will be widespread. — *Commercial and Financial Chronicle.*

Arrangements Made to Pay Back Dividends of Republic Railway

Plans have been declared operative under which the accrued dividends on the preferred stock of the Republic Railway & Light Company, New York, amounting to $34.50 will be paid and the exchange of Republic preferred stock will be made for an equal amount of 6 per cent cumulative preferred stock of the Penn-Ohio Securities Corporation. The cash payment is equivalent to the dividends accrued and unpaid on Republic preferred to Jan. 15,1926, and the new preferred of Penn-Ohio Securities is cumulative from that date. A substantial majority of the stock has already been deposited and the new stock and cash will be ready for delivery April 5. The exchange offer, however, will not expire until April 10.

Protective Committee for Chicago Railways

A bondholders' protective committee has been formed for $62,785,000 of Chicago Railways first mortgage bonds which mature on Feb. 1, 1927, the date on which franchise expires. The committee is headed by Albert W. Harris, chairman of board of the Harris Trust & Savings Bank. The statement issued by the committee says:

Notwithstanding the favorable relation between the amount of first mortgage bonds and the acknowledged value of property and favorable relation of annual interest charge to company's earnings available for payment of such interest, the present credit position of the company is such that an ordinary refunding operation appears to be impossible.

Maryland Interurban Reports Surplus in 1925

The Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., reports a deficit in net income in 1925, but on account of profit and loss credits it finished the year with a surplus of $245,243. During the year 4,021,766 revenue passengers were carried, against 4,429,387 in 1924. Car-miles operated totaled 4,582,032. One per cent of the gross operating revenue of the company was credited to "Reserve for Injuries and Damages." The balance in the reserve account as of Dec. 31, 1925, was $125,025. The disbursements in payment of accident claims, suits, judgments and other expenses of the department amounted to 1.32 per cent of the gross operating revenues.

SUMMARY OF INCOME AND PROFIT AND LOSS OF WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD FOR YEAR ENDED DEC. 31, 1925

Operating revenue		$2,694,910
Operating expenses prior to provision for depreciation		1,994,723
Net operating revenue prior to provision for depreciation		$700,187
Taxes assignable to railway and other operations		128,867
Operating income prior to provision for depreciation		$571,319
Non-operating income (net)		27,516
Gross income for the year applicable to interest on funded debt		$598,836
Deductions from gross income:		
Interest on funded debt	$518,804	
Amortization of discount on funded debt	47,077	
Provision for depreciation	46,488	
		612,370
Net income for the year		*$13,533
Profit and loss net credits during the year		258,776
Profit and loss gross surplus for the year		$245,242
Dividends paid		None
Profit and loss surplus for the year		$245,242
Profit and loss surplus at beginning of the year		527,837
Profit and loss surplus at close of the year		$773,080

*Deficit.

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Bus Plans for Twin City Reviewed in Annual Report

The total railway operating revenue of the Twin City Rapid Transit Company and subsidiary companies of St. Paul and Minneapolis, Minn., for the year ended Dec. 31, 1925, was $12,378,352, a decrease of $326,217 compared with the previous year. Total operating expenses were $9,234,089, an increase of $48,161. These facts were included in the annual statement of Horace Lowry, president of the company, to the stockholders.

The report gives in detail the history of the valuation and fare problems affecting the properties of the Minneapolis Street Railway and the St. Paul City Railway. The various steps in this controversy have been reviewed in the ELECTRIC RAILWAY JOURNAL from time to time.

On the subject of bus competition the report states that in order to protect the railway property it was necessary to take steps to provide for the demands for bus service, properly coordinated with railway service. In order to bring this about the purchase of the Twin City Motor Bus Company was effected, and negotiations were pending for the purchase of the third and last competing bus line in the Twin Cities. Mr. Lowry stated that the management believed it would be to the best interests of the company and the public to have bus service as well as street railway service controlled by one transportation company. No serious difficulty is expected in working out this problem with the cities so that a co-ordinated street railway and bus service would be provided which would not operate to the disadvantage of the company's railway service, "so desirable and essential to the public."

During the year earnings were sufficient to pay regular quarterly dividends at the rate of 7 per cent per annum on its preferred stock and to permit two semi-annual dividends of 2 per cent each to be paid on the common stock.

Discontinuance of Onset Street Railway Suggested

Financial difficulties have overtaken the New Bedford & Onset Street Railway, New Bedford, Mass. The stockholders have voted to inform the holders of bonds which mature next January that "the company is not in position to pay the same and is unable to offer a refunding plan which appears practicable. The directors of the road, therefore, suggest to the bondholders the appointment of a committee to consider what action they may deem best to take in the premises." President Crapo says:

> The confidence of the promoters of the New Bedford & Onset Street Railway has at no time been justified. Until of late, however, it has been able to earn barely a net sufficient for a small amount of depreciation and to pay the interest on its $280,000 of mortgage bonds which were once extended and will come due Jan. 1, 1927.
>
> It would seem that all possible economies of operation have been exhausted and that there is no prospect of a chance for the better. Such being the case and in view of the approaching maturity of the bonds it seems proper to stockholders to take such action as will enable the bondholders to determine whether the railway shall continue to be operated or liquidated.
>
> The explanation of the situation is simply the development of the use of automobiles. The transportation service rendered for 25 years to the communities in which the railway operates without return to the owners has been of a large benefit to the communities. In matters of its continuance these communities manifestly have an interest. What action they may see fit to take is for them to determine.

CONSOLIDATED INCOME STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1925	1924
Revenue from transportation	$12,269,156	$12,593,798
Revenue from other railway operation	109,196	110,770
Total railway operating revenue	$12,378,352	$12,704,569
Way and structures	$1,215,796	$1,175,455
Equipment	1,129,065	1,039,108
Power	1,270,698	1,336,670
Conducting transportation	4,391,692	4,308,179
Traffic	36,233	46,479
General and miscellaneous	1,248,919	1,351,255
Transportation for investment—credit	—58,317	—71,222
Total railway operating expenses	$9,234,088	$9,185,927
Net operating revenue	$3,144,263	$3,518,641
Taxes assignable to railway operation	1,291,137	1,265,982
Operating income	$1,853,125	$2,252,659
Income from unfunded securities and accounts	$73,045	$53,312
Miscellaneous income	49,666	37,394
Net income miscellaneous physical property	61,918	10,355
Total non-operating income	$184,631	$101,061
Gross income	$2,037,757	$2,353,721
Rent for leased roads	$3,000	$3,000
Interest on funded debt	988,954	1,072,968
Miscellaneous debits	8,375	8,744
Total deductions from gross income	$1,000,329	$1,084,712
Net income transferred to profit and loss	$1,037,427	$1,269,008

PROFIT AND LOSS ACCOUNT OF THE TWIN CITY RAPID TRANSIT COMPANY

Balance Jan. 1, 1925		$1,876,038
Additions for the year		1,037,427
Net adjustments	$29,332	
Dividends on preferred stock	210,000	
Dividends on common stock	880,000	
Balance carried forward	1,794,133	
	$2,913,465	$2,913,465

STATISTICAL STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1925	1924
Total revenue	$12,562,983	$12,805,631
Total operating expenses	$9,234,088	$9,185,927
Net revenue	$3,328,895	$3,619,703
Revenue passengers carried	200,783,106	209,202,818
Transfers redeemed	72,814,559	74,698,853
Operating, per cent of revenue, taxes included	83.78	81.62

TRACK MILEAGE AND PASSENGER REVENUE PER MILE OF TWIN CITY RAPID TRANSIT COMPANY

Total miles, first track	266.11
Total miles, second track	200.18
Total miles, carhouse and storage track	32.83
Total miles, all track	499.12
Average total miles, track operated during 1925	495.49
Total miles street and right-of-way occupied by tracks	257.49
Average total miles street and right-of-way occupied by tracks operated during 1925	255.61
Gross passenger car revenue per mile, single track operated	$24,674.96
Gross passenger car revenue per mile, street occupied by tracks, operated	$47,831.46
Gross passenger car revenue	$12,226,198.34

Protest on Valuation on April 9.—Following a conference in which members of the Maryland Public Service Commission, counsel for the United Railways & Electric Company, Baltimore, and Clarence W. Miles, people's counsel, took part, the commission has set April 9 as the date to hear a protest filed by the United. The company protests the valuation of $77,000,000 placed upon its property by the commission. The protest declares that the valuation is too low. The people's counsel recently filed a petition in court in which it is asked that the $7,000,000 included for easements in the commission's valuation be stricken out.

Committee Formed to Protect Bondholders—A committee has been appointed to look after the interests of the first mortgage bond holders of the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich. The interest due on Jan. 1, 1926, on the $1,500,000 of first mortgage 5 per cent 25-year gold bonds, is in default.

Net Income Slightly Lower.—For the eight months period ended Feb. 28, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $7,486,575, against $7,485,501 for a similar period of last year. Operating expenses and taxes fell from $6,494,789 for the eight months period ended Feb. 28, 1925, to $6,394,466 for a similar period ended this year. After the consideration of income deductions the eight months period ended Feb. 28 of this year resulted in a net corporate income of $930,680, against $936,832 for a similar period of the year previous.

Partial Discontinuance Allowed.—The Washington Railway & Electric Railway of Washington, D. C., has been authorized by the Public Utilities Commission to discontinue permanently railway service on Macomb Street and Massachuetts Avenue from Wisconsin to Western Avenue and to remove rails.

Tax Abatement Request Tabled.—In preparation for the proposed sale of the Hartford & Springfield Street Railway, Warehouse Point, Conn., under decree of foreclosure and in line with anticipated plans for reorganization of the company, Harrison B. Freeman, receiver, has applied to Board of Control, Hartford, Conn., for abatement of back taxes amounting to $62,336. The company owes $73,250 in taxes from 1917 to 1925. In that time it paid the state $29,418 taxes and plans to pay the 1917 taxes, amounting to $10,913. The request was tabled by the board.

Bus Operation Increases Revenues.—For the second time since Jan. 1, 1925, the Madison Railways, Madison, Wis., in February has showed an excess in gross passenger revenues compared with the average four-year period during the corresponding month. During February, this year, the street cars and buses carried 589,362 passengers, against 553,091 during a similar month a year ago, at which time, however, the company was not operating buses. Gross revenues jumped from $36,462 in February, 1925, to $39,337 in February, 1926. Revenues from railway service alone in February, 1925, was $36,462, compared with $35,531 in February of this year.

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Legal Notes

CONNECTICUT — *Railway Not Liable After Alighting Passenger at an Irregular Stop Is Struck by Passing Automobile.*

In this case a one-man car stopped about 15 ft. short of a painted pole which designated a regular stopping point, and a passenger who alighted was struck and injured by a passing automobile. The court held that the company was under no duty to have its car stop at the white marked pole. It might stop its car at any convenient place in the vicinity, provided that access to the sidewalk was afforded upon a highway which was not defective or dangerous. Finally, the motorman was under no duty to warn alighting passengers of danger from approaching automobiles. Such a danger is as well known to a passenger as to a motorman or conductor, and the danger can be avoided only by the passenger himself. He is also in a better position to observe automobiles coming from behind than a motorman on the forward end of a car. [St. John vs. Connecticut Co. et al., 131 Atlantic Rep., 396.]

MARYLAND. — *Contributory negligence of child running into street cars.*

As a matter of law, a four year old child cannot be considered guilty of contributory negligence merely because he collided with the side of a car, which was traveling at a high rate of speed. [State vs. Washington B. & A. Electric Railway, 131 Atlantic Rep., 822.]

MASSACHUSETTS—*Sudden Starting of Car with All Passengers Inside Ordinarily Not Negligent.*

A female passenger on a one-man car signaled by a push button that she wished the car to stop, but as she approached the exit, another passenger got off. The operator without looking around then closed the door and started the car "with an awful jerk," throwing the passenger to the floor. The court held that the sudden starting and stopping of a car, when passengers are fairly within it, even if they are not seated, is not negligence, and the company was held not liable for this accident. [Gollis vs. Eastern Mass. St. Ry., 149 Northeast. Rep., 607.]

NEW YORK—*Conditions of Sale of Bus Franchises.*

Cities the size of Yonkers are authorized to establish bus routes and provide for their sale at public auction. The successful bidder must then secure from the Public Service Commission a certificate of convenience and necessity before beginning operation. The city of Yonkers established 13 bus routes and provided for their sale in a group, but the plaintiff, a tax payer, brought suit to restrain the sale on the ground it would result in a waste of city property. It said it would bid for some of the franchises if sold separately, but could not do so if all were sold together. The Supreme Court held that such a grouping imposed an unnecessary burden on cities, suppressed competition and limited the amount that would be given for a profitable franchise. Such a sale could therefore be enjoined by a tax payer. A provision in the city ordinance providing for the sale, reserved to the city the right to require extensions or additions of the same kind from the purchaser of the franchise. The court held that if this meant a grant to the purchaser of a future franchise, it was contrary to the statute requiring the sale of franchises at auction. [Yonkers Ry. vs. City of Yonkers et al., 212 New York Supp., 339.]

NEW YORK—*Injury to Descending Passenger Stepping on Partly Unfolded Step.*

A trolley car was standing still and the door, which operated in conjunction with a folding step, was sufficiently open for a passenger to pass through when leaving the car. As such a passenger placed her foot on the step to alight, it unfolded and threw her to the ground. The company was held liable. [Micklin vs. Union Railway, 212 N. Y. Sup. 291.]

OHIO—*Interstate Bus Carriers Subject to Utilities Commission, Except Where Its Rules Involve Direct Burden on Interstate Commerce. Such Burden Not Involved by Forbidding Carrier to Conduct Intrastate Business.*

An interstate bus company received and accepted a certificate of convenience and necessity with the qualification that it could not conduct intrastate business because an existing intrastate bus company served the same route within the state. The older company opposed the grant of the certificate, which was upheld by the Supreme Court, which held the certificate imposed on the interstate bus company "the usual regulations imposed on all companies engaged in intrastate commerce within the state" while the denial of a right to receive intrastate passengers protected the existing company. It also held that this condition was not an unreasonable burden upon interstate commerce. [Cannon Ball Transportation Co. vs. Public Utilities Commission of Ohio, 149 Northeast. Rep., 713.]

TENNESSEE—*Law Prohibiting Operation of One-Man Cars in Cities of More than 30,000 Population Too Indefinite.*

The Tennessee Legislature of 1925 passed an act prohibiting the operation of one-man cars except in cities of less than 30,000 population. The act was held invalid because it did not declare whether the population was to be determined by the federal census of 1920 or some other census and whether the prohibition went into effect when a city attained the population mentioned. [Knoxville P. & L. Co. vs. Thompson et al., 276 Southeast. Rep., 1050.]

WASHINGTON—*Statute Requires Commission to Grant Certificate to Existing Transportation Company in Preference to Development Company Financing Part of Highway Used.*

A development company, prompted by public spirit, assisted financially in the construction of a highway through a national forest reservation and then applied for a certificate of convenience and necessity for the operation of buses not only over this extension but beyond to the town of Bellingham. An existing bus line had given good service for a number of years from Bellingham to the beginning of the extension to the highway and its application for a certificate to give through service from Bellingham to the further end of the extended highway was granted by the commission in preference to the development company. This action was upheld by the Supreme Court of Washington. [Yelton & McLaughlin vs. Department of Public Works et al., 240 Pacific Rep., 679.]

WISCONSIN—*Railroads Will Not Be Debarred Because They Interfere with Zoning and County Planning.*

The Railroad Commission is not authorized to refuse a certificate of convenience and necessity for the proposed extension of an electric railway required for the convenience and necessity of the general public because of the inconvenience to individuals along the proposed right of way or because of detriment to municipal zoning plans. In consequence, evidence of such zoning plans and county planning need not be considered by those empowered to issue certificates of convenience and necessity, because such evidence is immaterial to a decision in the case. [Milwaukee E. R. & L. Co. vs. Milwaukee County, 206 Northwest. Rep. 201.]

WISCONSIN — *Control of Commission over Terms for Leased Property*

A power company owned a dam and transmission line, and at no time had furnished light, heat or power to any one, but had simply leased its property and equipment to a public utility company for that purpose. Such a power company was held not to be a "public utility" under the meaning of that term in the Railroad Commission statute. Hence the commission was without jurisdiction to regulate or control the terms of the lease of its property to a public utility company, and its jurisdiction was confined to the rates charged to the public by the public utility company, but if it found the rental paid by the latter to the power company was unreasonable, it could allow only such charges as it thought reasonable. In fixing such rates, the commission can take into consideration the amount for which the utility might obtain similar service from other sources. The court said that the public is primarily and solely interested in a reasonable rate, which it is the duty of the commission to fix. A rate may be reasonable although it may permit the utility to earn a return beyond the legal rate of interest on the money invested. [Chippewa Power Co. vs. Railroad Commission et al., 205 Northwest. Rep., 900.]

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Personal Items

Changes in Philadelphia Personnel

W. K. Myers Succeeds W. C. Dunbar—R. F. Tyson, Operating Vice-President, Made Member of Board

Changes made in the personnel of the Philadelphia Rapid Transit Company, Philadelphia, Pa., at the annual meeting of the company on March 17 were referred to briefly in the ELECTRIC RAILWAY JOURNAL for March 20. The board accepted the resignation of W. C. Dunbar and elected as president W. K. Myers, who has been acting president during Mr. Dunbar's absence in Detroit. Mr. Dunbar is temporarily released by the Mitten organization at the request of P. R. T. bankers to aid them in the financial rehabilitation of their Detroit interests.

Mr. Dunbar's letter of resignation, addressed to T. E. Mitten, chairman of the board, follows:

> Dillon, Read & Company are desirous that I should continue to act as receiver for the Detroit United Railway, this in order that I may further assist in formulating a plan of reorganization for that company. It is my belief that we should help our bankers in this particular, and I am personally most anxious to complete the work on which I have already spent several months.
>
> Agreeable to our conversation of this morning, I therefore submit my resignation as president of P. R. T., effective March 17, which is the date of the annual meeting and consequently the date of the election of a new president.
>
> P. R. T. has now passed through its most serious financial phases, so that my particular talents in this direction can be spared. Vice-President Myers will, I believe, permanently fill the duties of this position to your satisfaction. Meantime the experience gained in my added work at Detroit will, I am sure, be of great benefit to our organization.

T. E. Mitten was re-elected chairman of the board and C. J. Joyce vice-chairman. Mr. Mitten, Mr. Joyce and Mr. Myers were named members of the executive committee, Mr. Myers replacing Mr. Dunbar in this capacity.

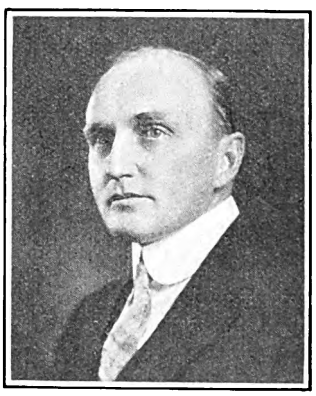
At the annual meeting of P. R. T. stockholders C. B. Hauseman, electrician in the way department and president of the employees' co-operative association, was elected a member of the board of directors, succeeding F. F. Slook, the retiring president of the association.

R. T. Senter, who has been made a director and vice-president of Mitten Management, Inc., will leave the P. R. T. board to make way for S. H. Stout, electrical switchboard operator and recently elected vice-president of the co-operative association. With two representatives on the board, P. R. T. employees will thus have a continuing representation, since the vice-president of the association succeeding the president makes this office, with this directorship, an effective training for the presidency of the association.

R. F. Tyson, operating vice-president, was also made a member of the board.

T. E. Mitten, C. J. Joyce, A. A. Mitten, W. K. Myers and Leon Jewell were re-elected members of the board.

The career of Mr. Myers has been reviewed before at length in the ELECTRIC RAILWAY JOURNAL. He went with the Philadelphia Rapid Transit Company in 1919 as valuation manager and member of the valuation committee, was made vice-president in charge of accounting and finance in 1923 and since Aug. 25, 1925, has been acting president in the absence of W. C. Dunbar. Mr. Myers was born on Dec. 17, 1883, in Millville, N. J. He was educated in the public schools of Lancaster, Pa., and was graduated from Pennsylvania State College in the class of 1905 with the degree of B. S. From 1908 until 1919 he was on the staff of the board of supervising engineers, Chicago Traction, where he was engaged in general engineering work in connection with the rehabilitation of the surface electric railway lines in the city of Chicago.



W. K. Myers

Mr. Hauseman is the youngest man to hold the office of Co-operative Association president. He was born in Baltimore in 1895. He went to work for P. R. T. at the age of fourteen, serving as an apprentice in the way department. After three years, he left the company to work at his trade for two years. In 1917 he returned. His total service with P. R. T. has been eight years. Mr. Hauseman attended the Philadelphia grammar schools and the Philadelphia Trade School, in which he took the electrical course.

Mr. Stout was born in Burlington, N. J., in 1878. In 1904 he joined P. R. T. in the electrical department, where he has been up to the present time. Since 1918 Mr. Stout has been active in men and management relations, having been an employee committeeman since that time, with the exception of one year when he was defeated for re-election by one vote. He was chairman of the employees' general committee for five years and several times chairman of his departmental committee. Mr. Stout attended the public schools in Burlington, N. J., took a course in business administration at the Trenton Business College and attended Temple University for two years.

D. K. Lewis in Executive Post at Twin Cities

D. K. Lewis, chief electrical engineer and operating superintendent of the Mexico Light & Power Company and the Mexican Tramway, Mexico City, for three years, has been appointed assistant to T. Julian McGill, vice-president of the Twin City Rapid Transit Company, Minneapolis, Minn. He succeeds W. W. Whiteford, who resigned on Jan. 1, to go into the bus sales business.

Mr. Lewis is an electrical and mechanical engineer. He was graduated from Clemson College, S. C. He went into the testing department of the General Electric Company at Schenectady, N. Y., in June, 1903. Later, for twelve years, he was a foreman of construction for the company at Chicago. From April, 1917, to December, 1918, he was in the army.

In 1920 Mr. Lewis was appointed electrical engineer for the Fort Dodge, Des Moines & Southern Railroad at Boone, Iowa. From November, 1921, to July, 1922, he was electrical engineer for the Winnipeg Electric Railway. Then he became manager of the Camaguey Electric Company and the Camaguey Tramway, Camaguey, Cuba. In March, 1923, he went to Mexico for the English owners of the properties there.

Personnel Changes in New Bedford

Henry H. Crapo has resigned as president of the Union Street Railway, New Bedford, Mass., after 32 years of executive control.

Elton S. Wilde was advanced from vice-president and general manager to the position of president.

Edward F. Nicholson was made vice-president in addition to the position of treasurer, which he already holds.

Ernest Baines was elected to the position of assistant treasurer.

F. R. Cornell New Superintendent of Laurel Line

F. R. Cornell is the new superintendent of the transportation department of the Lackawanna & Wyoming Valley Railroad (Laurel Line) of Scranton, Pa., according to an announcement of P. J. Murphy, vice-president and general manager. In this position he succeeds J. H. Kilker, who was in charge of the transportation work for a number of years, but who resigned recently to engage in other business.

The new superintendent is a railroad man of broad experience. He has been in the employ of the Delaware, Lackawanna & Western Railroad continuously since 1903. All told, he has been with the Lackawanna railroad for 23 years. For a number of years he was a trainman and then a conductor with that company.

Since the resignation of Mr. Kilker several weeks ago the affairs of the transportation department have been well and capably administered by J. H.

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Murray, former superintendent of that department and employed by the Laurel Line practically since it was placed in operation.

F. J. Boehm Secretary and Treasurer at Milwaukee

Frank J. Boehm, assistant secretary and assistant treasurer of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., since 1906, has been promoted to secretary and treasurer. Mr. Boehm has been associated with the Milwaukee company for 40 years. He started with the company as an office boy in 1882, was promoted successively to clerk, bookkeeper, accountant and auditor.

E. C. Parham Promoted in Brooklyn Repair Shops

E. C. Parham has succeeded the late Frederick N. Parsons in the capacity of general foreman of the electrical repair shop of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. He was advanced from the position of foreman.

Mr. Parham served an apprenticeship of three years at the works of the General Electric Company in Schenectady, N. Y., beginning in 1890. Following this activity he joined the Steel Motor Company, Cleveland, a subsidiary of the Lorain Steel Company. Here it was that he made the acquaintance of the late Mr. Parsons, a contact which became closer a short time later in Brooklyn. Mr. Parham's early association in Brooklyn lasted only one year, for during the next five years he turned his attention to the writing of text books for the International Correspondence School.

However, he was destined to return to railway work and in 1903 he joined the Public Service Railway, Newark, N. J., in the capacity of electrical repair foreman at the Plank Road shops. Then he engaged in work on power house equipment for the Metropolitan Railway in New York and one year later again went with the General Electric Company.

Westinghouse Sales Officials Are Advanced

E. H. Sniffin has been appointed assistant to the vice-president and T. J. Pace has been made director of sales for the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., as a result of a complete reorganization of the sales department, announced on April 1 by E. D. Kilburn, vice-president and general sales manager. The managing personnel has been reallocated and several new departments created. Other appointments made were M. B. Lambert to be transportation sales manager; G. H. Froebel, central station manager; J. M. Curtin, industrial sales manager; A. C. Streamer, assistant director of sales; H. W. Smith, generating apparatus manager; A. J. Manson, traction apparatus manager; O. F. Stroman, motor apparatus manager; R. A. Neal, switch gear apparatus manager, and G. A. Sawin, distribution apparatus manager.

J. A. Frates Heads Oklahoma Body

Operating Vice-President of the Oklahoma Union Railway Honored by Election to Association Post

J. A. Frates, Tulsa, Okla., vice-president of the Oklahoma Union Railway, was elected president of the Oklahoma Utilities Association at the convention in Tulsa during the week ended March 20. Mr. Frates is a former steam railroad man. For several years he was general superintendent of the Frisco lines. Following this he was promoted and then constructed several short steam lines in Oklahoma to afford facilities to the oil fields.

Like many other electric railways, particularly the roads in cities of moderate size, the Oklahoma Union Railway was hard hit by the adverse economic conditions imposed during the war-time period and later suffered from the severe competition of jitneys,

J. A. Frates

permitted to run almost at random in the territory which it served. Mr. Frates was one of the officers of the company who helped to scotch this unfair competition by turning the bus to the railway's own advantage. Under his direction the road has greatly developed bus transportation in Tulsa and interurban transportation by bus in that section of the state immediately surrounding Tulsa.

Mr. Frates has also played an important part in the proceedings of the company to secure increases in fare adequate to permit it to function properly. This activity by him applies not only to the railway, but to the bus lines as well. For the bus lines he secured an increase in the cash fare from 7 to 10 cents with a token rate of three for 25 cents. Even before full authority with respect to its operation of buses had been granted to the company, Mr. Frates had fortified it in advance by having fifteen more buses in storage waiting the time when additional service and new lines could be operated. He has also played an important part in developing the public relations policy of the company.

William C. Naegel, for many years with the Kuhlman Car Company, Cleveland, Ohio, has joined the Lang Body Company, Cleveland, Ohio, in a sales and engineering capacity and for special development work. The Lang Body Company builds and develops bus bodies both in parlor cars and street car type of equipment. While with the Kuhlman company and its subsidiaries Mr. Naegel had charge of engineering, building designing bus bodies.

W. A. MacCorkle Heads Charleston Interurban

W. A. MacCorkle has been elected president of the Charleston Interurban Railroad, Charleston, W. Va. He succeeds in that capacity the late F. M. Staunton. Mr. MacCorkle was also made chairman of the board.

Arthur M. Hill, formerly treasurer, has been advanced to the position of vice-president and general manager. He will have charge of the company's transportation system, including the several bus lines being operated out of Charleston. Mr. Hill succeeded I. N. Smith, who has been general manager but who now will be secretary and treasurer.

The position of assistant secretary-treasurer was created at the meeting and J. W. Cummins has been chosen to fill it.

T. F. Woodlock Confirmed as I.C.C. Member

After a five-hour battle behind closed doors the Senate on March 26 confirmed Thomas F. Woodlock as a member of the Interstate Commerce Commission, ending a struggle of fourteen months.

A. E. Irwin, an employee of the Interstate Public Service Company, Indianapolis, Ind., in the auditing department for several years, has been appointed assistant treasurer.

Charles Oldenburg has resigned as claim agent for the Chicago & Interurban Traction Company, Chicago, Ill., after a service of 23 years with that company. He will enter the employ of the Public Service Company of Northern Illinois in the right-of-way department.

Alfred J. Bohl, general auditor of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been selected to succeed Frank J. Boehm as assistant secretary and assistant treasurer. Mr. Bohl's rise has been from the foot of the ladder. He entered the service of the company in 1901 as a messenger. Successive promotions in the accounting department took him to the position of general auditor a year ago. As noted elsewhere in this issue Mr. Boehm has been made secretary and treasurer of the company.

A. V. Brown has been replaced by E. P. Denman as maintenance of way engineer of the Lake Shore Electric Railway at Sandusky, Ohio. Mr. Brown and A. G. Voight, his assistant, were retired when a reorganization order became effective March 1. Mr. Denman had been identified for a number of years with the Cincinnati & Dayton Traction Company. He was in the Lake Shore Electric Railway construction department in Sandusky before going to Cincinnati sixteen years ago.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

$700,000 Track Reconstruction Project in Cincinnati

Plans have been formulated by the Cincinnati Street Railway, Cincinnati, Ohio, to reconstruct car tracks upon nineteen important streets during this year at a total cost of $704,774, according to Walter A. Draper, president of the company. Mr. Draper said the company wished to have its improvement program coincide with the city's street resurfacing program for the year and stated that officials of the company were ready to discuss further the proposal made in a letter sent recently to the city administration. The cost of track reconstruction if the rails were laid just the same as at present would amount to $557,570, according to Mr. Draper, which amount would have to come out of funds for rehabilitation allowed the company by the Director of Street Railroads, under the present traction franchise. He characterized these funds as inadequate.

Cost of additions and betterments to present track construction caused by use of heavier rails and improved equipment would amount to $147,203, which, it was said, would be added to the capitalization of the company. Mr. Draper declared that the budget allowed the company only $419,678 for this work during the company year and that proposed track reconstruction, including the paving of the streets between the rails, would cost $137,892 more than the company would be allowed to spend. He suggested that this difference be made up by the city taking over the cost of repaving the streets between the tracks in several instances in order to allow the program to be carried out as fully as possible.

To Russia's Aid in Electrification

American electrification methods are generating to Russia, at least if negotiations to electrify Moscow's suburban steam railways and the construction of the Dneiper power plant become effective. The General Electric Company and Westinghouse Electric & Manufacturing Company of America have submitted specifications to Chairman Alexander Prigarin of the Amtorg Corporation, Soviet's Agency; these are estimated at $110,000,000.

Four delegates from the Soviet government, led by Joseph Tseshevsky, and including one woman engineer, Mme. T. Maretskaya, are expected to visit this country shortly to confer with officials here interested in the project. Because industry and agriculture have risen to almost the pre-war level, extension of electrified railways is essential to take care of the voluminous exchange in Russia.

The Dneiper River plant, which will derive its power from the rapids, will ultimately develop 600,000 hp., according to its engineers. It will be financially directed partly by the granting of operating concessions. The newest of these super-power systems now being organized in Russia is the one radiating from the Volkovstroy hydro-electric station near Leningrad. This system is to be completed by Swedish interests this spring with a maximum of 55,000 hp. Shatura station near Moscow, which operates on peat fuel, is generating 30,000 hp. Balachna station near Nijni-Novgorod, a peat-burning station also, is developing 20,000 hp. Shterovka station in the Donetz coal basin is expected to have 60,000 hp. eventually. All of these stations were built by German, Czechoslovakian and other European interests. Mr. Prigarin believes, however, that the Soviet government is anxious to introduce American methods and equipment into its power projects.

Too Many Laws About Bus Specifications

George Scragg Points Out Fallacy of "Over-Regulation" on Part of Individual States—Action Urged to Counteract this Tendency—Aid from Railways Needed

DECRYING the tendency on the part of various state legislatures to "over-law" bus operation, George H. Scragg, of the International Motor Company's bus department, made a graphic presentation of the economic features of state bus operation before the meeting of the National Automobile Chamber of Commerce motor truck committee meeting called in New York recently. Each state apparently feels called upon to extend its complete individuality through the medium of sometimes great and sometimes minute exactions in the matter of bus design, and the worst of it, according to Mr. Scragg, is that there is no real justification for these manifestations of superauthority on the part of the state government.

Massachusetts, with its not-to-be-denied instinct of aloofness from mere human contact, insists that bus operators shall be set apart from their fellow men by a special guard rail. This is demanded on all types of buses, in spite of the fact that it restricts overloading to 60 per cent on city jobs and 30 per cent on parlor car jobs.

Florida and North Carolina limit the width of the bus body to 84 in. It is generally conceded throughout the rest of the country that 90 in. is a reasonable width, but these two states know better than that. What matters it if the effect of this special body is to reduce the number of occupants of the bus very materially, since with a center aisle passengers can be carried only three seats wide? New Jersey is right in the van with its requirements. Manufacturers are required to build special bodies for operation there which are used nowhere else in the country, and the state has even gone so far as to prescribe dimensions for the chassis.

Operating Restrictions

Mr. Scragg pointed out that in Maryland buses over a certain weight must pay four times the normal tax. This tends to restrain operators from buying a job which might have a longer life at lower maintenance costs because of its sturdiness. The speaker intimated that some manufacturers of the lighter vehicles have been short-sighted enough to support this law instead of taking the broad position of the good of the industry.

Another point which illustrates the fallacy of airtight state regulations of minute operating details is found in the restriction made by some states as to the number of standees. According to the ruling, if the bus is loaded to the legal capacity, it will be illegal to carry an additional passenger. This situation occurs on routes with headways as infrequent as hourly. Particularly in view of the fact that railroad tickets are now being sold in Massachusetts for a joint railway and bus route, it is conceivable that a case may arise where a train will discharge a greater number of passengers than the legal capacity of the bus. These additional passengers, even though it be midnight and the bus is on its last trip, will be refused transportation. Another angle to this, said Mr. Scragg, is that buses are used to a great extent for the transportation of children to and from school and the limitation of capacity makes it uneconomical for the bus operators to give school children rides at special fares when the capacity is limited.

Mr. Scragg said:

> I notice that Secretary Hoover has recently announced the report of his committee on standardization of traffic laws throughout the country, and it seems unfortunate after all these years of battling for uniform laws, having arrived at a place where the government has appointed a committee to make suggestions on the matter, that it seems necessary to start all over again on bus regulation. I am the last one to say that laws should not be passed concerning the public safety, but it seems that many of these regulations go beyond that.

It is not necessary, in the opinion of Mr. Scragg, to enlarge at great length on the effect on bus manufacturers and operating companies alike if each one of the 48 states should decide to have a different law on specifications. Mass production would, of course, be impossible. It is natural that the bus manufacturer without crowding from state governments will improve the bus and make it a safer vehicle if for no other reason than in so doing additional selling points can be developed and marketed on a competitive basis.

It is significant that Mr. Scragg should make the point that it is unwise to expect much support from railway

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companies operating co-ordinated bus and trolley services in attacking this strong tendency toward over-regulation on the part of the states. The point has frequently been made by bus manufacturers that traction companies have not as yet really awakened to the material advantages to be derived from standardization in specifying bus equipment.

Mr. Scragg said:

It does not seem possible to get much support from the traction companies, inasmuch as they are not automotive-minded. Most traction operators point with pride to the individual cars they have on the roads. An operator speaks of his car as "my car," as one that he has designed, and it seems impossible to stir him into action in this matter. As a matter of fact, those in the traction industry who yell the most about the laws are the ones who are doing the same things themselves by laying down special specifications.

RECOMMENDATIONS

It was suggested that definite action be taken by the N.A.C.C. and by individual operators to bring to the attention of the proper authorities in each state the hardships involved in laws restricting the use of standard bodies throughout the country. Mr. Scragg also suggested that it might create a favorable reaction if the operators would offer to make suggestions of rulings which would accomplish the purposes desired by the legislatures, while at the same time safeguarding the welfare of the industry.

Continuing in this line of thought Mr. Scragg said:

In order that they may see that our opinions are not biased and that we are not looking at this thing simply from our standpoint, I think we should offer to give them the expression of a joint committee which would be formed of the following: A member of the N.A.C.C. for the automobile manufacturers, a representative of the A.E.R.A. for the traction companies, a representative of the A.A.A.—for the automobile public, and a representative of the S.A.E.—for the automotive engineering fraternity. In this educational way, I think something might be accomplished.

Production of Electric Locomotives Increases

Information on the production of electric locomotives in the United States during the past six years has recently been released by the Department of Commerce. Heretofore no effort has been made to distinguish in the official figures between steam and electric locomotives. Figures have been prepared on both domestic and foreign shipments by months for the six years. These have been consolidated into yearly totals here:

	Domestic	Foreign
1920	306	7
1921	221	17
1922	128	21
1923	207	62
1924	99	8
1925	144	40
Jan.-Feb., 1926	33	2

Ten Gas-Electric Cars Ordered by Boston & Maine

Ten new gas-electric rail cars have just been ordered by the Boston & Maine Railroad from the Osgood-Bradley Car Company, Worcester, Mass. Two of these are 73 ft. in length and eight will have a length of 61 ft. They are of the combination passenger and baggage type, each mounted on one motor truck and one trailer truck. The 73-ft. cars have a total seating capacity of 91 and the 61-ft. cars will accommodate 64 seated passengers.

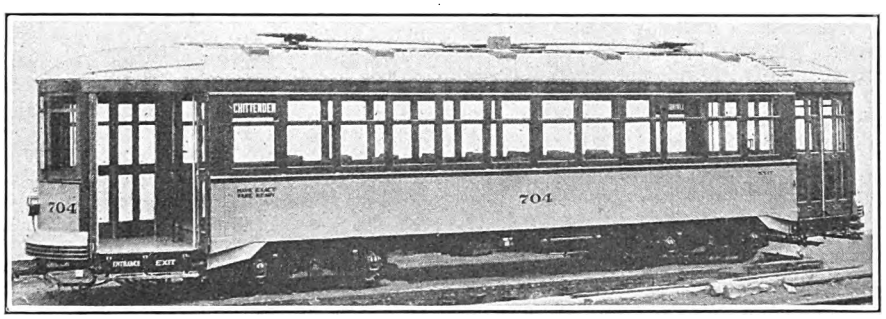
The power plant of these consists of a 275-hp. gas engine directly connected to a generator and mounted in an engine room at one end of the car. The cars are propelled through two electric motors mounted directly on the truck, in accordance with standard practice. Arrangement is made for double-end operation of the unit. All-steel construction is specified, and it is said that the design of the cars will provide for a number of rather novel features, the exact nature of which has not been made known.

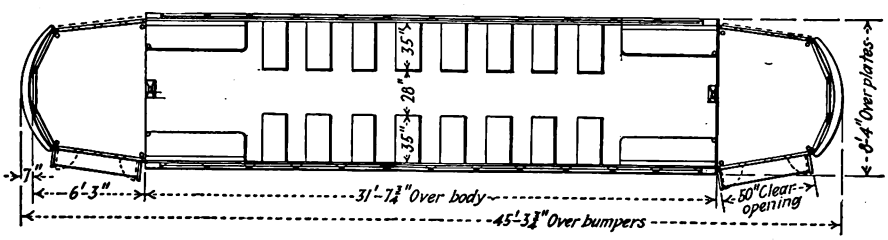
According to an announcement contained in the annual report for 1925 of the Boston & Maine, three of these new cars of the larger size will be used in suburban service at other than rush hours. The report continues:

While there is a field for the self-propelled passenger car on steam railroads its scope is by no means universal. The power and capacity of such cars are inadequate to meet the peak requirements of commutation traffic, and in the case of such short branch lines, with very light traffic, the investment and operating costs are out of all proportion to the revenue. In the former class of traffic motor rail cars cannot satisfactorily replace steam, with the greater capacity of the latter for handling peak loads. In the latter class the highway bus appeared to furnish the economical solution.

There is an intermediate field, however, where the passenger traffic does not warrant steam service, and in some instances the introduction of a less expensive substitute may permit of greater frequency of service and result in the retention of traffic which otherwise would be diverted to public or private transportation on the highway. Most of the new cars, like most of the thirteen which are now in operation, are intended to supply such an improved economical service on branch lines.

Columbus Company Gets 23 New Cars





Seats for 48 passengers are provided in the 23 new double-end motor passenger cars constructed for the Columbus Railway, Power & Light Company, Columbus, Ohio, by the Kuhlman Car Company of Cleveland. The interior is of cherry color and the seats are upholstered with brown leather. Principal data are given here:

Weights:	
Car body	18,180 lb.
Trucks with motors	16,040 lb.
Equipment	2,400 lb.
Total	36,620 lb.
Bolster centers, length	21 ft. 6 in.
Length over all	45 ft. 3¾ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. ¼ in.
Body	All steel
Interior trim	Cherry
Headlining	Agasote—metal vestibule
Roof	Arched
Air brakes	Westinghouse, furnished by railway
Bumpers	Hedley anti-climber channel
Car signal system	Faraday buzzer, Brill signal bells
Car trimmings	Polished bronze
Center and side bearings	Brill
Compressors	Westinghouse DH 16
Control	G. E. 265 Form A
Couplers	Van Dorn No. 27 head
Curtain fixtures	Pantasote
Curtain material	No. 63, brackets only
Destination signs	Hunter illuminated
Door operating mechanism	National Pneumatic manual
Fenders	Brill
Gears and pinions	Solid
Hand brakes	Adams Westlake No. 46
Heater equipment	Railway Utility Company cross-seat type
Headlights	U. S. standard 10 in.
Lightning arresters	General Electric
Motors	Four G. E. 34-hp., 600 volts, inside hung
Finish	Nitro valspar
Sanders	N-L air
Sash fixtures	Dayton roller and racks
Seats	Brill Winner
Seating material	Brown leather
Step treads	Stanwood steel step
Trolley base	G.E.-U.S.
Trolley wheels	General Electric
Trucks	Brill 77E
Ventilators	10 N-L exhaust with register
Wheels	26 in. diameter

$7,000,000 Earned by Westinghouse Air Brake

Net earnings for 1925 as shown by the annual financial statement of Westinghouse Air Brake Company, Wilmerding, Pa., after deducting all expenses, were $6,965,538. Of this amount, $5,532,328 was distributed to stockholders as dividends, and the balance of $1,433,210 was added to the surplus account. While the sales of the parent company and its subsidiaries were practically the same as in 1924, the consolidated shipments were considerably larger, due to the volume of the Union Switch & Signal Company's sales. The report states in part:

Among our many recent developments has been the air brake for automotive ve-

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hicles, which has been brought to a high state of efficiency. This company has already equipped several thousand trucks and heavy vehicles with this new type of apparatus.

Thus far during the current year the volume of orders received by the parent and subsidiary companies has been above the average and substantially over the corresponding period of the previous year, and with the large volumes of orders now on the books of our consolidated interests we are encouraged by the outlook for 1926.

Bids for 75 Cars Asked at Seattle

Seattle Municipal Railway, Seattle, Wash., has asked for bids on 75 new cars of modern type to replace heavier equipment now in service. The proposed additions to rolling stock will be of the lightest possible construction consistent with durability and will seat 58 passengers. They are designed for one-man, two-man operation, with the center-exit doors treadle operated. Specifications follow:

Principal Dimensions:	
Length over all	46 ft., 0 in.
Truck wheelbase	5 ft., 4 in.
Width over all	8 ft., 4 in.
Height, rail to top of trolley stand	12 ft., 11¼ in.
Interior trim	Mahogany
Roof	Arch
Air brakes	Westinghouse variable load
Bumpers	Anti-climber 5 in.
Car signal system	Faraday bells and buzzers
Car trimmings	Brass
Conduits and junction boxes	Duraduct
Controller	K-35-KK
Curtain material	Pantasote X2 color 74
Destination signs	Hunter illuminated
Door mechanism	Center door treadle operated
Energy-saving device	Economy meter, three dials
Fare boxes	Johnson—DM3
Fenders	Railway's standard with Ohio Brass life guard
Gears and pinions	Tool steel
Heater equipment	Consolidated No. 303
Headlights	Ohio Brass type Z
Motors	Four Westinghouse 510-A or GE-265, inside hung
Paint	Sherwin-Williams, Murphy and Old Dutch Enamel
Sanders	Air
Sash fixtures	Brass
Seating material	Spring cane
Trolley catchers	Ohio Brass
Trolley base	U. S.-15
Trolley wheels	Five inch
Ventilators	Sixteen small size
Wheels	U. S. or Bethlehem steel, 26 in., 3-in. tread, ¾-in. flange

$1,000,000 for Cars and Buses for Twin Cities

Plans made by the Twin City Rapid Transit Company, Minneapolis, Minn., call for the expenditure of $1,500,000 in 1926. Of this amount, $750,000 will be appropriated for building 50 noiseless street cars and $250,000 for purchase of parlor buses. The cars, which will weigh 25,000 lb., will be equipped with roller bearings throughout, will be provided with heating arrangement to keep the steps clear of snow and ice and will be equipped with pneumatically controlled doors, these supplanting the electrically controlled doors which were tried out on two test cars which have been operating continuously for the past two years.

Metal, Coal and Material Prices

Metals—New York	March 30, 1926
Copper, electrolytic, cents per lb	13.975
Copper, wire base, cents per lb	16.25
Lead, cents per lb	8.20
Zinc, cents per lb	7.45
Tin, Straits, cents per lb	63.00
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	2.025
Pittsburgh mine run, Pittsburgh, net tons	2.00
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6 25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.00
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.02

Rolling Stock

Chicago & Joliet Electric Railway, Joliet, Ill., has placed an order for ten interurban street cars with the Cummings Car & Coach Company, Chicago.

Union Transportation Company, Tulsa, Okla., has purchased two 25-passenger city type Mack buses. The company is a subsidiary of the Oklahoma Union Railway.

Nashville Railway & Light Company, Nashville, Tenn., plans to spend $135,000 for ten new street cars of modern type.

San Francisco, Cal. — Bids for six buses have been asked by the city and county of San Francisco through M. M. O'Shaughnessy, city engineer. The buses are desired for operation on the Embarcadero by the San Francisco Municipal Railway. Bids will be opened on May 5 by the Board of Public Works.

Washington Railway & Electric Company, Washington, D. C., has ordered fifteen 28-ft. 5-in. closed motor cars from the J. G. Brill Company, Philadelphia, Pa. The cars will be mounted on Brill 76-E1 trucks.

Gary Railways, Gary, Ind., has ordered five one-man, light-weight interurban cars from the Cummings Car & Coach Company, Chicago, Ill. The new cars are adapted for double-end operation. They will have an over-all length of about 45 ft. and a seating capacity of 46 and will have a streamline effect in appearance. They are to be equipped with four 35-hp. motors, air brakes and safety control and will weigh fully equipped approximately 37,000 lb. These cars will replace heavy two-man operating cars now in operation in Gary.

Northern Ohio Traction & Light Company, Akron, Ohio, has purchased through the Akron branch of the Mack-International Motor Truck Corporation six 29-passenger city type Mack buses. These will be put in service on a cross-town line, a route of 6 miles, at a 7-cent fare.

Boston & Worcester Street Railway, Worcester, Mass., has ordered three 29-passenger city type Mack buses for operation between Framingham, Marlboro and Hudson. It is understood that the performance of buses in maintaining schedules during the heavy February storms, when other means of transportation failed, was the deciding factor in the purchase of additional motor equipment.

Track and Line

Kansas City Railways, Kansas City, Mo., plans track improvements costing $32,578. A request has been filed in the federal court to rebuild 400 ft. of single track on the Holmes Street line and the realigning of 600 ft. of double track at 40th and Main Streets, where Main Street is being straightened.

Portland Electric Power Company, Portland, Ore., has just placed an order for 25,000 paving blocks to be shipped at once.

Nashville Railway & Light Company, Nashville, Tenn., will undertake a program of reconstruction and improvement of its tracks. For this purpose, $250,000 has been appropriated, to include paving a portion of the city streets required by the municipal government.

Trade Notes

C. E. Floyd has been appointed manager of sales in charge of the Chicago office and warehouse of Ludlum Steel Company, Watervliet, N. Y. He succeeds Mr. Edwards, who has been transferred to the Southern territory with headquarters at Houston, Tex.

L. N. Reed, for the last ten years in the railway electrification and heavy traction department of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has joined American Brown Boveri and will represent the company in the sale of electric locomotives and other similar equipment.

Harlan A. Pratt has been appointed manager of the oil and gas engine department of Ingersoll-Rand Company, New York, N. Y. Mr. Pratt was connected for many years with the sales department of the Westinghouse Electric & Manufacturing Company, later becoming sales manager of the Atlantic Elevator Company, exclusive agent in the East for the Westinghouse peerless traction elevator. He is a graduate of Stevens Institute of Technology and a former director of the American Institute of Electrical Engineers.

New Advertising Literature

Ohio Brass Company, Mansfield, Ohio, has issued a leaflet describing the manifold advantages of Flecto iron. Malleable-iron fittings made under special heat treatment are claimed to retain all their ductility, regardless of subsequent subjection to high or low temperature. The leaflet states that Flecto iron products are singularly impervious to the general wear and tear of railway service.

Mudge & Company, Railway Exchange Building, Chicago, have just issued revised specification sheets on both the Class W. S.-2, "Standard Section" motor car, and the W. S.-3 "Heavy Duty" motor car. Both of these cars are 8 hp., equipped with a single-cylinder motor, roller bearings throughout.

Electric Service Supplies Company, Philadelphia, Pa., has issued bulletin No. 220, describing and showing characteristics of Keystone expulsion-type lightning arresters. Arresters for every type of service from transformer protection to protection of ordinary lighting circuits are listed. Many charts and pictures are included.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 67 New York, Saturday, April 10, 1926 *Number* 15

Non-Voting Common Stock Condemned by New Jersey Commission

DISCUSSION of the advisability of permitting the issue of non-voting common stock has been raised anew by a decision of the Board of Public Utility Commissioners of New Jersey rendered on April 6. The applicant was a bus company, but the decision was made on the basis of that company being a public utility. The commission ruled against permitting the issue. Not only did it so hold with respect to the common stock, but it ruled similarly with respect to the 7 per cent cumulative preferred stock, an issue that did not provide for voting power at any time. The board took cognizance of the fact that the issue of common stock with no voting power might be in accordance with the corporation act, but it disagreed with counsel for the applicant that compliance with the provisions of the corporation act in the issue of this class of stock left the board without further discretion in the matter of giving its approval.

Under the present circumstances it does not matter whether the position taken by the board on the last question is tenable. The important point is that the decision follows the reasoning in the recent ruling by the Interstate Commerce Commission in the so-called Nickel Plate consolidation, and that it is in line with the objections raised recently by Professor Ripley in a protest that reached President Coolidge.

Not all the economic and financial aspects of the matter can be here considered, but a few of the more significant ones deserve attention. Professor Ripley's principal fear is best described by what he has termed "the alarming divorce of ownership of property, represented by securities emitted by corporations or trustees from any direct accountability whatsoever for its prudent and efficient management." There is no need to follow all the objections raised by the New Jersey Commission. The substance of the New Jersey ruling, the I. C. C. decision and the objection of Professor Ripley is the deprivation of the owners of a voice in management. On one occasion in commenting on the willingness of investors supinely to submit to domination of their companies by minority he asked how there could be other than a whirlwind of abuse and power under such conditions.

The points made by the advocates of this view are pretty well known. The subject is certainly debatable. As indicated before it is not the intention here to attempt to marshall the arguments for and against. It does seem, however, that there is much to the point that in the last analysis the stockholder is not really the proprietor he has been led to believe himself to be. No personal liability attaches to him. He has in the past often been just as supine with all his voting rights as he is presumably forced to be supine under the non-voting rule. It has even been argued that in the case of non-voting stock responsibility is even more firmly fixed than when voting rights are extended to all.

There are many points in the New Jersey decision of interest to the economist, the utility operator and the investor. On some of them made by the commission the ELECTRIC RAILWAY JOURNAL finds itself in agreement, but the feeling is irresistible that it cannot be said that one system is wholly good and the other wholly bad. The idea of non-voting stock with full responsibility vested in the management is the philosophy behind one of the biggest groups in the utility field, a group that has been unusually successful from the standpoint of what it has been able to do for the investors and the public. Certainly in the case of public utilities the state has a very large voice in saying what they shall or shall not do, and it is reasonable to assume that this regulative authority is exercised in both the interest of the security holder and the public. But there again is another anomaly, for the very decision under review is by a state body. As indicated before, the judgment of that body is that a substantial investment of the kind proposed to be made would not be in the public interest, and at the same time contrary to the policy of regulation.

The Broadening Conception of Local Transportation

TRANSPORTATION is one of the most important elements in the complicated machinery of modern life and business. But important as is the matter of long-distance transportation of materials and finished products between their sources, points of manufacture and distribution centers, the problems of this phase of transportation are being overshadowed by the situation within great industrial and commercial communities. The losses and waste in what may be classed as purely local transportation of people and commodities are a staggering load on business.

Setting aside for the moment all considerations of convenience, comfort and safety, and viewing the subject solely as a matter of economics, community transportation today presents an appalling situation. Although industrial efficiency has won for America its present position of world leadership, jamming of the local transportation mechanism threatens the future. Overlapping and duplication in the many forms of transportation for both passengers and commodities within industrial areas is causing a large part of the difficulty. Stand for a moment at any busy city street intersection and consider the cost of the lack of co-ordinated transportation facilities!

Here is a challenge to American initiative and resourcefulness. There is in this condition a community problem that has not been adequately recognized. Present conditions have been largely brought about by failure to consider local transportation as a whole. Street cars, elevated lines, subways, steam road commutation service, buses, taxicabs, private vehicles and the multitudinous deliveries of goods and commodities within the metropolitan areas of large cities make up the complicated traffic that attempts to use—with little

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co-ordination and much overlapping, interference and waste—the limited arteries that are available.

Those responsible for the operation of these various transportation agencies are primarily electric railway men, steam railway men, bus men, taxicab men, truck men, etc., rather than local transportation men. The narrow viewpoint of the past has caused each agency to endeavor to work out its own destiny independently of the others. The result has been little short of chaos.

The solution lies in a broadened perspective of the community transportation problem. Local transportation men of the future will fabricate from the many diverse and overlapping agencies, a co-ordinated structure fitted to the needs of modern cities. They face a complicated and difficult task, to be sure. To master it they will need to strip themselves of the fetters of precedent and self-satisfaction. But in this broadened conception of local transportation as an industry lies opportunity adequate to compensate for the imagination, courage and effort required.

Parked Automobiles Make for Ugly Streets

VISITORS to this country frequently see our American institutions from an unfamiliar angle and the comments made by them are often worthy of reflection. Among such are the words of John Drinkwater, the noted English playwright, a recent visitor here who commented as follows on the rapidly growing cities along the shores of our Great Lakes: "The central business part of the town is in nearly every case intolerable; . . . the streets are an inferno of parked and moving motor cars; but the outer districts of the town are nearly always beautiful."

This looks suspiciously like a new angle on one of the street railway man's biggest bugaboos, the parked car. It is here being berated for its unseemly appearance. It cannot be that a parked car looks any worse than a moving vehicle, especially if it be new, expensive and shiny. The moving vehicle, too, comes in for its share of criticism but this is probably because of its hampered motion, for it is not likely that one can find anything ugly about a moving vehicle itself. So this lack of beauty must lie in the mixture of the two types, or rather in the resultant confusion.

It seems that everything has been tried to keep things moving in the congested centers. Numerous traffic officers direct movements. There are elaborate signaling devices; everything goes or stops with the changing lights—until somebody trying to get into a parking space gets crosswise in the street, and all the beautifully planned synchronism is so much paper talk until the offender can slowly get himself into line again. Multiply this one incident by a half dozen or so and the number of "disorders" that occur in one block may be visualized. Add to this the number of improperly parked automobiles along the streets—vehicles that are left several feet away from the curb at odd angles, and whose over-all width is dangerously near the legal limit—and you have some idea of what causes disorder and what makes roadways in our active business centers an "inferno of parked and moving motor cars."

No doubt John Drinkwater would admit that there can be nothing but beauty in the rhythm of orderly traffic movements. Those who operate street cars and buses know the economic need of regular traffic movements; the patrons expect such regularity. But until some way can be found of getting rid of the old friend "the parking problem" there is going to be considerable difficulty in keeping out ugliness from the wheeled traffic movements on busy streets.

Where $500 Would Be Worth More than Millions

CONSIDERABLE difficulty had been experienced by a certain local improvement association in attempting to focus the attention of the street railway on a road crossing at a particularly heavy intersection. The improvement association had been able to get a few loads of gravel or stone dumped around the tracks from time to time, but never had impressed on the management the value of making a permanent repair. In consequence every vehicle that goes across the track at this point is subjected to a series of bumps that is unpleasant if nothing worse.

The matter was brought up at the regular meeting, as it had been many times before. After the usual castigation of the railway, one speaker summed the matter up by saying, "This railway company has spent millions on improvements that have obtained for it less good will than it would have got by spending $500 at the avenue crossing."

Here in a nutshell was a lesson in public relations that should have meant much to this company. It was typical of its management to oppose as a matter of form the requests not only of this improvement association but of all the others. Gradually the public has come to expect nothing without a fight, and in return has adopted the attitude of conceding nothing without a struggle. True, the company contends that if it gave in to all the requests of all the improvement associations it would be bankrupt. Perhaps that is so; but that is not a valid reason for adopting the attitude of antagonism at all times. It would at least be possible to meet the public on common ground, to discuss the problems of the company, which are also the problems of the public and the local improvement associations, fairly and freely, and to give the public what it thinks it wants when that can be done without a great sacrifice. The return in good will and relief from onerous conditions of operation would pay the cost many times.

Selection and Training of Personnel Presents Opportunity for Large Economies

SUFFICIENT time has not yet elapsed to obtain a true measure of the value of the personnel selection and training methods recently put into effect by The Milwaukee Electric Railway & Light Company. It is reasonable to expect that savings to the company will result from fewer accidents, as well as lower costs in settling accidents, because the men operating the cars eventually will be of higher grade through the operation of scientific selection methods. Likewise a distinct monetary saving should be effected from the reduced cost of labor turnover. It probably costs $200 or more to break in a new trainman. For every time the hiring of a misfit can be avoided, at least this initial expense can be saved. Then, too, after employment, more efficient training, better follow-up methods and broader educational policies will do much to cause the employee to grow in value.

President S. B. Way, in commenting on the value of psychological selective tests used in the employment of

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men and women of his company, gave a very interesting comparison. He said that he, like many other railway officials, was moved to ecstasies when the company was able to accomplish, say, a 5 or 10 per cent saving in its power account. Due to the progress of the art of generation and distribution, many such savings have been made possible in recent years. At best, however, the entire cost of power is only a quarter of the total of operating expense.

During all these years far too little attention has been paid to improving either the selection or the education of the personnel. On a property such as that at Milwaukee personal services will absorb at least 50 per cent of the operating costs. From Mr. Way's experience, he believes that there are far greater opportunities for effecting monetary savings as well as more tangible improvements in the service through better methods of selection before employment, and better training and education during the years after employment of the men and women who make up the operating staff.

In this issue is a story on the personnel selection and training as now practiced in Milwaukee. The time is yet too short to draw an adequate account of the savings possible. The direct saving due to lower labor turnovers is, of course, self-evident. The saving due to reduced accidents is one that will not be evidenced for many months to come and then the palm may be claimed by many departments who are contributing along the lines of safety and better operating methods.

London Experience Shows Necessity for Bus Regulation

FAIRLY general agreement exists today among experienced railway and bus men that mass transportation is not the true field of usefulness for the bus. Many people outside the transportation industry, on the other hand, do not understand this, and look upon the bus as the ultimate successor to the electric railway. They have a vague notion that buses are carrying millions of passengers in London and that they could do the same thing in other places.

London, however, has discovered that the operation of buses to handle mass transportation is not all "skittles and beer." With more than 5,500 buses licensed to operate when and where they please, congestion of traffic in the streets has become intolerable. Tramways have been nearly bankrupted. The rapid transit extension program has been halted by the inroads of the buses.

Drastic cuts in the bus service have now been ordered by the public authorities, as told elsewhere in this issue. The object of this action is twofold—to relieve traffic congestion and to protect the tramways. Since the service is to be curtailed on nearly all important thoroughfares, regardless of whether or not tramways are operated on them, it may be inferred that relief of congestion is the primary consideration. Protection of the rail systems nevertheless is regarded by the authorities as a matter of great importance.

Advantages of the tramway over the bus in several important respects account for this solicitude on the part of the public officials. The cost of operation of the tram per vehicle-mile is less for a greater passenger carrying capacity. The schedule speed is over 9.5 m.p.h., somewhat higher than that of the buses. Through the operation of an archaic agreement the trams transport workmen at special low rates at hours when the buses are not operating. Moreover, they pay huge sums in taxes—far more than do the buses. Under these circumstances the authorities feel that it is against public policy to permit the continuance of the unrestrained competition that has nearly ruined the tramways.

Curtailment of bus service alone is not expected to solve the problem. The possibilities of co-ordination between the bus and rail services under a single management are now receiving careful consideration. Thus, London, instead of being an example to prove the success of the bus in mass transportation, in reality demonstrates its limitations. Moreover, the present situation there confirms the theory held by transportation men in this country that co-ordination is the best way out of the difficulty.

New Jersey Bus Situation Stabilized by Recent Legislation

MARKED improvement in the bus situation in New Jersey is to be expected to result from the recent passage of two bills by the State Legislature and their approval by the Governor. All buses having carrying capacity for more than six persons (except hotel and school buses) are now classed as public utilities and made subject to the jurisdiction of the Board of Public Utility Commissioners.

Previously the commission had jurisdiction only over buses which operated in whole or in part on the same streets with electric railways. To run on such streets it was necessary for a prospective bus operator to secure a municipal permit and a certificate of convenience and necessity from the commission, but if he could juggle his route so that it never actually paralleled a railway on the same street he escaped the "convenience and necessity" provision under the old law, although a municipal permit was always a requirement. By this subterfuge many bus lines were established in competition with railways and without the existence of any real transportation demand. Henceforth, however, all buses in the state, wherever operated, will be subject to commission regulation as to service, fares, etc. New lines can be established only when and where there exists a real need.

The new legislation also promises improvement in the matter of franchise taxes and municipal license fees. It is provided that 5 per cent of the gross receipts shall be paid to the municipality in which the bus operates in lieu of all other franchise taxes and license fees. In the case of a route running through several towns, the payments shall be made in proportion to the route mileage in each municipality, the total to amount to the 5 per cent already mentioned. In the past, this arrangement was in effect only in the larger cities. Elsewhere it was the practice of the municipal authorities to charge whatever license fees they saw fit. Permits were granted for comparatively short periods only, and frequent disagreements arose concerning increases in the fees whenever it became necessary to renew licenses. All this has been eliminated by the new law. The permits once secured and approved by the Public Utility Commission can be revoked only for cause and with its sanction after hearing.

For the railways the result will be better protection against unfair competition than has existed heretofore. For the bus men the new legislation means stabilization of their business and an assurance that they can continue their operation from year to year without fear of sudden and unreasonable increases in their license fees.

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Personnel Selected and Trained in Milwaukee on Scientific Basis

By John A. Dewhurst
Associate Editor ELECTRIC RAILWAY JOURNAL

Psychological Tests, Upon Which Selection or Rejection Is Based, Now Given to Prospective Employees — Different Tests Used for Each Class of Employees Based on Job Specifications—Importance of Personality Interview and Subsequent Training Stressed

PSYCHOLOGICAL tests coupled with personality interviews by a trained psychologist are the features on which great stress is laid in an extensive training program developed by the Milwaukee Electric Railway & Light Company. Following these selective tests is a more thorough training of prospective employees. Even after a platform man has been "turned in" and is in regular service follow-up checks and examinations are made by the instructors—first daily, then weekly and later monthly. After the end of six months yearly checks and reports are made. Every check so made is sent to the office of the supervisor of training, where it is transferred to a permanent card record. The psychologist also keeps a record for eighteen months to check the value of these tests.

At the present time more attention has been paid and more experience has been gained in the testing of motormen, because it was early felt that this class of employee, due to the accident hazard, has in his control the greatest financial liabilities. From the experience gained during the early development stages the company is now extending the psychological features of employee selection to bus drivers, conductors, one-man operators, shop apprentices and miscellaneous employees. Also, competitive tests for promotion are planned. Even the difficult position of schedule maker is being studied in order to define the qualities of paramount importance necessary in a man destined to perform that work. Most of the efforts, so far, have been confined to applicants for railway employees except that all accountants, clerks, sales clerks, stenographers and meter readers must be examined by members of the staff under the supervision of the psychologist.

Applied psychology is introduced as an intermediate step in the engagement of new employees to aid in the decrease of labor turnover and to improve the

EDITOR'S NOTE

APPLIED industrial psychology is a new art, dating back only a few years to the early work of Hugo Münsterburg. It was in 1912 that he first suggested and designed tests which would aid in the selection of electric railway motormen. While many railway properties in this country have done experimental work from time to time along these lines, it is believed that The Milwaukee Electric Railway & Light Company has made the most extensive studies along these lines of any property in this country, culminating in the actual application of these principles in the practical work of employing new men.

At the outset, it is not the intent of this article to present a treatise on industrial psychology or a historical sketch of its early development. Such data may be found in articles by Morris S. Viteles, appearing in the *Journal of Personnel Research* of July and August-September, 1925. In the October issue of that magazine, Dr. Sadie Myers Shellow presented a treatise on research in selection of motormen in Milwaukee.

So far as is known to the editors of this paper, the first public suggestion for the psychological analysis of the duties of motormen appeared in an editorial in ELECTRIC RAILWAY JOURNAL of Feb. 10, 1912. In discussing ways to reduce accidents, this editorial said:

"It has been suggested that some new ideas might be developed if the entire subject was analyzed by what is now known as the laboratory methods of psychological investigation. There seems to be no reason why experimentation should be less successful in this branch of human knowledge than in the others where it has been tried."

Martin J. Insull, president of the Middle West Utilities Company, then actively engaged in electric railway management, inspired the thought just quoted. In the issue of ELECTRIC RAILWAY JOURNAL for Feb. 17, 1912, was published a letter from Mr. Insull, in which he urged the study of the problem from a scientific standpoint. Shortly after, largely through the influence of Mr. Insull, a group of prominent psychologists met in New York to consider this question.

One of this group was Prof. Hugo Münsterburg of Harvard University, who expressed the belief that psychologists could help in the problem. Shortly after he began some experiments on the Boston Elevated Railway to determine the qualities necessary for the position of motorman. These experiments are described in detail in a chapter in Prof. Münsterburg's book "Psychology and Industrial Efficiency," published in 1913.

The next contribution on this subject was in an article by G. W. Gerhardt, superintendent of transportation, of the Dallas Consolidated Electric Street Railway, published in the ELECTRIC RAILWAY JOURNAL of May 20, 1916. This article was read before the Southwestern Public Service Association by Mr. Gerhardt. Mr. Gerhardt is now with the Milwaukee company and is greatly interested in the selection tests used on that property.

The next conspicuous example of the application of scientific principles in the selection of employees was in a paper read by M. McCants in 1922 before the American Electric Railway Transportation & Traffic Association. The paper was printed in the JOURNAL, Oct. 21 and 28, 1922. At the same meeting a report was presented by the committee on personnel and training of transportation department employees. It contained two valuable appendices, one contributed by Dr. Leeming of the Chicago Surface Lines and the other by Dr. A. J. Rowland of The Milwaukee Electric Railway & Light Company.

Another example of applied psychology was a series of tests designed for selecting taxicab drivers. An account of these tests by Dr. A. J. Snow was published by ELECTRIC RAILWAY JOURNAL, Sept. 13, 1924.

Abroad, the European electric railway companies have been quite as active as American companies in developing tests to determine the suitability of applicants for positions as trainmen. A most extended account of the methods followed in Paris will be found in an article by L. Bacqueyrisse of the Paris tramway system in ELECTRIC RAILWAY JOURNAL for Aug. 23, 1924. An account of the tests used for selecting motormen in Berlin will be found in the issue of the JOURNAL for Jan. 28, 1922.

In this present article it is intended to give a practical presentation of the selection and training methods employed by The Milwaukee Electric Railway & Light Company with particular reference to the work performed in the psychological laboratory. The equipment used in selecting motormen was suggested in part by Morris S. Viteles, during his part time engagement on the Milwaukee property in the years 1920 and 1921. The actual apparatus was designed and constructed under the supervision of Dr. Arthur J. Rowland, educational director of this railway company, and Walter J. McCarter.

For the past year Dr. Sadie Myers Shellow has been engaged in the work on a full time basis and has developed and standardized many tests based on an analytical study of the various jobs on the property. The work has passed the experimental stage, and new employees are now scientifically selected.

It seems particularly appropriate that this scientific selective work should be performed with the proper relationship, not only to the employment service, but with the educational department as well. Dr. Rowland is interested in its research aspects as well as its relations to the employment department.

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average of men and women selected. This phase of the work is either performed by a trained psychologist or the tests are designed and standardized by the psychologist and administered under supervision for the less important classes of employees.

The examination consists of interviews, various kinds of standardized tests based on scientific principles, and in the case of motormen a mechanical test that is designed to indicate the applicant's possibilities along four lines, as follows:

1. During the training period of the mechanical test, described later on, the length of time required to form new habits is determined.

2. Distribution of attention and selective response are determined by the ability to attend to several signals amid distractions and to select the proper response to given signals.

3. The reaction time of such response under normal conditions is accurately measured and recorded.

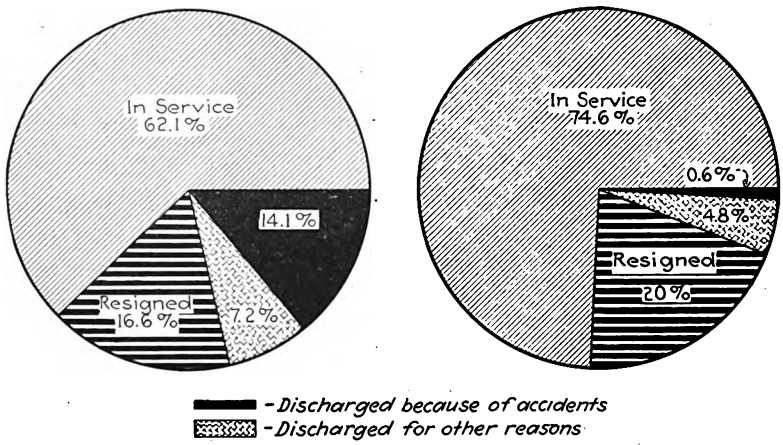
4. The ability to co-ordinate hand and foot actions to eye and ear signals is determined.

All of these responses are then scored and compared with standards that have been previously prepared from similar examinations of men long in the service whose operating characteristics are known and whose ability has been rated by supervisors and others qualified to pass judgment on these men.

Before the examination of applicants for a definite position can take place, the psychologist must know the specifications of the work required. Then appropriate tests must be designed which will quickly bring to light the desired characteristics. Following this, old employees must be examined in order to determine the adequacy of tests from their known characteristics, and critical score and acceptable range are determined.

Nearly every employer of labor either consciously or unconsciously uses a form of psychology in the judging of applicants. It is an entirely different matter, however, to apply scientific principles to predict the possibilities of an applicant, to weed out the inefficient and to recommend those having definite reactions favorable to the proposed requirements. Another important factor of this work is to determine the best job for the applicant. For instance, a recent applicant for the position of motorman showed characteristics better suited for a bus operator. The applicant was persuaded to try for this position and proved successful.

In common with many other companies of this type about 50 per cent of the operating expense is for payrolls, since labor is the largest commodity purchased. A saving of only a small proportion in this account is thus reflected as a relatively large amount of money.



Tangible Results of Scientific Methods in the Selection of Motormen

These two diagrams show the accomplishments made through the scientific selection of motormen on the property of the Milwaukee Electric Railway & Light Company. The most significant figure is the reduction in men discharged because of accidents—in 1924 from 14.1 per cent to 0.6 of 1 per cent in 1925. Aside from this there has been a marked reduction in turnover as a whole. Other data in table on page 626.

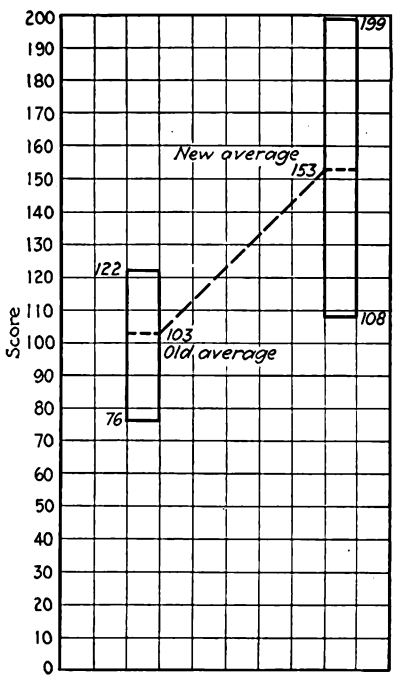
The accompanying chart shows the most distinctive indication of the results accomplished during the first year that selective tests have been used. During the year 1924, motormen were not selected by test. For the full year 1925, every motorman was selected in the manner explained in this article, this test being inserted in the regular program following the customary doctor's examination and preceding the "breaking in" period. The results show that out of practically the same number of new employees hired, only one had to be discharged because of accidents as against 23 the year before.

The figures included in the chart and table are comparable, because for 1924 only those motormen are considered who were hired during the year. The status of these men at the end of the year is the basis of the statistics. The same classification was followed for 1925. For both years industrial and other conditions were essentially the same.

The most significant figures are those of men discharged because of accidents. Only one of the selected motormen was discharged for this reason, as against 23 of the unselected men the year before. By spending one hour with each applicant the turnover due to this cause has practically been eliminated. Other important improvements in results can be noted from the table and chart drawn to visualize these results.

It is natural to expect that the accident costs will be reduced. The number of selected motormen is yet too small a proportion of the total in service to permit drawing conclusions. A study of this situation is being made and perhaps a year from now indicative data may be available, which will give tangible evidence of the value of these tests.

To visualize the selective and training methods as practised by the Milwaukee company, the writer made application in the usual way for the position of motorman. A résumé of his examination and training per-



Records of New Clerks Improved 50 per Cent Over Old Average

Tests of speed and accuracy of applicants for clerical and accounting positions have raised the average from 103 to 153. The old average is for the clerks who received the tests and who had been in service for a long period. The new average of 153 is for new employees hired during 1925 with the help of the selective methods.

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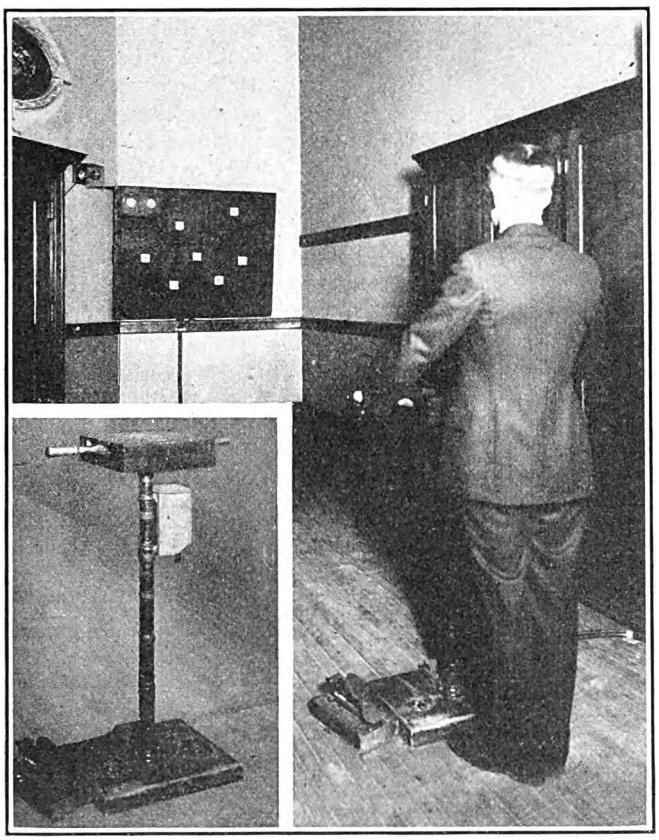
haps will best serve to explain and interpret the operation of the system.

Upon application to the employment department the prospect is requested to fill out a form stating name, age, certain physical characteristics, home and marital condition, previous employment and associations. He is also asked to give several names as references. Following this the employment agent talks with the applicant, explaining the duties of the position of motorman, the hours it requires and the advantages and disadvantages of the job. This is a service to the applicant who may have only a hazy idea of the work for which he has applied. The applicant then undergoes a medical examination, for eyesight, color blindness, hernia, hearing and major physical defects.

Following this procedure the applicant is scheduled for test and examination by the psychologist. This test



An Applicant Taking the Motorman's Test Used in Milwaukee for Selecting Candidates for Motormen

The seven irregularly-placed squares on the board ahead of the applicant flash on and off at a regular frequency. At certain times, one of the four events described in the article occurs requiring a prompt action which is measured on the record tape. The insert shows the stand with the two handles and the two foot contacts. The larger pedal to the left is part of an auxiliary test for response to fright, not being used at the present time. At one period during the test, a motor with a ratchet wheel playing against a metal strip, is started. At the same time a flash is produced in front of the operator's eye, the instruction being to open the switch seen under the stand and to depress the large pedal. This is a test of action under emergency conditions.

is given in the laboratory with no other person present except the subject and examiner. The simplicity of the surroundings and the total absence of any interference of a distracting nature allows the uninterrupted and complete concentration held so valuable in a scientific examination of this kind. The psychologist first interviews the applicant by asking a number of simple questions relative to the applicant's economic status, his habits, why he wants to be a motorman, what he did previously, how he liked it, why he wasn't satisfied, etc.

EMPLOYMENT RECORD OF MOTORMEN SHOWING REDUCED TURNOVER FOLLOWING PSYCHOLOGICAL EXAMINATION

	1924 Not Given Psychological Examination		1925 Selected by Psychological Tests	
	Number	Per Cent	Number	Per Cent
Motormen employed during year...	163	100	166	100
In service end of year.....	98	60	119	72
Out of service end of year.....	65	40	47	28
Changed to conductor.....	3	1.8	4*	2.4
Resigned.....	27	16.6	33	20.0
Discharged.....	35	21.5	10	6.0
Due to accidents.....	23	14.1	1	0.6
Due to other causes.....	12	7.4	9	5.4

* Of the four that changed to conductor three originally were recommended as conductors and one, was recommended as motorman. See charts on page 625.

Then more complicated questions are asked as to what would he do if confronted with certain situations, some of them common occurrences and others involving accidents. The answers are important in that they show common sense, ability to think and rapidity of thinking rather than exact procedure, as the applicant up to this time has had no training as to company rules and approved procedure. This preliminary talk requires from ten minutes to half an hour.

The motorman selection test is then given. The applicant stands before a pedestal shown in an accompanying illustration and grasps the two handles, either of which may be moved freely and independently forward or backward. In addition there are mounted on a platform two pedal contacts whose operation requires raising one foot or the other slightly. Every individual movement is electrically recorded by an apparatus placed just behind the applicant, so that each time either handle is moved forward or backward or either foot contact is depressed an individual number is printed on the moving record tape. In this way six different movements, numbered 1 to 6, may be recorded.

About 20 ft. ahead of the applicant is a blackboard 4 ft. 8 in. x 3 ft. 9 in. in size. As shown in an illustration, seven square holes appear in an irregular manner. Each may be illuminated from the rear by an electric lamp. Each square opening is covered by a piece of green glass so that when the light is burning the square is illuminated.

The sequence of events that happen during this test is controlled by a card tape cut like an automatic piano roll and which is driven at a predetermined speed. The operating mechanism of which this is a part is contained in the cabinet behind the subject and is of no interest to the man being tested. He controls his record only, consisting of the printing mechanism operating on the second paper tape, electrically driven at the same speed as the controlling card tape. The subject is not directly conscious of the mechanism or that the record is being made.

The first part of the examination is the training period lasting twenty minutes, and the second period is the test proper lasting six minutes. There are four things that may happen. If a bell rings the operator is instructed to thrust both handles forward and immediately back to the normal position. As an indication to the applicant (and also to the examiner) a red light is flashed in one of the upper left-hand round holes on the board. If a horn sounds the applicant is instructed that he must move the left handle toward him and the right handle away from him. When this is done a blue light flashes in the second round aperture.

If the illumination in the extreme left-hand square fails to appear when the others do, then the applicant is instructed to pull both handles toward him quickly

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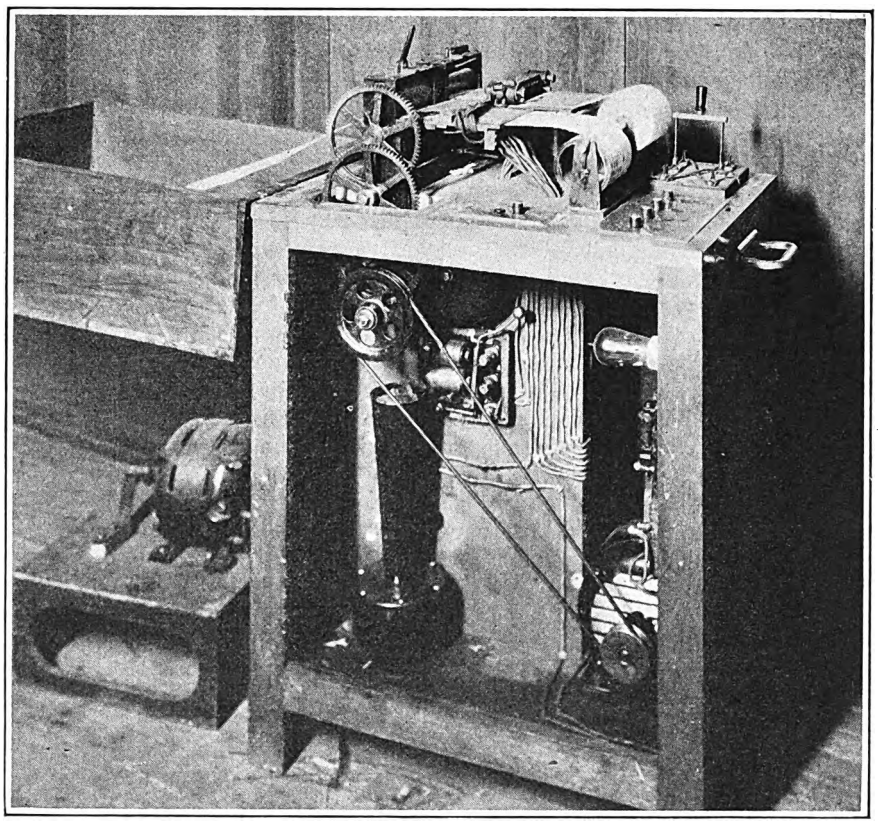
and at the same time depress the left pedal with his left foot, immediately resuming his normal position. If only the handles are pulled back then only one diagonal half of the square becomes illuminated, and if only the pedal is operated then only the other diagonal half is illuminated. Both actions must be accomplished simultaneously to perform the desired result. Fourthly, if the upper right-hand square fails to illuminate then the operator must move the right handle forward, the left back and depress the right pedal with his right foot. The operations then performed indicate by illuminating each half of the square in a manner similar to that mentioned.

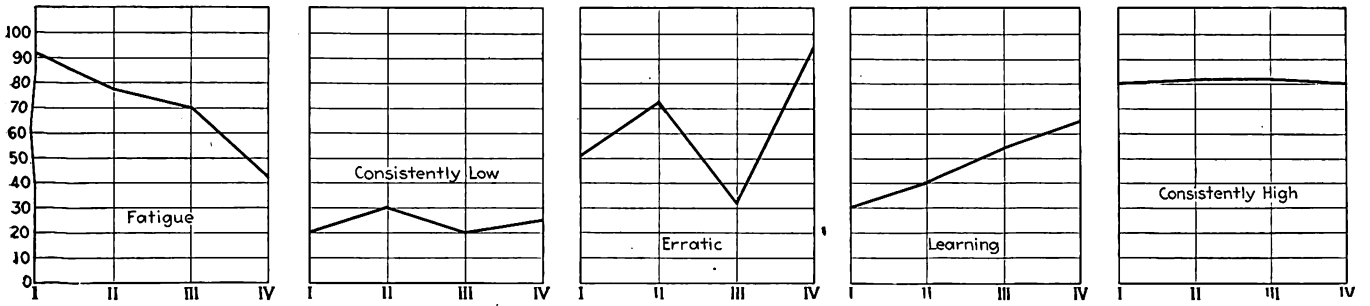
During the practice or training period the applicant is given experience in operating each one of the four events separately. The mechanism flashes all the square lights on and off during the training period at the rate of 25 flashes per minute. At certain regular intervals, just as a flash comes on, the bell will ring directing the operator to make the appropriate move. During the second part of the training period similar practice with the horn is obtained. During the third part habit-forming training is obtained when the left-hand square fails to become illuminated and the fourth part when the right-hand light fails. Thus there are two auditory events or stimuli and two visual stimuli, each requiring different operations on the part of the applicant being tested. The final portion of the training period is an alternation of all four signals at regular intervals.



The Operating Mechanism. An Electric Motor, Through Gearing, Drives Two Tapes, One Cut Like a Piano Roll, Which Produces the Sequence of Operation of Light Flashing and the Audible and Visual Signals. The Other Tape Is the Record Tape, on Which the Applicant Automatically Records His Operations

After the training period the operator is allowed a relaxation period of three minutes, when he is told that during the next series he will be tested, and that any of the four events will happen irregularly but only one at a time. The appropriate movements of levers and pedals must be made. The rhythmic flashing on and off of the green lights is increased to 40 cycles per minute. One other thing happens at occasional intervals during this test period to produce distraction. A large white light near the upper left corner of the board has heretofore been dark. A few times during the test period this flashes on with the green lights. The first time nothing else happens, so that no movement is required on the part of the operator. At other times the bell sounds or one of the green lamps fail to light, calling for a movement by the operator. His reactions at this surprise are noted both on the tape (if he moves a lever or a pedal) and also by the examiner giving the test. Also at predetermined intervals the person giving the test asks a simple question, such as "Did you see that light?"—a distraction common to a motorman when a passenger asks a question.

The test ends. The record is then analyzed. About 5 yd. of paper for the training period is set aside for possible research later. The test section, more than 2 yd. long, is scrutinized by placing over it a transparent template with correct markings. Errors are counted and a score is determined based on a predetermined schedule. A score of 50 is just passable. Below 50 the applicant generally is rejected, except in certain unusual cases. If the score is above 50 the applicant is recommended unless the psychologist has found him lacking or deficient in the personality interview. Both the test and interview are considered essential elements



Analysis of Motormen's Test Record Indicates Characteristic Tendencies

Analysis of the six-minute motormen's test with the mechanical equipment indicates not only an average score but certain other characteristics as shown in the five curves above. The average for the first curve might be high, yet the indication would be that the operator became fatigued and this characteristic would have to be watched most carefully during his training. The third curve for the erratic applicant might have meant that he was careless or easily distracted.

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in the examination by the psychologist and approval is based on judgment and not on arbitrary records.

The analysis, besides showing the total score, shows the score for each quarter of the selection tests. Interesting conclusions are drawn from these data. Several typical analyses are reproduced in charts on page 627 to show representative cases.

During the time required to calculate the score, an observation test is made. The applicant is given a picture to study showing an accident between two automobiles as reproduced in the illustration below. A car, several police officers, an ambulance, a crowd, a clock and many extraneous details, such as street and advertising signs, are shown. The picture is studied for two minutes and then the applicant is given a list of 40 questions which he must answer concerning the details in the picture. The answers are likewise scored on a predetermined schedule and are considered an element in the final score depicting the power of observation.

The applicant has now spent perhaps an hour to an hour and a half in the laboratory. If approved he is sent back to the supervisor of instruction. During the interval required to deposit the $5 necessary to cover property loaned by the company, the supervisor fills out an introduction card to the chief instructor which he gives to the applicant with instructions to report at the next regular class of apprentice motormen. Under sealed cover the supervisor of training, also versed in the psychological test methods, interprets the psychologist's score and recommendations into direct instructions to the chief instructor, a representative example reading as in the recommendation shown above.

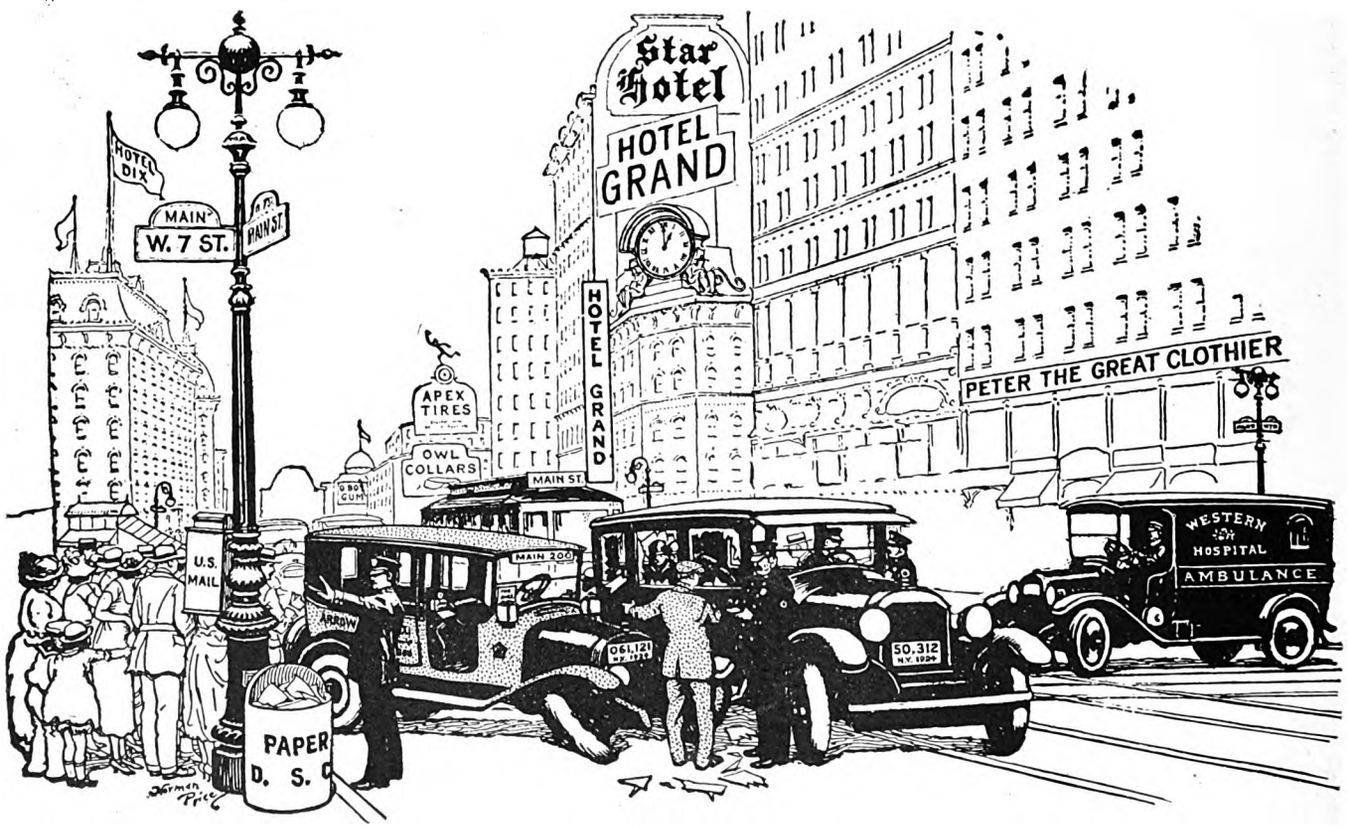
From this point on the applicant becomes a student motorman and is under the direction of the transporta-

Recommendations to Chief Instructor

Selection Test Score: A B C D E (×)

Needs for Special Training: This man allows his attention to wander and will have to be watched in this matter. He is easily distracted and will have to be warned about watching the job. He should learn quickly. His actions quickly became automatic, so see that he has the proper emergency training.

SUPERVISOR OF TRAINING.



Observation Test Given to Applicants for Motormen in Milwaukee

The applicant is instructed to look at this picture intently for two minutes and then is given this list of questions to answer. The score is based on the accuracy, number answered and time required. Try this yourself and measure your own power of observation.

Questions

1. What was the time of the accident?
2. In what year did it take place?
3. Where did it happen?
4. What was the collision between?
5. Did the taxi run into the limousine or the limousine into the taxi?
6. What was the name of the taxicab?
7. What was the telephone number on the windshield of the taxicab?
8. Was the limousine light or dark colored?
9. Were the front wheels of the limousine damaged?
10. Was the glass in the limousine shattered?
11. Was there a passenger in the taxicab?
12. Where was the taxicab driver?
13. Where was the driver of the limousine?
14. Were there any passengers in the limousine?
15. What was the name of the clothier in the picture?
16. Was there a flag in the picture?
17. What was the name on the ambulance?
18. Was it summer or winter?
19. How many policemen did you see?
20. Was there a mail box in the picture?
21. What was the license number of the car?
22. What was the license number of the limousine?
23. Was the cab driver wearing a light or dark suit?
24. Was he wearing a hat or cap?
25. Was it raining?
26. How many light globes were there on the lamp post?
27. Was there a traffic sign in the picture?
28. Was the driver of the ambulance in his seat?
29. Was the victim of the accident on a stretcher?
30. How many stretcher bearers were there?
31. Was there a trolley car in the picture?
32. On what street was it running?
33. Was the taxi driver knock-kneed?
34. Name the hotels in the picture.
35. Was there a theater in the picture?
36. What play was running?
37. Who was the star?
38. Was there a flour advertisement in the picture?
39. What brand of tires were advertised?
40. What brand of collars were advertised?

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tion department. The student enters a class of from four to eight, preferably four, and receives talks by the chief instructor in the school room at Fond du Lac station. Samples of the various types of controllers are set up, simplified car wiring details and air-brake diagrams are explained, instructions and practice in operating controllers and air brakes and hand-operated door mechanisms are given to acquaint the student with the "feel" of each type of equipment. A practice trip is then made on certain routes requiring about 2½ hours, and each student is allowed to operate the car in turn.

Later other classroom instruction is given on the subjects of meter cards, car condition reports and accident reports. Great stress is laid on the proper methods of filling out accident reports, getting witnesses in all cases and other essential details. Two days are spent in this way with the chief instructor.

The student is then assigned to a regular instructor, a motorman in regular service who has been specially trained in instruction work. Here again is an essential difference in the Milwaukee methods. Motorman assigned to instruction duty in conjunction with their regular work must select certain runs known as "student instruction runs." On these runs certain types of

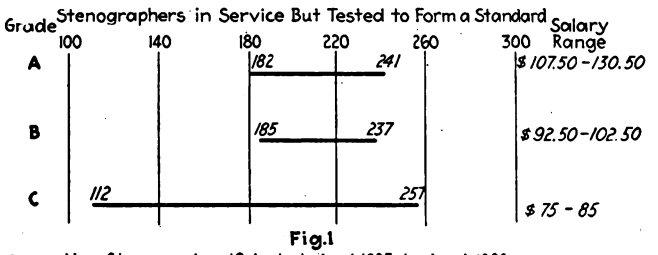

Fig. 1

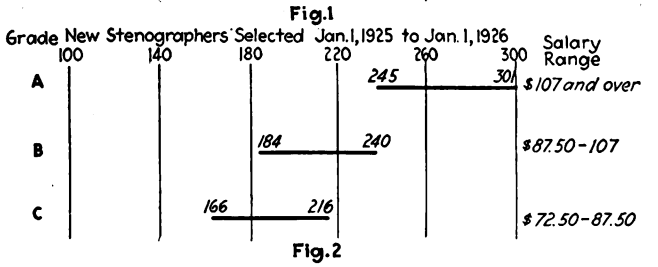

Fig. 2

This Chart Shows a Better Classification of Stenographers Due to Selective Methods Used at Milwaukee

Fig. 1 above shows the status of the stenographers in the service of the Milwaukee Company as tested by the psychologist, and it is here seen that the third class or lowest salary range stenographers had the worst and also the best standing. Compare this with what is shown in Fig. 2, in which the three grades have become separated—those stenographers having a higher rating receive the highest pay, and the lowest grade the lowest salary.

equipment are used. The student is assigned for a period of several days to motormen on various lines out of each station so that he has experience with different platform instructors and on all types of cars in use. The platform instructors turn in daily reports, grading the student on sixteen points in four groups as follows:

Operation—Starts, stops, traffic rules, judgment of distance.

Safety—Following vehicles, passing vehicles, warning signals, carefulness, attention, emergency.

Service—Stopping for passengers, civility.

Responsibility—Conduct, following instructions, neatness, schedules.

These reports go to the supervisor of training and the grades are recorded on a permanent record. In all about seventeen to nineteen days is thus consumed, during which time the student has practiced on all lines operating out of the station. The student is then sent to the chief instructor for final examination; if he passes he is "turned in." Instead of going on the extra list, he is assigned to operate alone on one of the student runs with a regular conductor. The regular motorman takes some other open run for these days. The student works seven days on each line, the full assignment requiring in all about two months time. Thus much practice immediately follows the training. During this period the line supervisors make frequent observations, and the written reports made after each observation are subsequently filled in on the motorman's permanent record. Assistant instructors also watch the new men frequently and report to the chief instructor. After this extensive training, lasting from two to three months, the new motorman takes his turn on the extra list.

Selection of Other Employees

Bus operators, shop apprentices, clerical employees and stenographers are now selected by appropriate tests, and after well-planned interviews. Applicants for positions as bus operators must subject themselves to a road test first, as the present requirements are that they must know how to drive a gear-shift car. This road test, then, is in a sense a trade test. Upon passing this, the prospect is examined by appropriate mental tests. Last year, 27 per cent of applicants who applied failed to pass the psychological examination.

The other classes of employees are given appropriate tests to bring out indications of their fitness. One of the diagrams shows the situation that existed in the stenographic department. There were three grades of employees having appropriate salary ranges. It was found by test that the old employees did not fit accurately into this grouping. In fact, the employees showing the highest test were in the lowest paid group. This condition has been rectified in the new employees hired since this method of selection was introduced.

Cleaner Cars at Less Cost by Spray Washing

IN ELEVEN operating stations the Cleveland Railway now cleans its cars by the spray method. The car is run on the cleaning track and given a shower bath by sprays that wet the car thoroughly from the roof down to the lowest side of the side panels.

After the loose dirt is flushed off and the balance is thoroughly soaked the car is run ahead about a car length to the washing rack, with troughs on either side. The car cleaning gang with brushes then gives the car a thorough scouring on the outside. No time is wasted with pails and water as the brushes are dropped in the trough for rinsing and replenishing with clean water. At the same time part of the car cleaning gang is working on the inside of the car, washing windows, cleaning seats, ceilings and sides of the car and also the floor.

The cars are then run under the rinsing rack, after which they are run into the yard or carhouse and allowed to air dry.

By this process the cost of cleaning cars has practically been cut in two, decreasing from $1.80 on the old basis to 90 cents with the spray cleaning method. The cleaning is done by gangs of seven or eight people and the cars can be cleaned at a rate averaging six cars per man per day. Not all this saving is allowed to revert to the company, however, since cars are now washed every four days, whereas they used to be washed every ten days. So, for about the same cost, the cars are kept much cleaner.

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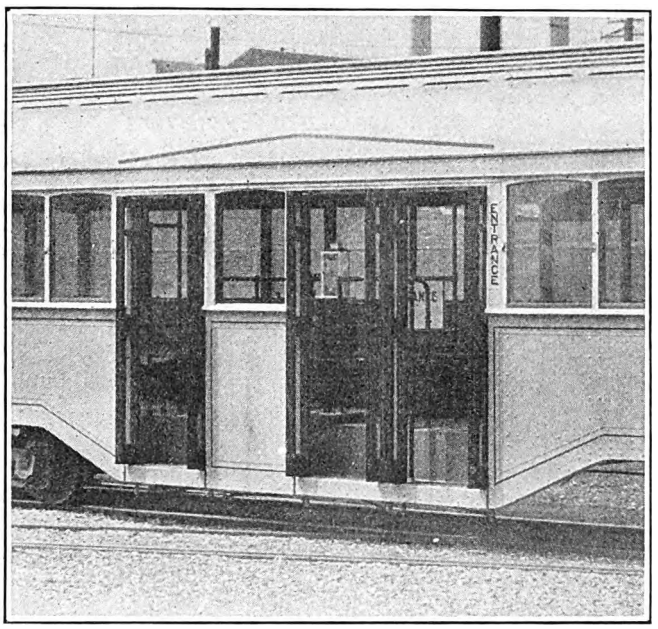
Additional Doors Speed Trailer Operation

TRAILER operation, much used in Cleveland, Ohio, by the Cleveland Railway, has never resulted in balanced loads between motors and trailer, the preference being to ride in the motor car. In an attempt to overcome this tendency on the part of the passengers, several trail cars have been constructed with a single door just to the rear of the center-entrance double door, the idea being borrowed from Toronto. Normally the double door is used for entrance and the single door



A Third Door in Cleveland Railway Trailers Separates Incoming and Outgoing Streams, Facilitating Passenger Interchange

for exit, the conductor standing between and collecting fares on the Peter Witt pay-as-you-pass system. At busy unloading points all three doors are used for discharging passengers.

This tends to increase the use of the trailers, as a crowd waiting to board is more quickly absorbed from the street, as there is absence of confusion resulting from two opposing streams of traffic so close together. In the motor car this is not experienced, as the passengers board the front end through the door controlled by the motorman and alight through the center doors.

Modernization Activities Described in Recent Publication of Georgia Company

OUTSTANDING among the various extensions of service made by the Georgia Railway & Power Company during 1925 were the purchase of 60 new street cars of modern type, including 40 one-man safety cars, and the purchase of fifteen double-deck gas-electric buses. Two bus lines were established in newly developed residential sections, where no transportation had previously been supplied. The buses are operated by the Atlanta Coach Company, controlled by the Georgia Railway & Power Company through ownership of the stock.

These points were made in a beautifully apportioned booklet recently published by the Georgia company to portray the manifold activities of its own organization and its subsidiary companies. The major portions of the Georgia company's service deals with the production and distribution of electric power, so that naturally a greater emphasis was placed upon this work in preparing the booklet. However, the street railway is by no means neglected. Several interesting pictures and considerable text are included to describe the transportation facilities provided in Atlanta, where the Georgia company's railway and bus lines are located.

Discussing the general franchises of the company, the point was made that all street railway franchises now held are without time limit, except those for approximately 20 miles of track, which are limited to 50 years from 1899. The electric light, power and gas franchises are without time limit.

Many pictures of the power developments on the Tallulah and Tugalo Rivers are included, as are also photographs of five plants on various other rivers. The six developments on the Tallulah and Tugalo Rivers will have a total installed capacity of 284,500 hp., while the five additional plants will add 28,500 hp. to the grand total. The company operates under 999-year lease the properties of the Georgia Railway & Electric Company and Atlanta Gas Light Company, which own and control the electric light and power, gas, street railway and steam heat business in the city of Atlanta and vicinity. Under the terms of the lease, the lessee pays the fixed charges, dividends on the stock of the lessor and maintains the properties.

Texas Safety Contest Reduces Accident Cost

TO INSTILL in employees a continuous desire to co-operate in the prevention of accidents the Texas Electric Railway has organized its trainmen into safety teams and distributes suitable prizes to stimulate interest. It has been found that by organizing trainmen into teams a relationship between co-workers is crystallized and responsibility is placed on each member to keep his record clean, not for himself alone but for the sake of his team.

Teams were organized in the latter part of 1918. The trainmen were divided into teams of ten men to each team on the interurban and Waco City lines, with a proportionate number of men to the team on each of the short local lines. Under the operation of this system each team is charged with the cost of every accident in which any man on the team is involved, and a penalty of $25 is charged against the cost of the accident for each unreported accident in which a member is involved.

Average per cent of gross revenue 1918 to 1923	4.08
For the year 1924 of gross revenue	3.15
For ten months of 1925 of gross revenue	3.54

Prizes are awarded every six months and range from $200 on the interurban divisions down to $75 on the city lines. The distribution is based on the cost of accidents of each team. The team having the minimum accident cost receives the first prize and the second minimum cost team receives approximately one-half as much. In addition to the team prizes, each individual member going through a half year without an accident, regardless of the standing of his team, receives a prize of $7.50.

Since the inauguration of this safety program the percentage of revenue absorbed by claims, including the prizes, is as shown in the table above.

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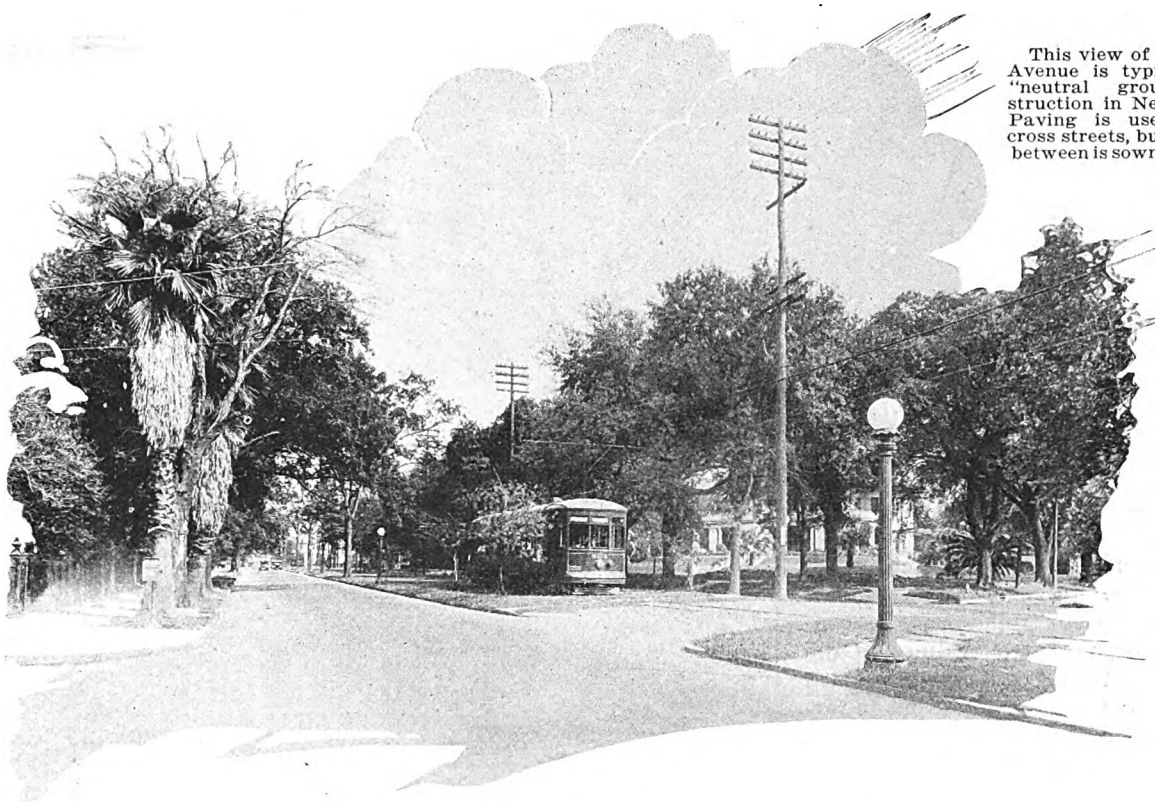

This view of St. Charles Avenue is typical of the "neutral ground" construction in New Orleans. Paving is used for the cross streets, but the space between is sown with grass.

Transportation Practice in New Orleans

Extensive Use for Car Tracks in Reservations in the Center of the Street Is a Feature of Electric Railroading in New Orleans—Methods of Keeping Cars on Schedule and Training Platform Employees Are Discussed in This Article

PROBABLY no other city in the country equals New Orleans in the number of miles of electric railway track which is laid in reservations in the center of the street, or "neutral ground" as it is generally called in Southern cities. Other electric railways in the South, like Mobile, Memphis and Pensacola, have a considerable amount of this construction, but of the 221 miles of track composing the system of New Orleans Public Service, Inc., more than one-third, 90 miles to be exact, is on neutral ground.

In most cases, especially in the older part of the city, these sections of neutral ground were originally canals, built for drainage purposes. Now most of them have been roofed over and the space above has been filled in, making extremely wide parkways. They form ideal locations for electric railway lines as no vehicle traffic is allowed on them except cross traffic at street intersections. The streets with neutral ground in the center are so broad that there is a wide roadway for one-way vehicular traffic on each side. The neutral ground is curbed on each side and generally is sown with grass. The widest of these streets with neutral ground is Canal Street, the principal retail business street in the city. Here the street is about 160 ft. wide and the neutral ground contains five tracks for a considerable distance. There is a difference in elevation of some 20 ft. between the portions of the city along the Mississippi River and Lake Ponchartrain and the central portion lying between. The grades are very slight, however, being only sufficient to provide for drainage. This condition and the existence of the many streets with neutral ground are favorable to good local transportation.

The chief impediment to operation in the past has been that some of the tracks in the city, during the period of competition between the old companies, were laid with a 5-ft. 2½-in. gage and some with a 4-ft. 8½-in. gage. Under the present management this condition is being corrected. The wider gage was chosen, as by far the larger part of the system used this gage. At present only about 40 miles of track remains with 4-ft. 8½-in. gage and this will be changed to the wide gage at an early date.

The average schedule speed of the cars is 9½ m.p.h. This, it will be recognized, is fairly high for a purely city system, because New Orleans has no "suburbs," as that word is understood in most cities, and the company has no interurban extensions. Its longest line outside the built-up section is to Spanish Fort, a distance of 7 miles, and that line is operated only in the summer. In the congested district the speed of the cars is slightly more than 5 m.p.h.

In ordinary daily service about 430 cars are required. Most of these are 47 ft. 8 in. long and are equipped with two motors each. Altogether the company has 372 cars of this type. It also has 101 single-truck cars and 42 trailers, these latter being used on some lines in the rush hours only. Plans are under consideration for the purchase of considerable new rolling stock. The company has no one-man cars.

Bus equipment consists of six Macks, nine Yellows,

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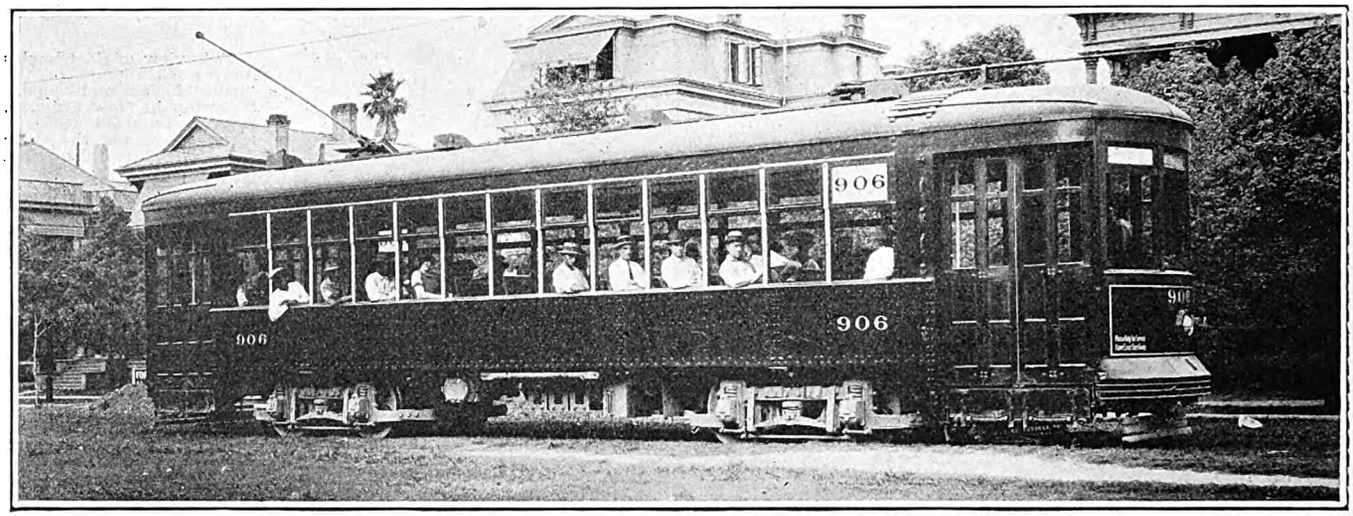


one Graham Brothers and three Fageol gas-electrics. In general the bus lines are extensions to trolley lines or connect one or more trolley lines in the outskirts of the city. There is one bus line parallel to trolley lines, but in territory not directly served by them. All buses have one-man operation.

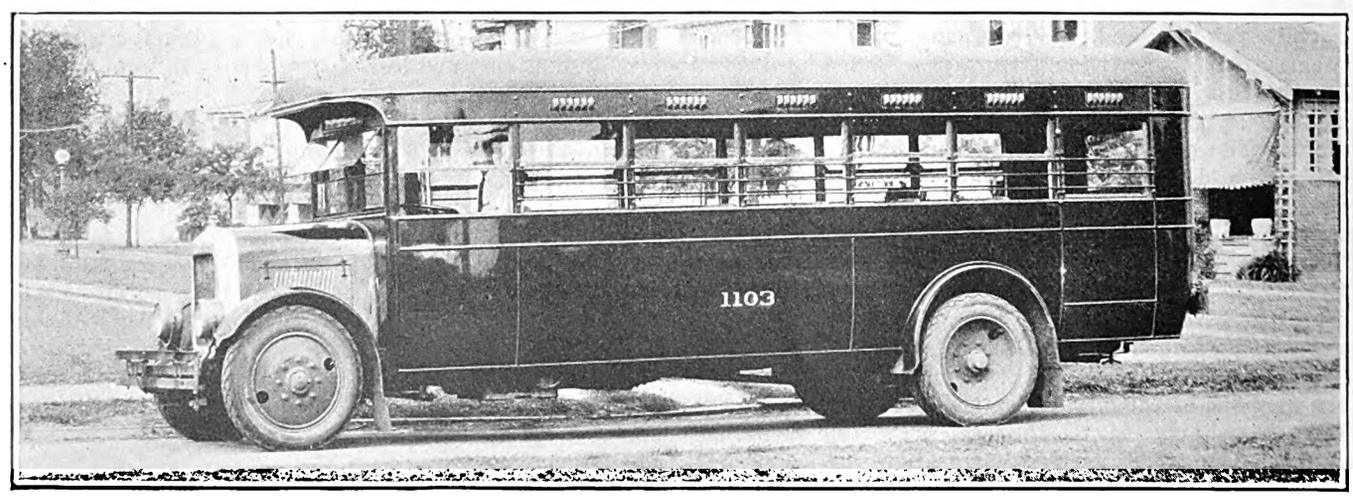
The fare on both bus and trolley is 7 cents with free transfers. For the convenience of the public the company will sell fare tokens for the single fare of 7 cents, but does not do so on the cars. The reason for this is that, at times, the conductors would be too busy to sell them and the public would not understand why tokens could be purchased on the cars at certain hours and not at others. The company, however, realizes the saving of time in car

Transportation in New Orleans

The view at the top shows the latest type of electric cars in New Orleans, the "900" series. The "800" series is quite similar.

At the right is a typical view of Canal Street, the principal retail business thoroughfare in New Orleans. In the view shown the reservation, or "neutral ground," in the center contains four tracks, but in some parts there are five tracks. The highways on each side are wide enough for a row of parked automobiles and space for at least three rows of moving cars.

The lower view shows one of the company's buses, used in crosstown service.



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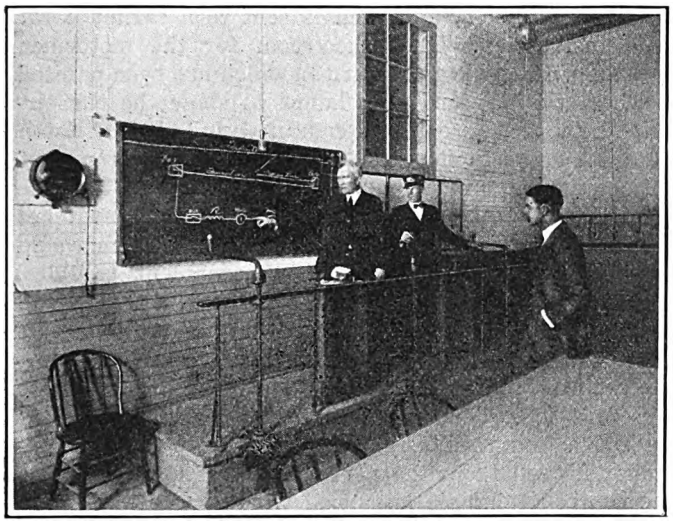
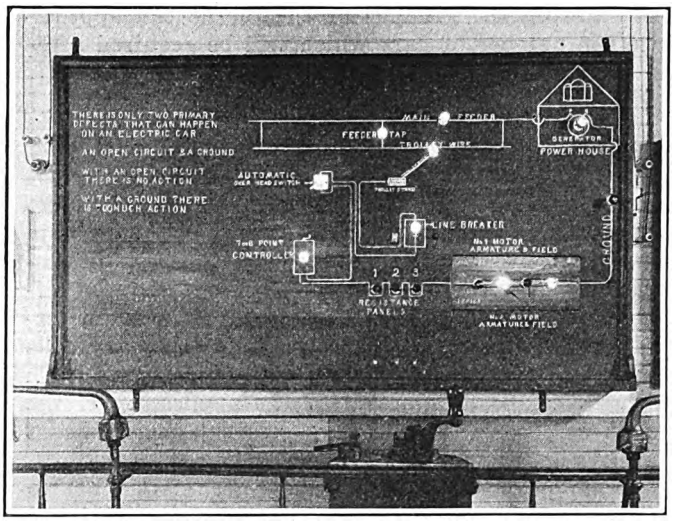


The Principles of Motor Operation Were Explained to the Student by Means of This Blackboard



This Schematic Diagram Is Now Used to Teach the Student Motormen How to Bring in a Disabled Car

loading when passengers in considerable numbers use tokens. In consequence, during the afternoon rush hours, the company has extra conductors on the street at seven downtown terminal points to sell tokens, give any required information and in other ways to speed up the service. These men, who are chosen for their appearance and sales ability, are on duty from 4:30 to 6:30 p.m. In addition the company sells tokens at its main office and also at its downtown information bureau. About 5,500 tokens are taken in during an average afternoon rush-hour period.

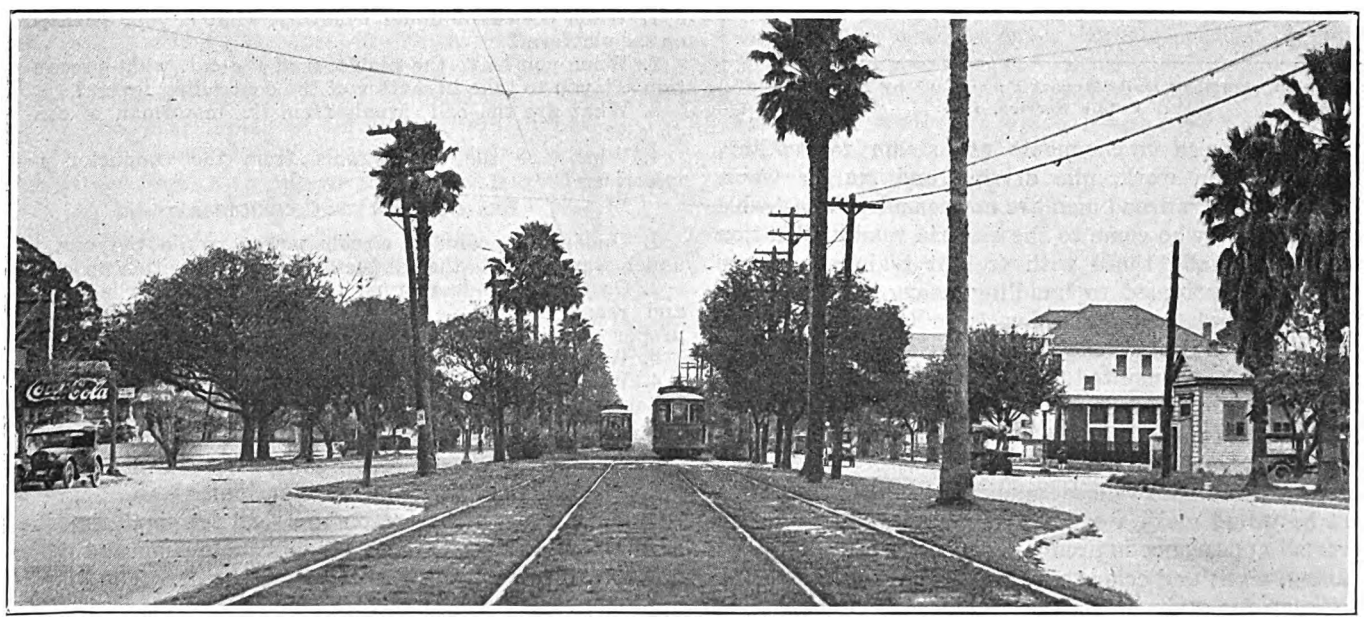
The information booth mentioned is on Canal Street, near the center of the principal retail business district, and is in a small building erected on the neutral ground. Here patrons can get information as to the routes to take them to any destination in the city. The booth is also the headquarters of an emergency man to care for car delays in the commercial district.

Caring for Schedule Delays

Great care is taken on the New Orleans lines to keep cars to schedule and care for traffic delays. One reason for this is that a considerable number of the streets over which the cars run are not paved except for the space between the tracks and for 18 in. outside of the rails. This portion of the paving the company is still obligated by law to construct and maintain. During dry weather all parts of these unpaved streets can be used by vehicles, but after heavy rains the paved portion along the track is apt to be used by all the vehicles because of the bad condition of the rest of the street. Then if a truck breaks down or becomes mired in the unpaved section of the street near enough to the track to foul a car a blockade is caused.

To combat this condition the company has a very efficient emergency service system with both emergency trucks and car wreckers. To supplement them, it stores towing ropes at different points on the system. These cables are of seven-strand galvanized wire with a link at one end and a hook at the other. By their aid an electric car often can pull a stalled truck out of the mud or off the track.

Every important car line has its own supervisor who is on duty uptown in the morning and downtown in the afternoon to see to the regular movement of cars. A supervisor is also always stationed near the entrance to the grounds when any important outing or other occasional event is held. By counting the number of per-



On Esplanade Avenue Near Galvez Street, Showing Span Construction. On Some Other Neutral Ground Center Poles Are Used

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sons entering the grounds or theater he can approximate the number of cars which will be required after the event is over.

Recruiting Platform Men

Each successful applicant for employment must be at least 5 ft. 4 in. tall, weigh at least 130 lb. and be not more than 35 years of age. To be considered, he must furnish four references of people who have known him from one to five years, as well as the names of his employers for the previous five years. If one of these references is not satisfactory the applicant is not necessarily rejected. A representative of the company calls on the person writing the unsatisfactory letter to learn the basis of his disapproval of the applicant. If the disapproval seems to be largely personal, the applicant is asked to supply two more references.

Certain prior employments have been found not to give very satisfactory recruits for the electric railway

Form 117 2-25-4m

NEW ORLEANS PUBLIC SERVICE INC.

DAILY REPORT OF ROAD INSTRUCTOR.

Date_____192__

LINE TRAIN No. CAR No.

Conductor REGULAR Conductor PROBATIONARY Conductor STUDENT

Motorman Motorman Motorman Badge No.

Dry Double Truck On_____M.

TRACK TYPE CAR TIME

Slippery Single Truck Off M. No. Trips

NAME OF PLATFORM INSTRUCTOR Badge No.

CONDUCTORS	AVERAGE	MOTORMAN	AVERAGE
Appearance		Appearance	
Collecting and Registering Fares		Controller	
Bell Signals		Air Brake	
Receiving and Discharging Passengers		Hand Brake	
Issuing Transfers		Doors	
Trip Sheet and Reports		Sand	
Deportment		Power Saving	
TOTAL		Crossings and Curves	
		Deportment	
		TOTAL	

REMARKS_____

RECOMMEND_____

Rate_____ Name_____ Date Appointed_____

Action Taken_____

RATE CODE
100% Excellent
75% Good
50% Fair
25% Poor

Road Instructor's Daily Report Form Used by New Orleans Public Service, Inc.

business. These employments are steam railroading, structural iron work, pile driving and marine work. Former steam railroad men are not considered desirable because those who come to the electric road application office are usually those with freight train experience only and accustomed to handling heavy equipment in rather a rough manner. Men from the other trades mentioned, it is also thought, are so used to heavy work as to make them unsuited to the more careful manipulation required of electric cars. Recruits most perferred are the young men from the country districts surrounding New Orleans.

Every candidate whose application blank indicates that he would make a satisfactory employee and whose personal appearance is promising receives a preliminary hearing, sight and color test before being passed to the physician for a physical examination. If accepted thus far he is taught the fundamentals of platform operation at the schoolroom, and then is sent to a carhouse for road instruction. The schoolroom for the motormen is fitted with an electric board on which has been painted a schematic diagram with lamps to show the car circuits. The school room also contains a full-sized skeleton car with complete electrical equipment. The circuits of this equipment are provided with switches at the side of the car, so that by turning one or more switches the instructor can bring about the effects which would be caused by the more common equipment troubles. Thus one switch will ground No. 1 motor, a second will open the controller circuit, a third will open the circuit of the resistors, a fourth will open the circuit of one of the motors, and so on.

Before a student motorman is allowed to qualify for service he must be able, when standing at the controller, to tell from the performance of the motors as the controller handle is turned which switch has been moved and what the defect is in the motor circuit. He must also be able to say what course he has to follow, with a defect of that kind, to bring his car to the carhouse. That, in fact, is the purpose of the instruction, i.e., not to make equipment experts of the men, but to teach them enough to prevent cars with slight troubles from blocking the line. Further particulars of the methods used by New Orleans Public Service, Inc., in instructing employees will be found in an article in the issue of this paper for Aug. 2, 1924. The only important change made since that time is the substitution of the board with miniature lamps to show the car circuits, mentioned above, for a blackboard with circuits designated by white lines. The present arrangement simplifies the instruction, as the circuits can be cut out in proper sequence by switches.

The instruction given to conductors relates to the duties to passengers, methods of collecting and registering fares, making change, signaling the motorman, etc.

After a preliminary instruction of fifteen days or so, depending on the aptitude of the man, he returns to the chief instructor for a preliminary examination, mostly oral. If this is satisfactory he returns to the carhouse for a period of about 30 days. He then has to pass a written examination of some 80 questions. Typical questions follow:

Examination for Motormen

1. When the car is under headway, what is your position on the platform?
2. When you leave the platform of the car, what precaution are you to take in matter of the controlling levers?
3. What are the bell signals from the motorman to conductor?
4. What are the bell signals from the conductor to motorman?

Examination for Conductors

1. Under all ordinary circumstances, while the car is under way, what is the conductor's proper position on car?
2. On the "open-door" type of car, when traffic is heavy and rear platform is crowded, what is the conductor's proper position on platform?
3. Why is it necessary for you to assume this position?
4. What are the bell signals from the conductor to the motorman?

As these 80 questions really cover all of his duties, the candidate is given a copy of them to study some days before he has to pass the examination.

During his trial period on the road frequent reports of the performance of each student motorman and conductor are received by the chief instructor. The blank used for this purpose by the road instructor is reproduced.

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London Bus Service Reduced to Relieve Congestion and Protect Tramways

Decrease Ordered by Ministry of Transport in Number of Daily Bus Trips—Further Restrictions Contemplated — Protests Made by Independent Operators — Co-ordination Under a Single Management Considered as a Possible Solution of the Problem

Both Trams and Buses Contribute to the Congestion at Aldgate

FOLLOWING prolonged study of the traffic and transportation situation in London, the Ministry of Transport has ordered drastic cuts in the daily number of bus trips on one of the great thoroughfares serving the western suburbs. This action is intended to be the forerunner of similar orders applicable to other important routes. The object is twofold; to lessen street congestion and to protect the tramways from ruinous bus competition.

Congestion of street traffic in London is an old problem, having first attracted public attention more than 40 years ago. In fact, congestion in the central area was one reason why no tramway lines were built there when electric railways first came into vogue. Successive British governments appointed royal commissions to study the traffic problem but no action ever was taken.

The advent of the motor vehicle made matters far worse than ever they were. General motor traffic increased rapidly, and motor buses soon became much more numerous than the horse buses which they superseded. In England generally local authorities have a certain amount of control over buses through the issue of licenses to which conditions can be attached. In London, however, the Metropolitan Police is the licensing body, and it has no power to refuse licenses so long as the vehicles conform to requirements as to size and general structural design. Neither can the police fix the routes on which buses shall run. Thus in recent years hundreds of new buses have come upon the streets, all at liberty to run when and where they please, except on a few streets where all buses are forbidden.

An accurate idea of the rapidity of this growth is given by the number of bus licenses in force during each of the last five years. The Home Secretary is authority for the following figures: 1921, 3,473; 1922, 3,732; 1923, 5,117; 1924, 5,384; 1925, 5,478.

Ministry of Transport Created and Advisory Committee Appointed

Soon after the World War the jealousies and antagonisms among the numerous local authorities of the London metropolitan area were sufficiently ironed out to permit the creation of a Ministry of Transport with broad powers of regulation over tramways and highway

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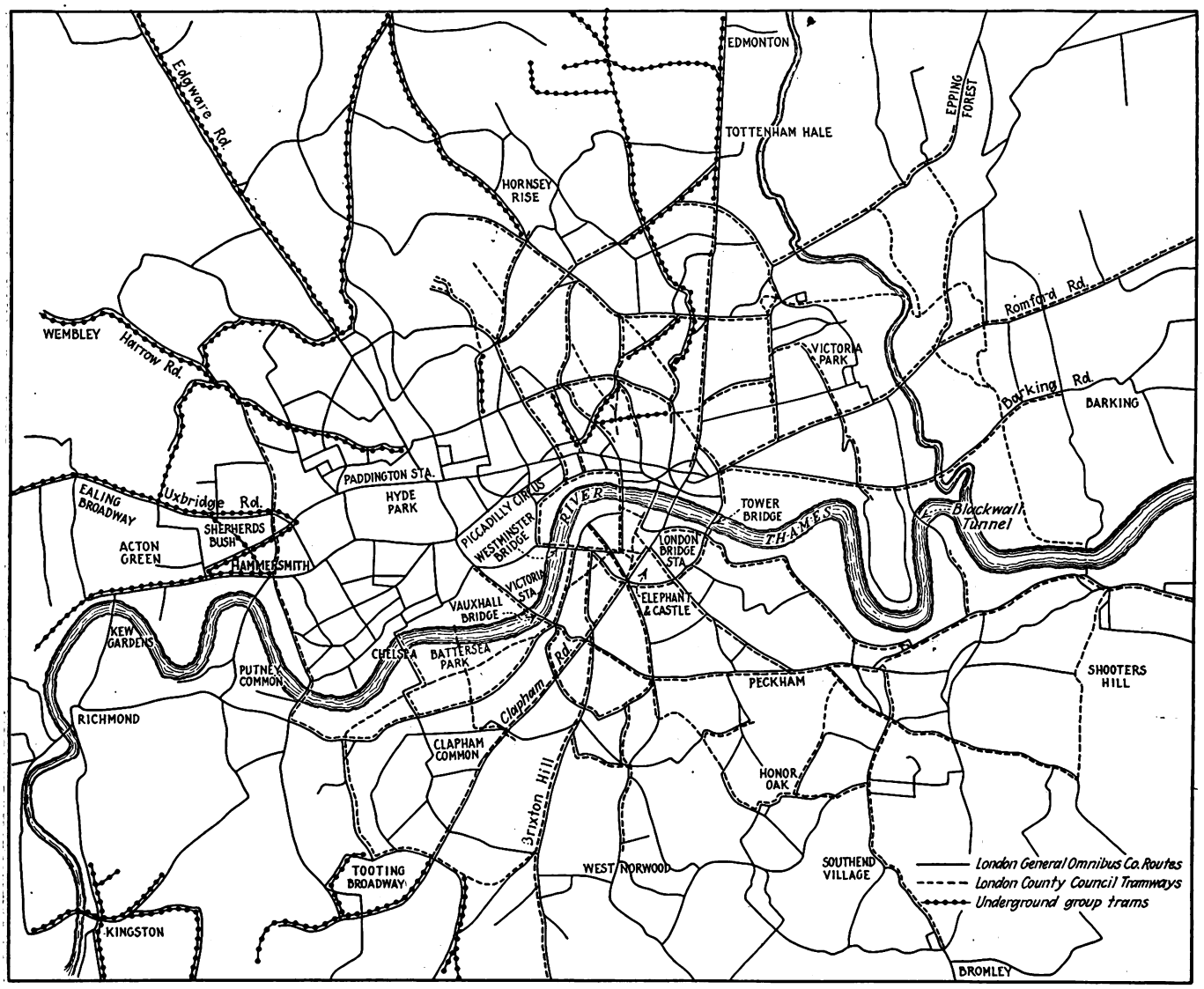
traffic. This ministry has certain authority over the issue of bus licenses in the country but not in London. However, this lack was made up in 1924 by the passage of the "London traffic act." This law authorized the formation of a London and Home Counties Advisory Committee whose function is to give advice and assistance to the Minister of Transport in relation to traffic in the metropolitan district. Members of the committee are appointed in specified numbers by the local authorities, by the police, by a secretary of state, and by the Minister of Transport.

Power has been given to the advisory committee to attach conditions to bus licenses as to routes and schedules. Moreover, the Minister of Transport, with the approval of this committee, may restrict or prohibit the operation of buses on certain streets, or may stipulate to the various bus operators how many trips each one shall make.



Extensive Duplication of Routes of Tramways and Buses in London as Shown Here Is a Source of Serious Traffic Congestion and Economic Waste

Position Stabilized

Owing to the delays of local authorities it took a long while to secure the appointment of the members of the advisory committee. Soon after being fully constituted, however, the committee showed that it intended to do something. In the spring of 1925 the Minister of Transport issued, in accordance with a recommendation of the committee, a list of important streets on which no additional buses would be allowed, as facilities already in existence were thought to be considerably in excess of actual needs. A second such order was issued in midsummer. Included on the two lists were all the principal streets in the metropolitan area, some having tramways and others without tramways. The position was thus stabilized.

According to the London General Omnibus Company, the average number of buses now operated by it in the London traffic area (inside 25-mile circle) is 3,914, and within the Metropolitan Police District (inside 15-mile circle) is 3,792. About 500 independents also are operating in the latter area.

Ownership of buses according to the latest available information is as follows:

102 proprietors with 1 bus each
43 proprietors with 2 buses each
11 proprietors with 3 buses each
4 proprietors with 4 buses each
9 proprietors with 5 buses each
7 proprietors with 6 buses each
4 proprietors with 7 buses each
2 proprietors with 8 buses each
2 proprietors with 9 buses each
5 proprietors with 10-20 buses each
2 proprietors with 21-30 buses each
1 proprietor with 31-40 buses
1 London General Omnibus Company with 4,628 buses

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Consideration was next given to reducing the number of bus trips on streets where more service was being given than really was needed. Tramway streets were considered first. In the report of the advisory committee the urgency of protecting the tramways against intensive bus competition was emphasized. It was pointed out that the situation was serious, as with the exception of Ilford Urban District Tramways (municipal) none of the tramways in the London district was profitable. The committee stated that the tramway service was an essential part of the passenger transport system of London, especially for the working classes. It was pointed out that during the early morning hours the tramways are used to their utmost capacity in carrying passengers at the cheap and unprofitable workmen's fares imposed on them by statute, while few or no buses are on the streets. Heavy charges borne by the tramways for road maintenance also were considered and the committee came to the unanimous conclusion that an immediate check to the competition was essential if the tramway services were not to become bankrupt.

Traffic Congestion on Ludgate Hill, London, Is Typical of Conditions on Many Routes

First Reduction in Number of Trips

On Feb. 24, 1926, announcement was made by the Minister of Transport that on March 29 a reduction would be made in the bus service on Uxbridge Road between Shepherd's Bush and Uxbridge. Intensive competition between buses and cars of the London United Tramways exists on this route and much unnecessary service is operated.

The independent bus owners are objecting strenuously to the restrictions, while the London General Omnibus Company, as part of the London Underground "combine," is interested in suburban tramways, and is acquiescent. The present plan is to reduce the L. G. O. trips and the independent trips in the ratio of two to one. Four petitions, aggregating 900,000 signatures, have been presented to the House of Commons in protest against this measure.

It has been announced by the advisory committee that regulations will be issued for other tramway routes where wasteful competition exists and where service can be reduced without detriment to the public. It is probable that the regulations will involve ultimately the removal of several hundred buses from the routes over which they now operate. Unless the proprietors can find other routes on which they can profitably operate them without creating wasteful and uneconomic competition with existing passenger transport facilities or causing unnecessary congestion in the streets it will be necessary for these vehicles to be removed altogether from service in the Metropolitan Police district. Such a result must necessarily impose some financial loss on the proprietors affected, and there is no power under the London traffic act or otherwise whereby any compensation could be paid or obtained in respect to such loss, either in respect to capital invested or otherwise. In these circumstances the Minister has suggested that proprietors as a body might voluntarily set up a fund to which all would contribute, and from which financial assistance could be afforded to those proprietors who may sustain loss. Sympathy for the losers is mitigated by the fact that many of them entered the business with full knowledge that restrictions were pending.

According to Sir Henry Maybury, director general of roads in the Ministry of Transport and also chairman of the advisory committee, the actual increase in omnibus facilities has been even greater than the figures indicate, as in pre-war years the average seating capacity per vehicle was 34, whereas today it is 50. The bus has been employed to a large extent in direct competition with other forms of transport, in a way that has been financially detrimental to the rapid transit lines and almost disastrous to the tramways. More serious still has been its effect in arresting development in railway and tube construction, much needed now on account of the increasing tendency to live further from the center.

Perhaps partly due to depression in trade, but mainly owing to the increasing competition by buses, the municipal London County Council Tramways—the largest

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tramway undertaking in the metropolitan area and formerly a prosperous one—has shown an increasing deficit during the last few years. The financial year ends on March 31, and the last accounts available at present are those for the twelve months ended March 31, 1925. Figures are given by years in the accompanying table.

FINANCIAL RESULTS—LONDON COUNTY COUNCIL TRAMWAYS

	1922–1923	1923–1924	1924–1925
Operating revenue	£4,895,605	£4,374,057	£4,229,837
Operating expenses	3,660,577	3,518,362	3,754,140
Gross income	£1,235,028	£855,695	£457,697
Amortization	£712,134	£736,997	£483,885
Net income	£230,250	*£160,222	*£278,441
Receipts per car-mile	18.13d	16.04d	14.63d
Expenses per car-mile	13.83d	13.17d	13.24d

*Deficit.

Other municipal tramway undertakings in the metropolitan area outside the county of London, of which there are four or five of comparatively small dimensions, have suffered heavy losses through bus competition. Apparently, a slight recovery is taking place now as their weekly traffic returns show an improvement on the figures for the preceding year.

There are three tramway undertakings in the outskirts of London operated by private companies, namely, the Metropolitan Electric Tramways (north of London), the London United Tramways (west of London), and the South Metropolitan Tramways (south of London). They, too, have been hard hit by the intense bus competition.

Little or no information concerning the financial status of the independent bus owners is available. Some are individuals, some are small firms, a few are companies on a limited scale, so far as London is concerned, but having traction interests in other parts of the country. Nor does it appear possible to arrive at exact figures to show the financial position of the London General Omnibus Company. Under an act of Parliament passed some ten years ago a common fund was established for the various underground electric railway companies and the London General Omnibus Company, by which all profits made by each company are paid into a common pool. Out of this pool each company is paid a certain proportion. The accounts of the bus company for last year, "after the operation of the common fund," show traffic receipts of £8,644,035, an increase of £245,470 over the previous year. What the actual receipts were is thus not revealed. A dividend of 6 per cent, tax free, was declared after setting aside £300,000 in reserve, £50,000 more than in the previous year.

Expenses per bus-mile can be determined with reasonable accuracy, as the common fund arrangement does not apply to them. Total expenditures were £8,248,473, an increase of £195,158. Bus-miles operated were 143,943,201, an increase of 6,892,666, making the cost per bus-mile about 13.8d. This figure is somewhat higher than the operating cost per car-mile of the London County Council tramways, as given above. Speeds are approximately the same.

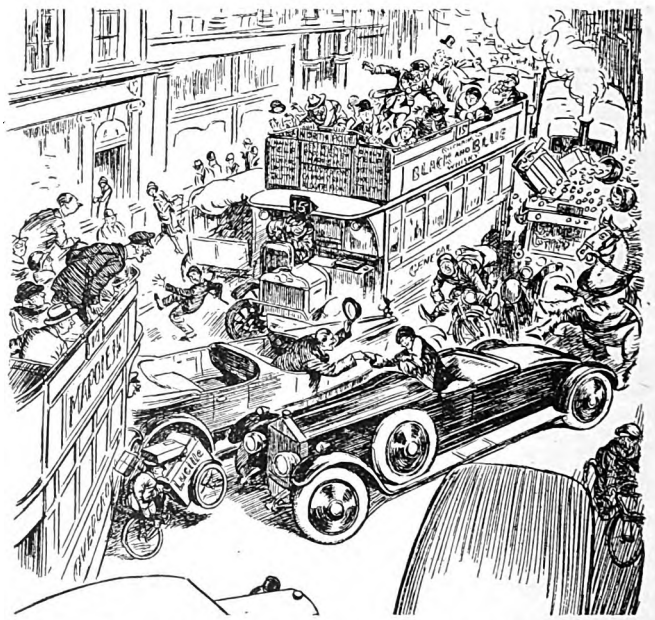
Passengers carried by each form of public transportation service in the year ended December, 1924, were as follows:

Omnibuses	1,485,000,000
Suburban railways	474,000,000
Underground railways	369,000,000
Tramways	983,000,000
Total	3,311,000,000

Passengers carried by buses in 1913 numbered 736,000,000 and in 1925 numbered 1,600,000,000. This increase has been secured largely at the expense of the tramway and rapid transit undertakings. Such growth of traffic on the surface of the streets is thought by the advisory committee to be undesirable and extremely costly to the community. Wholesale widening and enlargement of the streets to accommodate the traffic would be impracticable on account of the enormous cost.

Co-ordination Suggested

Curtailment of bus service is not expected in itself to solve the traffic problem. In the opinion of Lord Ashfield, chairman of the board of the Underground companies, the establishment of the London transportation agencies on a stable and satisfactory basis demands a broad plan embracing both a common financial



Confusion in the Streets of London as Seen by "Puck"

interest and a common management. The year 1925 saw limits set to the growth of competition of vehicles for passengers in the streets, but the existing competition still remains with its elements of danger and disorder. Lord Ashfield states that his companies are prepared to enter into negotiations with other transport undertakings to see whether it is possible to devise machinery to permit the common management of all. Under these circumstances guarantees would be given to the public that the service provided would be adequate, convenient and cheap, and also guarantees to the shareholders that the common management would aim at securing a reasonable return upon the capital employed. With the knowledge gained from the operation of the common fund he believes that the right principle upon which a common management could be built up and could function is the establishment of a common fund or pool of the balances of receipts of the several undertakings after meeting their respective obligations in full. Out of this common fund or pool any deficiencies would be met so that all undertakings were maintained solvent, and finally, out of this pool would come the return upon the ordinary capital and the appropriations to reserve. Such a pool would destroy at one stroke all sectional and particular interests, and release the energies of officers and staffs to follow a common purpose.

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The Readers' Forum

Further Comment on Annual Maintenance Number

PITTSBURGH RAILWAYS COMPANY

PITTSBURGH, PA., April 1, 1926.

To the Editor:

I have examined the Annual Maintenance Number of the ELECTRIC RAILWAY JOURNAL with a good deal of interest and with a feeling of pleasure that the importance of the maintenance man in helping to sell rides is recognized.

As a matter of fact, any success in selling transportation must be based on the quality of service. Any inferiority in the quality of service is bound to reduce the amount sold and will result in an unfavorable attitude on the part of the public.

The quality of service, of course, is primarily based on the condition of track, cars and overhead. Poor maintenance will vitiate the best efforts of organizations selling transportation service. It is highly important that your JOURNAL stress the need for high standards of maintenance, and I am glad to see you have given it a very prominent place in your publication, culminating each year in the Annual Maintenance Number.

A. W. THOMPSON,
President.

CITY OF DETROIT
Department of Street Railways

April 3, 1926.

To the Editor:

I have read with great interest your Annual Maintenance Number of the ELECTRIC RAILWAY JOURNAL, March 20, 1926, and I am particularly pleased with the editorials on old cars, co-ordination of car and bus maintenance, the elimination of car noises, and the question of building new equipment in car shops, as this is the line upon which we are proceeding in Detroit.

I believe that the articles in your issue and the editorial comments made regarding these matters, if carefully studied by the railway managers, will very materially help the entire industry.

I wish to compliment you on the entire set-up of this issue.

H. U. WALLACE,
General Manager.

Interstate Loop as Part of Transportation Plan for Metropolitan District

REGIONAL PLAN OF NEW YORK AND ITS ENVIRONS

NEW YORK, March 22, 1926.

To the Editor:

The discussion in your columns on the interstate loop proposed by the North Jersey Transit Commission has been valuable as a means of clarifying a very difficult problem. It seems obvious that something must be done to improve the present method of transporting railroad passengers between New Jersey and New York City. The present arrangement is unsatisfactory, not only for most of the commuters but also for the long-distance passengers on those lines without through rail service to Manhattan.

Considering both present and ultimate requirements, the best facilities will be those which form part of the most flexible system. They can then be made to meet both present and future demands. The interstate loop as planned, if also made a part of the system for distributing Westchester and Long Island railroad passengers, could be used both as part of a system of east-west and north-south lines and for belt-line operation. As part of a comprehensive scheme trains could be routed in any way that future traffic may require.

The first step in the construction of this loop as proposed by the North Jersey Commission is almost identical with routes also shown in the Westchester County Transit Commission's report, the suburban transit plan prepared by D. L. Turner in 1924 and the regional transportation proposals presented by Col. William J. Wilgus in his paper before the International City and Regional Planning Conference held in New York City last year. This is in itself a very strong argument for the immediate execution of this part of the plan.

I believe that ferries and rapid transit service such as furnished by the existing Hudson & Manhattan lines, and extensions to them or New York City subway systems, will always carry a large part of the New Jersey passengers, mostly the short-haul traffic. This should make it possible eventually to use the proposed loop for through routing of railroad trains as planned by the commission. It is probable that as this region increases in size there will be, between Manhattan and Hudson County and Newark, N. J., a heavy traffic throughout the day somewhat comparable to that on the Manhattan rapid transit lines. This should tend to cause a leveling down of the very extreme concentration which now exists during the morning and afternoon rush hours.

HAROLD M. LEWIS,
Executive Engineer.

Detailed Cost Data Are Important

LOS ANGELES RAILWAY

LOS ANGELES, CAL., March 6, 1926.

To the Editor:

Accurate cost accounting enables the manufacturer to determine the relative amount of money he is making or losing on each of the different kinds of articles or products he manufactures. If he is making money on a particular kind of article, he may be able to lower his price on it and thus increase his sales and his business grows accordingly. If he is losing money on a particular kind of article or product, it is obvious that he must decrease his cost of manufacture or distribution, change its design, increase his advertising, increase its price, or stop manufacturing it. If he does not do one or more of these things, he continues to lose money and the production of that particular product continues to be a liability rather than an asset.

He would not be able to distinguish between the money-making products and the money-losing products if it were not for his cost accounting system, and he therefore considers it of the utmost importance to the success of his business. The railway operating company is a manufacturer in the true sense of the word. It manufactures a product in daily use and in constant demand—that product is transportation.

Suppose a railway operator begins to loose money on one group of products which may be represented by the car-miles operated over one particular line. It would certainly behoove him to know the fact and to get busy and change the conditions until he turned the line into a money maker rather than a money loser. There are

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instances where it may be necessary to maintain service on a line, even though it is impossible to make it pay, in order to hold franchise rights pending future development or for political or other reasons. However, it is certainly desirable to know how much it costs to operate such a line so that the losses may be reduced to a minimum. Again such information might be used to advantage through publicity channels.

The kinds of products that an operator manufactures are relatively small in number as compared to the total quantity manufactured. For example: the average car of a system operates more than 30,000 miles per year at a total operating cost varying between 20 and 35 cents per car-mile, depending chiefly upon the type of equipment used (including power, track, line, and rolling equipment) and the service. If this operating cost could be reduced 1 cent per car-mile through an improvement in the general efficiency of the system, it would mean a net saving of $300 per year per car. Such a saving is certainly not hard to conceive of when actual service tests have many times proved that the difference in maintenance cost alone on two types of motors operating over the same line under cars of the same weight was greater than 1 cent per car-mile. This is rather startling when it is realized that the total car maintenance, including motors, trucks, body, brakes and control equipment, is less than 10 per cent of the total cost of operating a car-mile.

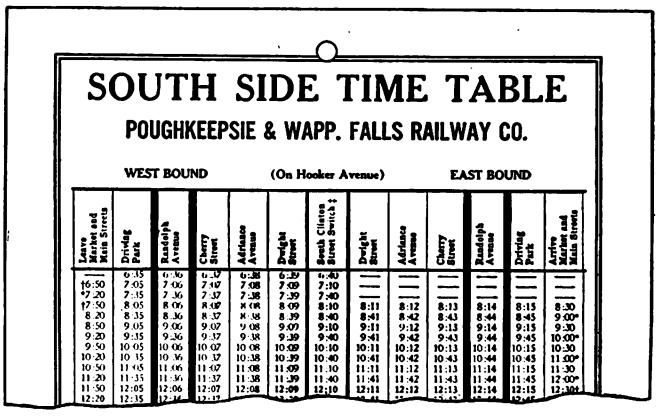
Every operator recognizes that equipment suited for one line does not necessarily mean that the same equipment is suited for all lines of his system. He usually bases his conclusions upon only one or two large considerations such as certain equipment will or will not be suited to the present schedule speed of the line he is considering, or it will or will not have a suitable capacity to handle the traffic demand. It is safe to say there are many important angles of an application that he does not consider because he has no segregation of costs at hand by which he may measure their relative importance. His true aim is to reach a balanced condition that will permit him satisfactorily to supply the demand at the least cost of manufacture. The more nearly he can approach this balanced condition, the more nearly he may operate his system on a sound and profitable basis.

Without segregated costs, any conclusions an operator arrives at before making a change in equipment, or in operating conditions, are necessarily based upon approximations and assumptions. With such costs his conclusions would be based upon definite facts in which he would have confidence. The cost of maintaining a group of clerks to keep this detail cost segregation would be extremely small in relation to the other operating expenses. The facts that these costs would reveal would certainly enable the management to make changes and adjustments to the operating conditions that would effect savings sufficient to many times pay the expense of keeping them. This is especially obvious when it is realized that at least 80 per cent of the cost of keeping such a system is already made necessary by the demands of the governing bodies on the operators for periodical statements and reports.

Analyses made from detail cost data are just as important to the railway operator as they are to the manufacturer. Until they develop cost accounting and learn to use it intelligently, they will continue to waste much effort and money and their progress will not keep abreast of that of other industries. H. E. JORDAN,
Assistant Engineer.

Railway Time-Tables Distributed by Trainmen

WITH a view to establishing a personal contact between the Poughkeepsie & Wappingers Falls Railway and its prospective customers, schedule cards recently have been distributed by operators in uniform. The south side district of the city, which has been building up rapidly during the last year or two, was selected for this experiment. This district is residential in character and contains the homes of many people who own their own automobiles and have been using them in the past when making trips downtown. Realizing that the general public is interested chiefly in the time when cars pass a given point in the immediate vicinity of their residences, G. W. Comfort, general manager of the railway, conceived the idea of making these time points especially prominent on the cars by blocking them out as shown in an accompanying illustration. For instance, if a person resides in the vicinity of Randolph Avenue, he receives a card so ruled that the times of



SOUTH SIDE TIME TABLE

POUGHKEEPSIE & WAPP. FALLS RAILWAY CO.

WEST BOUND (On Hooker Avenue) EAST BOUND

Leave Market and Main Streets	Driving Park	Randolph Avenue	Cherry Street	Adriance Avenue	Dwight Street	South Clinton Street Switch	Dwight Street	Adriance Avenue	Cherry Street	Randolph Avenue	Driving Park	Arrive Market and Main Streets
	6:35	6:36	6:37	6:38	6:39	6:40						
16:50	7:05	7:06	7:07	7:08	7:09	7:10						
17:20	7:35	7:36	7:37	7:38	7:39	7:40						
17:50	8:05	8:06	8:07	8:08	8:09	8:10	8:11	8:12	8:13	8:14	8:15	8:30
8:20	8:35	8:36	8:37	8:38	8:39	8:40	8:41	8:42	8:43	8:44	8:45	9:00*
8:50	9:05	9:06	9:07	9:08	9:09	9:10	9:11	9:12	9:13	9:14	9:15	9:30
9:20	9:35	9:36	9:37	9:38	9:39	9:40	9:41	9:42	9:43	9:44	9:45	10:00*
9:50	10:05	10:06	10:07	10:08	10:09	10:10	10:11	10:12	10:13	10:14	10:15	10:30
10:20	10:35	10:36	10:37	10:38	10:39	10:40	10:41	10:42	10:43	10:44	10:45	11:00*
10:50	11:05	11:06	11:07	11:08	11:09	11:10	11:11	11:12	11:13	11:14	11:15	11:30
11:20	11:35	11:36	11:37	11:38	11:39	11:40	11:41	11:42	11:43	11:44	11:45	12:00*
11:50	12:05	12:06	12:07	12:08	12:09	12:10	12:11	12:12	12:13	12:14	12:15	12:30*
12:20	12:35	12:36	12:37									

Schedule Cards Distributed by Poughkeepsie Trainmen to South Side Residents Show Arriving and Leaving Times of All Cars at Various Street Corners

all cars passing this street are clearly shown. The operators selected for the distribution of the time-tables were among the most capable in the employ of the company. They were not only familiar with the district, but enjoyed the personal acquaintance of many of the residents. Instructions were to spend as much time as was required to explain the service and also to answer any questions that might be put to them. On the reverse side of the card is a message reading:

"We want your business. It has been our endeavor to sell more transportation. We believe it is to your interest to buy more. There are many advantages in street car riding that we hope will appeal to you.

"Every man and woman who goes to a market seeks the best merchandise at the lowest price. The same is true of almost every article. Certainly it is true of transportation. The best because the most dependable, the safest, the surest and measuring up to the other test—the most economical.

"Improvement of service depends upon patronage. We would like you to understand that the more you ride the more frequently will you find cars on hand to carry you.

"Ride the street cars and be relieved of parking worries, assure yourself of getting there and back safely, and bear in mind that you will save money by using this mode of transportation."

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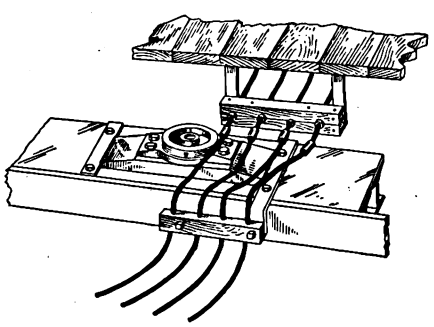
Maintenance Notes

Spreader on Bolster Saves Motor Leads

REDUCTION in the amount of play allowed motor leads is accomplished on cars operated from Roseville carhouse of the Public Service Railway, Newark, N. J., by means of a spreader mounted on the truck



Placing Cleats for Motor Leads Near Center of Truck Reduced Rubbing and Maintenance Troubles

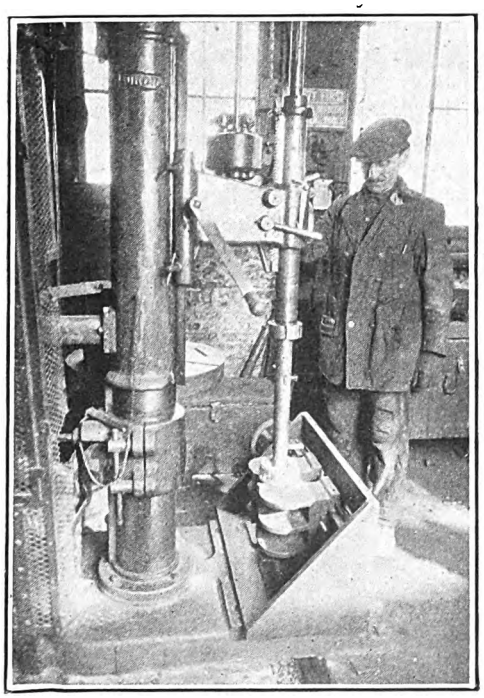
bolster. The motor leads are held taut by cleats mounted on an L frame. This frame is attached as near as possible to the center of the truck bolster, almost immediately below the cleats for the motor leads on the car-body frame. The spreader was designed by Ben Singleton, shop foreman, on the theory that the closer together the sets of cleats were placed the less would be the play and the less the chance of grounding one of the leads on the iron framework of the truck. Slight differences in the design of trucks required minor modifications in the method of holding the spreaders. A typical method is shown in an accompanying illustration. Since the installation of these devices on the cars at Roseville, trouble with motor leads has been greatly reduced.

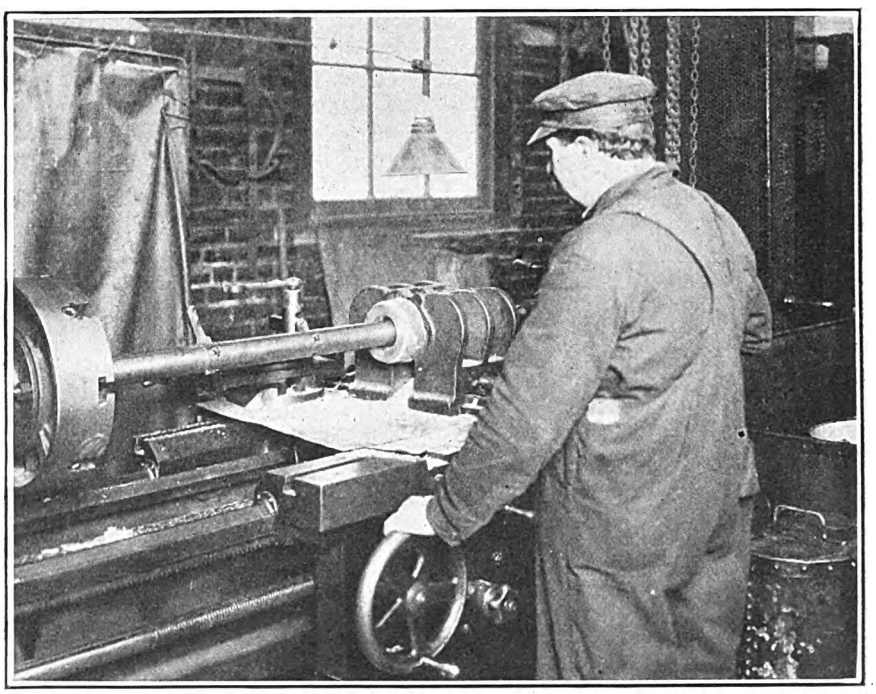
Self-Centering Vise Insures Accurate Work

PRACTICE of the Brooklyn-Manhattan Transit Corporation is to fit each armature bearing to the particular shaft with which it is to operate. When armatures are changed at the various inspection shops or when new bearings are put in, it is necessary for the boring to be done. As these shops are used only for inspection and light repairs, few machine tools are included in the shop equipment. It is therefore of advantage to have an attachment so that accurate boring of the bearings can be done either on a drill press or lathe. The accompanying illustrations show a special vise attachment which has been designed particularly for this work.

In the illustration which shows the boring of an armature bearing as carried out on a drill press, the self-centering vise is supported by an angle-shaped casting. This casting is bolted to the bed of the drill press. The two jaws which clamp the bearing, slide horizontally on ways which are secured to the base casting. A screw with hand wheel outside the end of the casting operates the jaws, which are threaded and work back and forth on the screws. The faces for holding the bearings are V shaped, and movement is provided so that they can open wide enough to take the largest bearing used on the system. A boring bar is used in the press for the boring operation.

The V-shaped jaws of this vise insure that when boring a bearing it is centered accurately with the machined outside portion. Also, the simple manner with which the jaws are opened and closed makes the operation one which can be made easily and done quickly.





At Left, Boring an Armature Bearing Held in V-Shaped Vise Attached to a Drill Press. At Right, Method of Boring Armature Bearings in a Lathe by Having the V-Shaped Vise Attached to the Lathe Carriage

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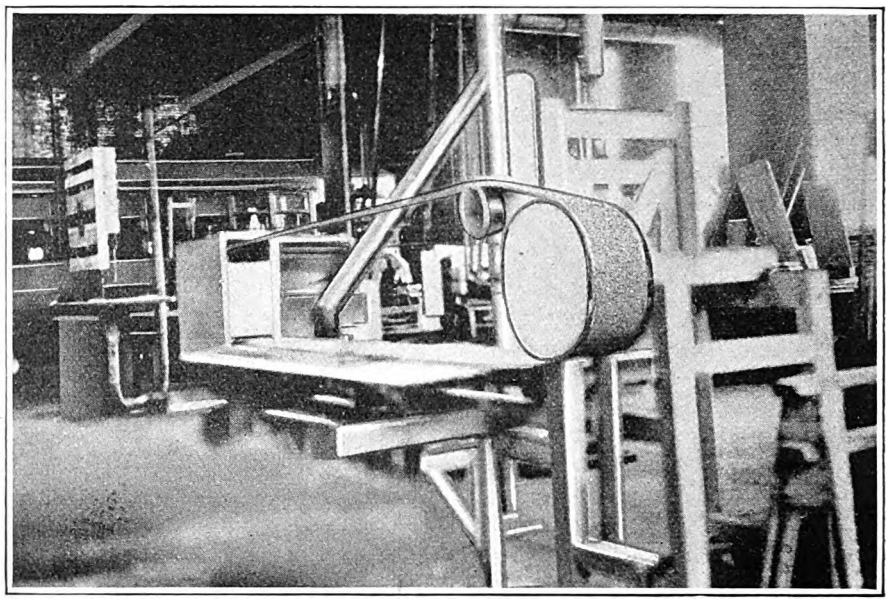
A second illustration shows the V-shaped vise as applied to the carriage of a lathe for performing the same operation. The construction of the vise is quite similar, but of course the angle-shaped casting used with the drill press is unnecessary as the vise can be bolted directly to the carriage of the lathe. The boring bar then fits between the head and tailstock in the lathe.

Another advantage in using this vise fixture is that it can be left attached to the drill press or lathe and it does not interfere with other operations. Thus, in the drill press the usual table will swing around over the top of the vise and in the lathe, the vise is mounted at the back of the carriage so as not to interfere with the tool post supports.



A Power-Driven Sand-Surface Belt Makes Light Work of Wood Finishing in the Shop of the Community Traction Company, Toledo

New Uses for Old Rails

NUMEROUS uses for scrap rail have been discovered by the Augusta-Aiken Railway & Electric Corporation. As a rule, old rail is hard to get rid of, because even the scrap dealers are not particularly anxious for it. The applications made in Augusta of old rail may not have taken care of very much of it, but even any use is so much to the good.

One accompanying illustration shows a barrier, made of old rail, erected in front of the gasoline pump at the main carhouse and shop in Augusta, Ga. The service trucks and automobiles of the company can now back up to this pump for their supply of gas without danger of going back too far and knocking down the pump. The vertical members of this barrier are old rail, set in concrete, and the horizontal member, which is also of an old rail, is welded to them.

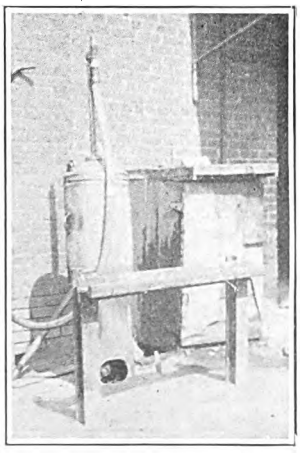
A more extensive use of old rail by the Augusta-Aiken Railway & Electric Corporation is in the construction of waiting shelters for passengers along the interurban line of the company between Augusta and Aiken. In these shelters the two principal vertical supports are old rails which are set in concrete to a depth of from 24 to 30 in. The two end horizontal supports for the roof are 2-in. angles the ends of which are supported, as shown, by bar brackets. On the inner sides of each vertical rail supports is a 2-in. x 4-in. wooden stud to which the wooden crosspieces of the roof and seat backs are attached. These studs are bolted to the base of the rails adjoining them. The wooden seats are supported by bar brackets.

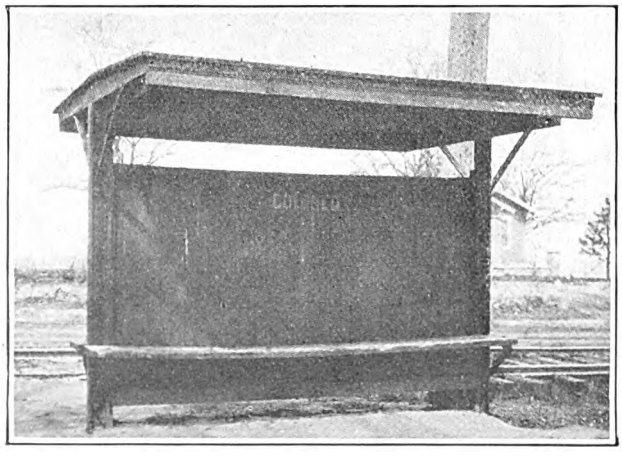
One side of this station is used by white passengers and the other side by colored passengers.

The company has also used old rails for the vertical supports of warning "Stop, Look, Listen" signs.

Sandpapering Made Easy in Toledo

FINISHING of wood surfaces by sandpapering is greatly speeded up by the use of the power-driven sandpapering device used by the Community Traction Company, Toledo, Ohio. As shown in the accompanying view, a cloth-back sandpaper belt about 6 in. in width is driven by means of a small motor or from line shafting, the driving pulley being inclosed in the housing on the left-hand side of the device. The large pulley at the right holds the sandpaper belt a predetermined distance from the sanding board, which is a movable platform just below the lower portion of the belt. The small idler wheel at the right maintains a predetermined tension in the sandpaper belt. The material to be sanded is first placed face upward underneath the belt against the stop formed by the wheel housing on the





At Left, This Guard for the Gasoline Pump in Augusta Is Made of Old Rail. In Center and at Right, Waiting Shelter, the Vertical Supports of Which Are Also Discarded Rail

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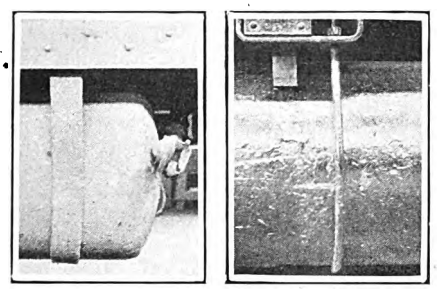
left-hand side of the machine. The sandpaper belt is then pressed against the material to be finished by means of wood blocks equipped with suitable handles for holding them.

Round Supports Eliminate Corrosion

DIRT and moisture accumulating underneath the flat iron supporting bands of air reservoirs on cars of the Department of Street Railways, Detroit, Mich., caused considerable corrosion. In order to eliminate this the railway is now replacing all the wide flat bands with

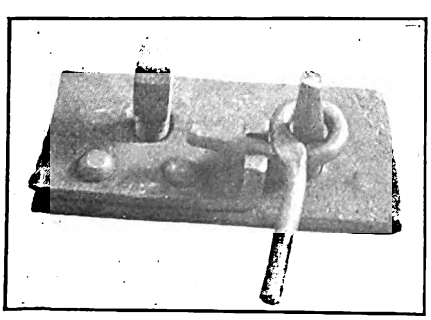


At Left, Wide Iron Bands Previously Used to Support Air Reservoirs in Cars. At Right, New Type Round Steel Support Now Used

⅝-in. round steel supports. These leave little space for dirt and moisture to collect and have done away with the trouble. The ends of the round steel rods are threaded to receive a standard nut for fastening to the car body support. An accompanying illustration shows the old and new types of construction.

Fixture for Forming Loop at End of Rod

MANY of the rods used in connection with the underbody equipment of electric cars have eyes or loops at their ends. A convenient fixture for forming these is shown in the accompanying illustration. It is used in the shops of the Eighth Avenue Railroad, New York City. In using this fixture the portion of the rod which is to have the loop is heated in a forge and is then placed between two projecting lugs on the fixture. The remaining portion of the rod can then be wrapped around another projecting portion so as to form the eye. At the point where the two sections cross, the rod is welded in the usual manner by striking it a few sharp blows.

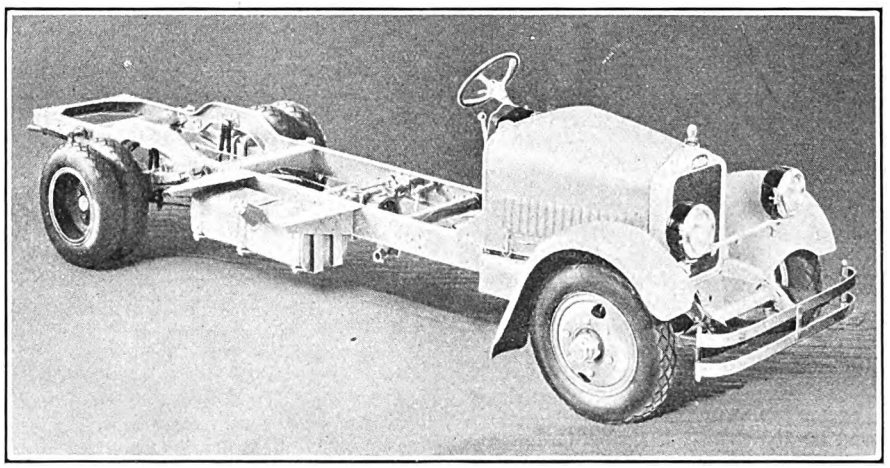


Device Used to Hold and Form Loop at End of Rod

New Equipment Available

Light-Weight Bus Chassis

SOME of the advantages claimed for the new Model 53 bus manufactured by the White Company, Cleveland, Ohio, are frame rigidity and ruggedness, short turning radius, powerful and easy braking, engine flexibility and economy. A new chassis was brought out in answer to the demand for a vehicle of smaller capacity than the standard size White bus but like it in road performance, comfort and general riding qualities. The chassis is supplied with a 180-in. wheelbase to which can be fitted bodies with baggage compartments and seating fourteen to sixteen passengers for intercity service, or bodies without baggage compartments seating 21 passengers in city service.



White Model 53 Bus Introduces Several New Features

Novel features which have been embodied in this model are a new type of front axle giving extra wide wheel spacing, and an improved steering gear permitting easy handling with balloon tires and short turning radius. The instrument board gives an extraordinarily compact arrangement of controls within easy reach of the driver.

Several features of the power plant are of particular interest. Among these are the lubrication system, which provides for an adequate continuous supply of clean oil under pressure to all crankshafts, camshafts and connecting rod bearings through the use of a unique arrangement by which the return oil must go through a settling chamber before passing through a screen of large area into the reservoir. A release valve automatically limits the pressure irrespective of weather conditions and variations in the viscosity of oil. Connecting rod bearings are of the direct babbitted type. Three-part suspension of the engine is used to relieve the aluminum crankcase of undue strain.

A selective type four-speed transmission provides a range of gear ratio carefully chosen for ease of operation. A spherical rubber support in the dash bracket, a special spring retention of the steering case assembly and an improved method of attachment to the knuckles are claimed to improve the steering qualities. The front springs are semi-elliptic while the rear springs are of the progressive type, the bottom three leaves coming into action only under heavy loads or when the road conditions are bad. The type of spring shackles used permit of adjustment for side wear, and it is claimed that side sway is eliminated under all loading.

Several major specifications follow:

Wheelbase	180 in.
Gage	Front 62 in., rear 67½ in.
Length over all	272 in.
Width over all	86 in.
Tires	low-pressure balloon 34 in.x7½ in. Single front and dual rear.
To center line of rear axle	139 in.
To end of frame	209 in.
Springs:	
Front	40½ in. long, 2½ in. wide, semi-elliptic type.
Rear	60 in. long, 3 in. wide, progressive type.

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American Association News

Convention Committees Appointed

PRESIDENT F. R. COATES of the American Electric Railway Association has announced the appointment of the special committee personnel, that will have charge of details in connection with the 45th annual convention and exhibit to be held in Cleveland, Ohio, Oct. 4 to 8, inclusive.

The hotel committee will have control of the allocation of all rooms assigned for the convention. All requests for rooms will be cleared through this committee in order that the distribution may be made as fairly as possible. The functions of the exhibit and entertainment committees are the same as in former years.

CLEVELAND HOTEL COMMITTEE

Paul E. Wilson, secretary the Cleveland Railway, Cleveland, Ohio, chairman.
Frank Campbell, Cleveland, Ohio.
William J. Hanley, Cincinnati, Ohio.
E. J. Lang, Cleveland, Ohio.
L. G. Parker, Cleveland, Ohio.
James H. Walker, Cleveland, Ohio.

EXHIBIT COMMITTEE

Col. J. H. Alexander, vice-president the Cleveland Railway, Cleveland, Ohio, chairman.
C. P. Billings, Pittsburgh, Pa.
C. H. Clark, Cleveland, Ohio.
S. J. Cotsworth, Philadelphia, Pa.
W. J. Flickinger, New Haven, Conn.
H. Fort Flowers, Findlay, Ohio.
Charles Gordon, New York, N. Y.
B. A. Hegeman, Jr., New York, N. Y.
Richard R. Holden, Chicago, Ill.
G. L. Kippenberger, St. Louis, Mo.
J. R. McFarlin, Philadelphia, Pa.
J. C. McQuiston, East Pittsburgh, Pa.
C. E. Morgan, Brooklyn, N. Y.
A. F. Paul, Philadelphia, Pa.
A. L. Price, Mansfield, Ohio.
A. M. Robinson, Philadelphia, Pa.
L. W. Shugg, Schenectady, N. Y.

ENTERTAINMENT COMMITTEE

S. J. Cotsworth, sales agent Lorain Steel Company, Philadelphia, Pa., chairman.
Col. J. H. Alexander, Cleveland, Ohio, vice-chairman.
L. J. De Lamarter, Grand Rapids, Mich., vice-chairman.
C. H. Beck, New York, N. Y.
A. C. Blinn, Akron, Ohio.
H. L. Brown, Mansfield, Ohio.
John Chandler, Cleveland, Ohio.
F. A. Elmquist, New York, N. Y.
T. A. Ferneding, Dayton, Ohio.
L. E. Gould, Chicago, Ill.
A. A. Hale, New York, N. Y.
R. A. Hauer, New York, N. Y.
H. J. Kenfield, Chicago, Ill.
T. O. Kennedy, Cleveland, Ohio.
C. S. McCalla, Akron, Ohio.
C. M. McCreery, Philadelphia, Pa.
J. A. Ritchie, Chicago, Ill.
George Stanton, Cleveland, Ohio.
J. B. Stewart, Jr., Cincinnati, Ohio.
J. V. Sullivan, Chicago, Ill.
E. P. Waller, Schenectady, N. Y.
F. H. Wilson, Cleveland, Ohio.

New York Transit Problem Discussed by Metropolitan Section

CONDITIONS in their own home town was the subject to which the members of the Metropolitan Section devoted their attention on April 2. Lucius S. Storrs, managing director American Electric Railway Association, gave an extremely interesting outline of the development of transportation facilities in New York City and suggested methods of improving the present situation. An abstract of Mr. Storrs' paper appears elsewhere in this issue. Walter Jackson, consultant, Mount Vernon, N. Y., added a few comments concerning the present tramway and bus situation in London. He pointed out that the buses have an advantage over the cars there in that they furnish an unbroken ride between the outlying sections and the older part of the city, whereas the tramway lines terminate some distance away from the business section. Mr. Jackson spoke also of the trend away from the use of double-deck vehicles. This is especially the case on the continent of Europe, he said, and exists also to some extent in England.

An inspirational talk on the subject "Life as a Great Adventure" was given by Dr. Samuel W. Grafflin, religious work director of the Young Men's Christian Association. The trainmen's trio of the Long Island Railroad rendered a number of pleasing musical selections.

More members of the Metropolitan Section were present at this meeting than at any previous meeting during the present season, the attendance being 221. Before the meeting a Dutch treat dinner at Keene's English Chop House was attended by more than 70 members of the section. It was announced by the secretary that the membership had increased to 1,195. The next meeting will be held on May 7 and will be managed by the representatives of the manufacturers.

Development of Transit in New York City*

Past History Briefly Reviewed—Street Car Operation Unnecessarily Delayed by Obstructions on Tracks—Substitution of Buses for Cars Will Not Solve Problem

BY LUCIUS S. STORRS
Managing Director American Electric Railway Association

NOWHERE in the world today is there a greater transportation problem than in New York City. This is the largest city in the United States, but because of failure to keep abreast of the need for improved and increased transportation facilities its growth and development are being hampered.

Facilities that were adequate a quarter of a century back are not adequate today nor are facilities that were adequate ten years ago, or five years ago. There must be routes that reach into every part of the city, the most modern types of vehicles, regardless of the power which propels them, and modern-minded men behind the transportation systems.

Transportation development in New York has been slow. Ninety-four years ago, shortly after the beginning of steam railroad transportation in this country, horse-drawn omnibuses running on iron rails were started on Fourth Avenue, between Prince and Fourteenth Streets. It took more than twenty years, however, to get the horse-car lines really started. By 1864 the lines had increased to twelve. Some horse cars remained in operation continuously in New York until 1917, when the last one in the lower part of the city disappeared.

The first elevated railway, operated by steam, began service in 1868, following a bitter franchise fight in the State Legislature. Several of the bills which caused controversy in Albany contemplated the building of a subway, and it is a striking commentary on the slowness with which transportation problems have been met in the city that approximately 50 years elapsed before the first subway was built.

The first trial trip of the elevated was made on April 3, 1868, the car running from the Battery. The original elevated cars were run with cables, but the cable system soon was abandoned and steam engines substituted. The elevated lines continued to operate under steam power until 1900. The Brooklyn elevated system was constructed in the early 80's and steam engines were used there until the system was electrified along with the Manhattan elevated line.

More than 50 years ago, when living costs were much lower than they are today, and wages considerably less, transportation fares were much higher

*Abstract of a paper presented at a meeting of the Metropolitan Section A.E.R.A., New York, N. Y., April 2, 1926.

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than they are today. A resolution presented in connection with fares in the early 70's proposed these rates: From the Battery to 59th Street, 10 cents; from the Battery to Harlem, 15 cents; from the Battery to Highbridge, 17 cents, and for 5 miles, 10 cents, and each additional mile, 2 cents.

Electric surface lines did not come into use in New York City until the early 90's, and they traveled a rocky road. The first car in the subway system was run on Oct. 27, 1904, from the City Hall to 145th Street and Broadway, being operated by Mayor McClellan.

An indication of how the riding habit has grown is shown by the fact that in 1860 the number of annual rides per capita were 43 and last year they were 449. Today the surface lines of New York are carrying 35 per cent of all car riders and the subways approximately 65 per cent. The number of persons carried by buses was small compared with the grand total.

There always has been a great deal of uninformed comment about New York City transportation. All too often it has been taken by the riders at its face value. As a result we have a public very badly misinformed on transportation matters.

There is no doubt about there being a place in our New York City transportation for buses, but it is ridiculous to suppose that the installation of buses is going to be a material factor in the solution of traffic congestion or the general transportation problem. Major relief can be accomplished only by the building of more rapid transit lines and straightening out the present traffic congestion, so surface car lines can function to the fullest extent.

Transportation in New York City is being unnecessarily delayed by multitudinous obstructions on street car tracks. If street cars were given a clear way over their rails, instead of being held up interminably by trucks, pleasure cars and other vehicles, transportation could be speeded up immeasurably. Not nearly all the available space on surface lines in New York City is being utilized by riders, and the principal reason is that they cannot be assured of the car moving at satisfactory speed when they board it. This is no fault of the car nor of the companies. It is the fault of improperly regulated traffic which blocks cars on every hand.

Electric car riders are entitled to uninterrupted rides between crossings on the tracks which car companies have provided. It has been demonstrated in Philadelphia and elsewhere that trucks and other traffic can be kept off street car tracks. Probably it would be more difficult in New York to do this than in some other cities, but certainly with the police and traction employees cooperating, cars could be speeded up greatly.

The answer to the local traffic situation in a nutshell is mutual co-operation of city and traction company officials in providing, first, for uninterrupted movement of cars, and, second, for better equipment.

Let no one be misled by the recent publicity regarding buses into believing that they are going to speed up traffic, relieve the present street congestion, or keep the fare down to 5 cents. Buses very positively are not going to do any of these things. What the bus can accomplish is to furnish an excellent supplemental service to the mass carriers, particularly on crosstown streets which are not able to support electric car service, and also provide a de luxe ride for those wishing to pay more than street car fare. Buses will add to rather than relieve traffic congestion. Experiments here and elsewhere have proved conclusively that the ratio of buses needed to transport equal numbers of passengers to street cars is about five to three. In other words, every time you take off three street cars, you will have to put on at least five buses.

London has tried unsuccessfully for many years to substitute buses for surface line cars. One section of the city has been given over exclusively to bus operation. The buses finally reached the point where they were carrying 40 per cent of all riders, and indescribable traffic congestion resulted. When the total number of buses reached 6,000, congestion became so intolerable that the government traffic authorities decided that it would be necessary to eliminate some of the vehicles in order to make the streets safe. The only other alternative was to widen streets at the expense of taxpayers.

It seems almost unnecessary to say anything about the 5-cent fare, but because there still are persons in New York who talk about running buses for a nickel the point should be covered. The failure of city buses, started under Mayor Hylan's administration, to succeed on 5 cents, is one answer to the argument. Another is the failure of any reputable bus concern to come forward and offer to establish a city-wide service on a flat 5-cent fare. It is hoped for the good of the city that bus franchises will be granted only to reputable concerns, with service the primary, and fares the secondary consideration.

People in New York are just like the people in almost any other community in this respect: They want reasonable car fares, but primarily they want good service.

The best service will come in New York from a thoroughly co-ordinated transportation system. In so far as possible, the bus franchises should be given to companies which will co-ordinate bus with car service. To grant bus franchises indiscriminately to a large number of individual owners of bus fleets would be to burden unnecessarily the riding public and to make a still greater mess of the local transportation situation.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 13-16—Southwestern Public Service Association, Galveston, Tex.

April 21—Central Electric Traffic Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 22—Central Electric Railway Accountants' Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 21-23 — American Welding Society, annual meeting, Engineering Societies Building, 29 West 39th Street, New York City.

April 23—Metropolitan Section, American Institute of Electrical Engineers, Engineering Societies Building, New York City, 8 p.m.

April 30—National Highway Traffic Association, annual meeting, Automobile Club of America, New York City.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26 — New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

August 12-13 — Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Highway Traffic Association to Hold Annual Meeting in New York

ON APRIL 30 the annual meeting of the National Highway Traffic Association will be held in the assembly room of the Automobile Club of America, New York, with an afternoon and an evening session. A number of addresses of interest to electric railway and bus operators are scheduled, including the following:

"The Trend of Motor Vehicle Legislation," by Russell H. Huffman, National Automobile Chamber of Commerce.

"Metropolitan Traffic Control," by Harold M. Lewis, Regional Plan of New York and Its Environs.

"Organizations for Traffic Planning in Municipalities," by Arthur H. Blanchard, University of Michigan.

"High Cost of Bottlenecks on Highways," by G. E. Hamlin, Connecticut State Highway Department.

"Highway Safety Promoted by Adequate Brakes on Motor Buses and Trucks," by David C. Fenner, International Motor Company.

There will also be reports from committees on traffic control signal systems at street intersections and on the regulation of pedestrian traffic.

David Beecroft, vice-president, will preside at the afternoon session and President Arthur H. Blanchard at the evening session.

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The News of the Industry

Further Progress on St. Louis Franchise Draft

Essentials of the new franchise for the United Railways, St. Louis, Mo., have been determined by the city administration. The new grant will provide for service at cost. The measure will prescribe that the cities shall determine the character of the service, paying a fare necessary to produce such service. The other controlling factors will be the rate of return the company shall receive and the valuation on which the return shall be earned. The valuation fixed by the Missouri Board of Public Service, approximately $57,500,000, has been adopted tentatively by the city. The state commission has held that the company is entitled to earn 7 per cent return on its valuation. Additions to capital account would include only such sums as were actually expended.

The present city fare of 7 cents is not sufficient to net a 7 per cent return on $57,500,000, unless there is a large increase in revenues or a substantial cut in operating expenses. The reorganization committee, however, has expressed the hope that it will be able to put into effect operating economies that will not only permit the fare to remain at 7 cents, but also to improve the service.

The 7 per cent return on the company's valuation has been tentatively agreed on, but it is probable that some method of modifying that will be worked out.

The bill will create the position of director of transportation or traffic. That official will have supervision of the company for the city. This presents the difficulty that under the city charter the occupant of this office must be a subordinate of the Director of Public Utilities, a post that pays $8,000. It appears probable on the other hand that as much as $15,000 a year must be paid to obtain a man sufficiently efficient properly to fill the position of director of transportation.

Mayor Miller and officials of the organization committee are also considering the creation of a Board of Control, composed of one representative of the company and appointment of a Director of Transportation representing the city, whose decisions would be subject to review by a board of arbitration.

The City—The Denver Tramway —The Law

The city of Denver, Colo., has asked the United States Supreme Court to review and rule on its suit against the Denver Tramway. It will be recalled that Federal Judge Robert E. Lewis adjudged that the company had a perpetual franchise, but he gave the receiver the right to increase the fare from the 5 cents specified in the franchise to 8 cents. That is the fare the company is charging.

In this connection it is believed the suit between the city of Loveland, Colo., and the Public Service Company of Colorado has some bearing. The city of Loveland condemned the electrical plant of the company, paid the appraisal price, erected a municipal plant and abolished the company's franchise three years before its expiration. On March 8 the Colorado Supreme Court sustained the ruling of the lower court to the effect that the city acted within its rights. It said that "the servant is not greater than the master. The engaging hope of a perpetual franchise is destined to disappointment."

The Public Service Company sought to show that its franchise was in perpetuity.

The city authorities of Denver hope that the high court will reverse the finding of Judge Lewis and that a new franchise will be placed before the voters for ratification.

Results Reported Under New Akron Grant

Only $46,813 Left for Depreciation and Return on Investment After First Year's Operation—With Only 30 per Cent More Rail Mileage 130 per Cent More Passengers Were Handled on Cars than on Buses

ONE full year has passed since the contract between the city of Akron, Ohio, and the Northern Ohio Traction & Light Company became effective. In consequence the company has submitted to the city, the patrons and the citizens in general a report of its stewardship. The company says further that "it desires to do this for the reason that the people of Akron are entitled to know just what has been done under the contract and what the facts are concerning the operation of the city railway and bus systems." This is the prelude. The most important single fact is that only $46,813 was available for depreciation and return on investment after the payment of expenses and taxes. The statement made is as follows:

Gross revenue — rail and bus lines	$2,460,633
Operating expenses	2,289,559
Balance	$171,073
Taxes	124,260
Amount available for depreciation and return on investment	$46,813
Miles of bus routes — Dec. 31, 1925	68.05
Miles of bus routes — Dec. 31, 1924	49.8
Increase	18.25
Bus miles operated 1925	3,243,762
Bus miles operated 1924	2,071,591
Increase	1,172,171
Revenue passengers per car-mile	6.51
Revenue passengers per bus-mile	3.66

Attention is directed to the large increases in miles of streets on which bus service is being provided and in bus miles operated in providing service in districts not heretofore enjoying transportation facilities.

The total number of revenue passengers carried on both street cars and buses during the year was 39,070,768; of this number the street cars carried 27,214,456; the buses 11,856,312. The total number of transfer passengers carried was 10,273,159, more than 25 per cent of the total revenue passengers. The street cars carried 7,165,401 of these transfer passengers, and the buses 3,107,758. The rates of fare in effect are 7 cents cash, seventeen tickets for $1, four tickets for 25 cents, with free transfers.

Attention is called to the fact that because of the large percentage of transfer passengers carried, the average rate of fare received by the company per passenger carried was 4.94 cents; leaving transfer passengers out of consideration, the average fare per revenue passenger was 6.24 cents.

To carry the 27,214,456 revenue and 7,165,401 transfer passengers, the street cars operated a total of 4,177,967

SOME OPERATING STATISTICS AT AKRON

Revenue from street cars and bus operation	$2,460,633
Car-miles operated	4,177,967
Bus-miles operated	3,243,762
Earnings per car-mile, cents	40.46
Earnings per bus-mile, cents	23.01
Revenue passengers carried—street cars	27,214,456
Revenue passengers carried—buses	11,856,312
Total revenue passengers carried	39,070,768
Transfer passengers carried—street cars	7,165,401
Transfer passengers carried—buses	3,107,758
Total transfer passengers carried	10,273,159
Total revenue and transfer passengers carried	49,343,927
Revenue per revenue passenger carried — street cars and, buses, cents	6.24
Average revenue per passenger carried, including revenue and transfer passengers, cents	4.94
Gallons of gasoline used	741,897
Average number revenue passengers carried per car-mile	6.51
Average number revenue passengers carried per bus-mile	3.66
Bus-miles per gallon of gasoline	4.37
Cost of gasoline used, including 2 cents per gallon tax, cents	15.32
Total cost of gasoline	$113,644.90
Cost of tires used	$62,890.72

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car-miles, while the buses operated 3,243,762 bus-miles and carried 11,856,312 revenue passengers and 3,107,758 transfer passengers. With only 30 per cent more railway mileage, approximately 130 per cent more passengers were carried on the street cars than on the buses.

On its part the company has thanked the city, its officials and patrons, for the co-operation given it during the year in its efforts to build a transportation system to meet the needs of Akron. It is the intention of the company to submit to the city from time to time a report showing the result of operation to the end that a better relationship and understanding may be established between the public and its transportation company.

As a result of the election in November, 1924, a new contract became operative on Nov. 12, 1924, between the company and the city for the transportation of passengers within the city limits for a period of four years.

$1,300,000 Needed for Rapid Transit Work at Cincinnati

Approximately $1,300,000 is needed to complete the rapid transit system at Cincinnati, Ohio, in accordance with the original plans. This statement was made by Col. E. O. Sherrill, City Manager, in a memorandum filed with the Rapid Transit Commission. The statement accompanied a report detailing the history of the transit system from the inception of preliminary engineering work in 1911 to the present time. The commission, also extended an invitation to Colonel Sherrill to sit in at conferences between the commission members and officials of the Cincinnati Street Railway during negotiations for the lease of the system.

The commission feels that a unified system of transportation would be for the best interests of the public. The $1,300,000 is needed to complete the branch to Oakley the last remaining link. This would include the laying of rails, the building of five additional stations and furnishing the sixteen stations which would then be established on the line.

The system has been completed as far as Bond Hill. From that point to Oakley the system would be above ground virtually all the way. The commission pointed out that the right-of-way has been obtained to the Oakley terminus. The $1,300,000, if authorized, will be expended as follows: laying of rails, $500,000; five additional stations, $175,000; furnishing stations, $66,000; completion of the last three contracts let, $240,000; laying of a third rail, $240,000, and restoration of right-of-way and incidentals, $79,000.

Dispute in Leavenworth Over Repaving Job

The Kansas City, Leavenworth & Western Railway was operating its cars, buses and interurban trains over the streets of Leavenworth, Kan., on March 27 without a franchise. The franchise under which the company has been operating for twenty years expired at midnight on March 26. City authorities said they would make no immediate effort to stop operation.

The company and the city are in a deadlock over the question of whether the company shall share a part of the cost of repaving Fourth Street. The company declares it is not able financially to bear the cost. The city authorities take the position the company will not be awarded a new franchise unless it shares in the paving cost.

The Kansas Supreme Court recently unheld the district court in a refusal to enjoin city authorities from running on the tax roll against the company about $7,000 in an assessment for repairs on Fourth Street in 1921. The company will appeal to the United States Supreme Court.

Higher Fare Sought in Salt Lake City

The Utah Public Service Commission has set April 12 as the date for hearing the fare petition of the Utah Light & Traction Company, Salt Lake City, Utah, filed on March 30, providing for a 10-cent cash rate, three metal tokens for 25 cents and the permanency of the weekly pass at its present prices.

E. A. West, general manager of the company, in a letter to the City Commission, informed the Council in answer to its demand that the company repair its right-of-way along the street car tracks, that the advanced tariffs would be necessary to meet the commission's demand. Mr. West also pointed out that a new wage scale effective on April 1, amounting to $25,000 increase annually, would further burden the company and make the advance all the more necessary. The letter which was read to the commission by the city recorder referred to the paving need and other items of additional expense, such as maintenance of equipment and track, which were necessary to render adequate and efficient service to the patrons of the cars.

An analysis of the railway earnings and expenses for the year 1925 showed that the rate of return, based on the valuation fixed by the commission, was 2.29 per cent. An analysis of the street railway earnings and expenses for the years 1921 to 1925 inclusive showed that the rate of return on the valuation as fixed by the commission had varied from 3.66, the highest in 1922, to 2.20, the lowest in 1924. During these years when the present fares were in effect the company expended approximately $30,000 to repair pavement.

In the new tariffs the company does not propose to make any change in the present rate for the weekly pass, that is $1.25 for the first zone, $1.75 for the first and second zones and $2.25 for the system pass. The present tariff provides for a student sale at the rate of 50 tickets in a book sold at $2. The new tariff will provide for 40 tickets sold for $2. The present tariff provides for the sale of regular tickets sixteen for $1 and under the new tariff three tickets for 25 cents will be sold on the cars. The present cash fare is 7 cents; the new tariff will provide for a cash fare of 10 cents. The new rates will yield, according to Mr. West, sufficient gross revenue to enable the company to take care of the proper repaving program and other increased expenses.

$100,000,000 for New Subways in New York

The Board of Transportation made a formal request to the Board of Estimate on April 5 for funds amounting to $100,000,000 to be spent in the construction of new subways. Included in the lines which this money is expected to build is the 53d Street subway and tunnel to Queens. The Board of Estimate, which met in committee of the whole, referred the request to its special calendar. Acting Mayor McKee, presiding in the absence of Mayor Walker, indicated that the board should consider the request carefully. When he said that the request seemed "a little exorbitant," W. G. Fullen, counsel of the Board of Transportation, stated that between $125,000,000 and $128,000,000 was needed by March 1, 1927. Up to date the city's contractual obligation for new subways had been brought to about $99,000,000.

The Merchants' Association has objected to the construction of the proposed 53d Street subway and tunnel to Queens at a cost of $30,000,000 as unnecessary, and has asked Acting Mayor McKee to postpone action on the request of the Board of Transportation for the reservation of $100,000,000 until after the meeting of commercial bodies on April 13.

Traffic Surveys Planned for Harrisburg and Lancaster

J. Rowland Bibbins, transportation engineer, Washington, D. C., has been called upon to study the transit, traffic and city planning problem of Harrisburg and Lancaster, two Pennsylvania cities. In the former a previous city planning survey had resulted in recommendations for such drastic changes in transit operation and routing as appeared to the railway to require re-examination independently from the viewpoint of economic transportation and provide more capacity for street traffic and realize city planning ideals.

The traffic surveys will be organized for seasonal observations and timed so as to secure first and normal average traffic conditions of the spring. They will then be repeated during the summer highway traffic peak to determine the relative traffic burden on the city streets due to local and interstate movement respectively. Special studies will be made of complicated transit and traffic crossings, the central square or clearing zone and the possibilities of expediting city transport through improved signal control by continuous instead of alternate "run and jump" block movement.

Both cities are located on important east-west national highways, the traffic from which has never been organized and routed to secure the maximum peak traffic burden on the central streets.

Further, adequate day storage areas will be so located as to relieve the transit streets of this uneconomic type of parking and make possible a reasonable graded parking in the business district according to normal business needs. Future main thoroughfares and transportation extensions will be laid out covering about 60 square miles of city environs.

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Action on Amendments to Cleveland Grant Postponed

Amendments proposed to the Tayler ordinance, under which the Cleveland Railway, Cleveland, Ohio, is operating, were not acted upon at the meeting of the Cleveland City Council on April 5.

It had been expected that all of the proposed amendments to the Tayler grant would be disposed of at that meeting, but the street railway committee of the Council was unable to reach a unanimous decision on an amendment which would provide for recognition of the union men and for arbitration by a board of three on wage and employment disputes.

The railway says it will decline such an amendment.

As a result, the amendments to the grant will not be acted upon until April 12.

Petitions were submitted to the City Council which had been circulated among the platform men and contained the names of 1,482 motormen and conductors, and 508 shop men, urging the passage of the Horr report provisions. The Horr report did not include the proposed union amendment.

John J. Stanley, president of the railway, said that more platform men had signed the petitions than had attended the union mass meeting. He estimated that four-fifths of the employees were opposed to the union amendment. Charges that signatures to the petitions were obtained through coercion and pressure were met by President Stanley with the declaration that anyone who resorted to duress would be discharged by the company. He declared that employees circulated the petitions themselves.

Municipality Fails to Operate Road Profitably

The Exeter, Hampton & Amesbury Street Railway, which for the past five years has been operated by the town of Hampton, N. H., is about to go out of existence. On April 6 the town applied to the Public Service Commission for permission to junk the line. The petition to the commission asks for authority to sell all the rolling stock, property and other equipment. Every possible attempt has been made to make the road a profitable venture. In the summer buses have been operated with more or less success. It is stated, however, that the terrific expense involved in keeping the line open in the winter season has eaten up any advantage incurred by summer operation. The patronage has also fallen off. The system includes 22 miles of railway.

Savannah Trainmen Win Accident Contest and New Hats

Savannah, Ga., triumphed over Jacksonville and Tampa in a six months accident contest and as a result employees of the Savannah Electric & Power Company are wearing new Easter hats. The final score showed that the winning men operated 2,946 miles per accident while Jacksonville operated only 1,116 miles and Tampa 993 miles. The record is considered particularly fine, as every trivial accident was reported and records made in anticipation of possible claims.

When the contest started the Savannah men organized themselves into six teams under team captains, and some of the men deputized themselves as instructors in the safe method of handling cars. The Savannah *Morning News* on April 4 says that the result demonstrated not only the capability of the Savannah trainmen but incidentally forced "Jacksonville and Tampa to spend real Florida money in Savannah to the tune of $600 or $700 dollars to pay for the new hats."

Praise for Chicago Surface Lines Storm Service

Full credit has been accorded the Chicago Surface Lines for the good work which it did in keeping every one of its lines in operation in the recent unprecedented snowstorm in Chicago. This really was a great achievement. Buses and taxicabs were practically out of business, and it was impossible for many hours to operate private automobiles. The company itself told in the daily press in paid ads the story of what this accomplishment meant in terms of faithful service performed by its staff.

The daily newspapers were quick to take cognizance of the significance of this performance. They, too, spread the story before their readers. This was merely one manifestation of the growing appreciation by the press of the part that the railway is playing in the civic life of the city, best illustrated, perhaps, by the following editorial from the Chicago *Evening Post*:

A few years ago the popular pastime of some of the local politicians was jumping on the Chicago surface lines. Five-cent-fare campaigns were the order of the day, the equipment was termed "junk" and the transportation held hopelessly inadequate.

Many phases of the criticism were justified, however distorted the remainder. Operating policies to the farepayer, at least, seemed dictated by the idea that the fewer the cars and the greater the crowds, the more the net revenues for the company. Service suffered as a result.

Then a certain operating vice-president was imported from Philadelphia who held rather peculiar theories. One of these was that the overhead expense on the equipment was practically the same, whether the trips per car were few or many. Therefore the more frequent the trips in the "slow" hours of the day, the more the possible patrons could be induced to ride, the better the service and the greater the revenues.

These theories were tried. The result is seen in the recent statement that the total number of rides in February was nearly 5,500,000 more than for February, 1925, and the daily average the highest in the history of the company. Furthermore, every month since last June has broken previous records in passenger totals for the corresponding months in the company's history.

There is still much which can be done in the way of extensions and other improvements in the city's transportation services, despite existing legal handicaps. Nevertheless, this record of the street car lines is one of the truly constructive achievements in the city's recent civic annals.

An Achievement IN SERVICE

FOR two days and nights, the operating organization of the Chicago Surface Lines battled the elements and won.

Street car operation was maintained in the face of the most severe snow storm Chicago has seen for years.

Aided by modern snow fighting equipment, more than 2,000 men worked manfully without thought of sleep or rest in the effort to keep open the arteries of transportation. Back of them was every department of this great system. Wreck-wagon crews, trackmen, linemen, shopmen, car repairmen—all did their utmost.

Hour after hour as the snow accumulated it was shoved back off the track to the curb line, leaving clear lanes of travel.

And the people of Chicago, three-fourths of whom depend upon street cars to take them to their daily occupations, found the cars on the job as usual.

But for the interference caused by other vehicles which quickly availed themselves of the lanes cleared for street car service, schedules would have been maintained with customary regularity.

There is no substitute for street car service.

CHICAGO SURFACE LINES

Thos. A. Wilson
President

Storms Do Not Daunt the Courage of These Public Servants

Spectacular Fire in St. Louis—Damage Small

A spectacular fire swept the power plant of the United Railways, St. Louis, Mo., on the west side of 39th Street between Vista and Park Avenues the night of April 2. The damage is conservatively estimated at $60,000.

That the loss was not much greater was due to the prompt response of the fire department and the efficiency of the company's employees. The moment the fire was discovered the generators and other machinery were shut down while the rotating sprinkler system with which the storage yards just west of the burned buildings was equipped thoroughly drenched the roofs of some fifty cars, the large garage building and other smaller buildings in the vicinity and prevented flying sparks from spreading the fire.

The fire temporarily hampered railway service on lines in that immediate vicinity and curtailed somewhat the service during the peak load period the next morning. The following day service on the Manchester, Market, Laclede, Sarah and Park division was cut down 20 per cent while on the Compton, Tower Grove and Cherokee lines no trailers were operated that day.

Richest Straphanger Hurt in New York Subway

John E. Andrus, known as the wealthiest straphanger, will remain loyal to the subway even though he was bowled over recently by a rush-hour crowd somewhere below the Brooklyn Bridge station. It was reported that an injury to his leg had resulted and had kept him home for several days. The 85-year old millionaire and optimist, at least as far as the subway is concerned, admits there was a trivial accident, but that he went on downtown to his office. He said it was a marvel that so few people were injured in the subway, considering the number carried by that system.

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Louisville Railway to Keep Abreast of City's Growth

The fourth of a series of advertisements has been prepared and run in Louisville newspapers by the Louisville Railway, Louisville, Ky., in which the growth of Louisville is stressed. One of these advertisements compared a population of 234,891 people in 1920, with 305,935 in 1925, or a 30 per cent gain. Bank clearings are compared over a ten-year period, with $742,390,281 in 1915, as against $1,743,589,890 in 1925, a gain of 135 per cent. Postal receipts for 1915 were $1,264,800, compared with $2,736,415 in 1925, a gain of 116 per cent. Building operations in 1915 were $4,836,278, compared with $35,082,781 in 1925, a gain of 625 per cent. After giving the figures on each of these, the company in bold face type uses a line "We, Too, Must Grow."

Additional advertisements along the same line will be run.

Information similar to that used in the press is also appearing on cards placed in the cars of the company.

Under the present straight 7-cent fare in Louisville, which, however, is on a sliding scale, the company can make a little money, but can't put away any funds for expansion and development. With a maximum 7-cent fare its securities are not sufficiently attractive to investors to permit the company to borrow advantageously so as to provide it with funds to supply adequately the service to which Louisville is entitled.

Bus lines have been installed and extended to take care of some of the territory near Louisville developed recently, but not all has been done that could be done. Suburban industrial sections have been developed along the lower city river front, but no railway facilities have been provided for handling the traffic, and there is not much prospect of the facilities being furnished, as the company hasn't funds available to construct the extensions.

Providence Cars Get New Dress for Easter

To harmonize with the spirit of spring, the equipment of the United Electric Railways, Providence, R. I., has been given a new dress. The color of the cars has been changed from dark to olive green, with cream trimming around sash boards and windows. Cream ceilings give a lighter effect in the interior.

Requests Continuance of Rockaway Trolley Service

At a conference before the Transit Commission on April 5 on the Long Island Railroad's proposal to discontinue the operation of its surface line between Hammels and Far Rockaway, Queens, Commissioner John F. O'Ryan asked the railroad representatives to defer action until July 10 to give time to arrange permanent bus service between the two points. Four bus routes have been proposed to cover the territory now served by the surface lines operated by the railroad between Hammels and Far Rockaway.

George Le Boutillier, vice-president and general manager of the Long Island Railroad, said that operation of the surface line on the steam train tracks from Hammels to Far Rockaway was dangerous. The road proposes to charge a 5-cent fare on this surface line from Neponset to Hammels, and then transfer passengers to the regular railroad trains, charging 12 cents from Hammels to Far Rockaway, making a 17-cent fare for the distance now served by trolley for 5 cents.

Operation to Continue in Ocean City, N. J.

Under an order signed by Chancellor Walker, Robert B. Chew will operate the Ocean City Electric Railroad, Ocean City, N. J., from now until Dec. 1. Application was made to the chancellor when the company expressed its intention of not operating its railway during this year. The trolleys have been operated under order of the chancellor for the last seven years. The line is 10 miles long.

Transfer Privileges Curtailed in Seattle

Transfer privilege on token fares will be discontinued on the lines of the Seattle & Rainier Valley Railway, Seattle, Wash., on April 25, according to a new tariff filed by the company with the State Department of Public Works. In future, transfers will be issued only on 10-cent cash fares. The company sets forth that in June, 1923, it began giving transfers on token fares with the understanding that it would be relieved from the franchise tax of 3 per cent on gross earnings, and also that the line would not be required to carry city policemen and firemen free. Pointing out that neither relief materialized and that negotiations which have been under way for some time to sell the line to the city are now deferred by a move to refer the proposition to the voters, the company declares that it can no longer postpone financial relief believed to be obtainable under the new tariff. It is considered likely that the City Council will issue an order that the Seattle Municipal Railway may issue transfers to the valley lines only on cash fares.

More About New Jersey's Paving Bill

In the closing hours of the session of the New Jersey Legislature the bill to relieve the electric railways of the state of the obligation to pay for paving between the trolley tracks had to be abandoned. It is estimated that enactment of the bill would have saved the railways an average annual expense of more than $500,000.

Vice-President John L. O'Toole of the Public Service Railway, who with Vice-President Edmund W. Wakelee directed the campaign in favor of the bill, declared when the fight was over:

> We made a clean open and aboveboard fight for this bill. We took the public into our confidence and put all our cards upon the table. We made a straightforward appeal for the abrogation of the old requirement that obliges us to pay for paving between the tracks. We have made the best fight possible and have lost. There is nothing more to be said for the present.

News Notes

Twenty-five-Trip Books in Effect.—The Public Service Commission has approved a local passenger tariff of the Rochester & Syracuse Railroad, Inc., Syracuse, N. Y., effective on April 1. Former regulations and fares governing the sale and use of 50-trip commutation books are canceled, and regulations and fares established for sale and use of 25-trip commutation books are limited to eighteen days from and including date of purchase. Changes in the rate basis will operate to effect reductions for distances in excess of 5 miles.

Department Store Charters Cars.—The Rhodes Brothers department store of Tacoma, Wash., chartered all the cars of the Tacoma Railway & Power Company on March 24 during the hour from 9 to 10 a.m. giving every passenger the privilege of riding free irrespective of his destination. Rhodes Brothers reported the greatest number of persons in the store during its entire history and an excess of business beyond their expectations. During the free transportation hour the cars carried several times the number of passengers usually riding at that hour.

Suggests Changes in Louisville Government.—By action of the Kentucky Legislature new methods of governing Louisville may become effective in 1929. Under the new law the City Council, instead of being made up of a Board of Aldermen and Board of Councilmen, will be composed of only one board, of twelve members, while instead of a Board of Safety and Board of Works, there will be only one board of three members. It is felt the change will result in less difficulty for the utilities in dealing with the city.

New Fares on Empire State.—The Public Service Commission has approved a new local passenger tariff of commutation fares of the Empire State Railroad, Syracuse, N. Y., effective April 1. The new fares are for books containing 25 tickets, good for passage in either direction between points specified thereon on the Syracuse-Oswego division (Baldwinsville, Fulton, Minetto, Oswego, Phoenix, Syracuse). The time limit is eighteen days from and including date of purchase. Changes in the rate basis will operate to effect reductions for distances in excess of 8 miles. The new rate supersedes former 50-trip commutation book fares with a time limit of 30 days.

Conductorettes Disappearing.—Women conductors are fast disappearing from the street cars of St. Louis, Mo. From a peak of 56 during the days of the World War their number has dwindled to ten. With the close of the war the United Railways adopted a policy of not employing any additional women as conductors, but it retained those in service at that time. The women proved satisfactory, but the company deemed it best to operate the cars with men. For the most part the women work on trail cars. None was used as motormen.

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Recent Bus Developments

Bus Service Started in Cincinnati

The Cincinnati Street Railway, Cincinnati, Ohio, entered the bus transportation field on April 1 by starting service on its two crosstown lines, designated Routes E and F. The routes serve suburban districts, heretofore without adequate electric or bus transportation. They are so arranged as to link up with nineteen electric railway lines. Route E is known as the inner crosstown line and Route F the outer. Transfers are issued from the buses to electric cars and vice versa. In the case where a passenger on an electric car requests a transfer to a bus with a car ticket, 2 cents additional must be paid, because the ticket fare is only 8⅓ cents while the bus fare is 10 cents straight. In addition to the crosstown lines the railway has several other routes on which service will be started before the end of this month.

Buses Under Commission Control in New Jersey

Two bills have been passed by the New Jersey Legislature and approved by the Governor which are expected to do much to stabilize bus operation. The first places the operation of all buses in the state under the jurisdiction of the Board of Public Utility Commissioners. In the past, the commission's approval has been necessary only for the operation of buses on the same street with street railway tracks. Elsewhere, a permit from the local municipality has been the only requirement. Under the new law, buses become public utilities regardless of the streets on which they are operated, and as such, are subject to the same regulation as other utilities. Henceforth, it will be impossible for a bus operator to enter into competition with an existing street railway by the expedient of laying out a route on a street parallel to the tracks but one block away.

Another provision of this legislation is that all buses shall pay 5 per cent of their gross receipts as a monthly franchise tax for the use of the streets. Heretofore such an arrangement has been in effect only in the larger cities and no uniform method of taxation existed in the smaller towns. Franchise agreements for the buses were subject to negotiation between the local officials and the operators, and were a prolific source of disagreement. Under the new law, a uniform method of payment is established applying equally in all municipalities regardless of size.

Gigantic Bus Merger in Northwestern Indiana

Twenty-five coach lines in northern Indiana would be combined into one company, under the name of the Shore Line Motor Coach Company, according to a petition filed on April 2 with the Indiana Public Service Commission. The merger, if approved, will combine the Gary Railways, Farina's Bus Line & Transportation Company, Inc., and B. P. Shearon, Hammond.

The bus lines are chiefly in the northwestern corner of the state, radiating from Gary, Hammond and Michigan City, Ind. Bus service operated by the Gary Railways within the city limits of Gary will not be affected by the proposed consolidation, but routes run by the railway from Gary to other cities are included.

The Shore Line Motor Coach Company has headquarters in Gary, with Charles W. Chase as president.

Railway Opposes Mount Vernon-New York Bus Service

Court action was started on April 2 by the Third Avenue Railway to stop sightseeing buses from being operated between Mount Vernon and Times Square, New York City.

The railway alleged that the buses were infringing on its transportation rights. In bringing the proceedings in behalf of the Westchester Electric Railroad, it asserts that service furnished by the trolleys, the New Haven, and New York Central Railroads, and the New York, Westchester & Boston Road is sufficient, without the proposed service by bus. It is further charged that the buses would compete with the electric railway and should be stopped for that reason. An order was served by an attorney of the railroad upon representatives of the Mount Vernon Sightseeing Company directing it to show cause why a permanent injunction should not be issued restraining operations.

Amended Petitions Before Minnesota Commission

The Minnesota Railroad and Warehouse Commission will hear amended petitions by the Twin City Motor Bus Company, subsidiary of the Twin City Rapid Transit Company, to revise bus routes so as to expedite travel between Minneapolis and St. Paul, Minn., and avoid long loops and vexatious stops and layovers. Original petitions had been filed by two bus lines before they were bought by the Twin City company. The plan is for peak-load headways of four minutes on the University line, eight on the Como line and six on the Selby-Lake line, with twenty minutes in each case in slack hours. It is planned to save ten to fifteen minutes on round trips. At Seventh and Hennepin Avenues in Minneapolis and Sixth and Roberts Streets in St. Paul, which all buses pass, there will be a combination service of a bus every two minutes. The one-way fare will remain at 25 cents. The street car fare is 16 cents cash or two tokens costing at the rate of six for 40 cents. An application will be considered also for two Minneapolis crosstown bus lines already in operation.

Bus Operation Extended at Newburgh

The Newburgh Public Service Corporation, Newburgh, N. Y., with permission of the Public Service Commission, has extended its route to include Orange Lake and Walden. The cash fare between Newburgh and Orange Lake is 20 cents, between Orange Lake and Walden 20 cents, and between Newburgh and Walden 40 cents. Fares for commutation tickets (two rides daily within current month) are $6 a ticket between Newburgh and Orange Lake and $12 a ticket between Newburgh and Walden. The Newburgh Public Service Corporation is the successor to the Orange County Traction Corporation.

Bill to Regulate Interstate Bridge and Tunnel Bus Traffic

Representative Bacharach of New Jersey has introduced at Washington a bill to permit affected states to regulate bus commerce through the interstate tunnel being built under the Hudson River between New York and Jersey City and over the interstate bridge now being constructed across the Delaware River between Philadelphia and Camden, N. J.

The measure would authorize the New York State Transit Commission, the Public Utilities Commission of New Jersey and the Pennsylvania Public Service Commission to prescribe by joint action terms and conditions under which buses could carry passengers through the tunnel or across the bridge. These bodies would be permitted to grant licenses for such transportation.

Co-ordination Urged at Indianapolis

Bus operation conducted independently is a wasteful form of transportation, according to attorneys for the Indianapolis Street Railway before the Indiana Public Service Commission in arguments touching on the conflicting applications of the company and the Peoples Motor Coach Company for permission to start bus routes in Indianapolis. The attorney declared the bus should be co-ordinated with an already established system of street railway transportation. He attributed the necessity for the 1-cent increase in street car transfer charges to competition from the motor bus in Indianapolis. If "wasteful independent" competition continues fares will have to be raised from time to time to meet losses sustained by the established transportation system. A decision will not be made for some time.

Bus Company Denied Appeal in Holyoke

The Interstate Bus Corporation, Hartford, Conn., was unsuccessful in its attempt to seek an appeal of the injunction issued on complaint of the Holyoke Street Railway, Holyoke, Mass. Through Attorney Edward H. Kelly the bus company has appealed the finding of a triple bench of the Supreme Court

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in February. Recently the railway and the bus corporation aired their differences in the county, criminal and civil courts and had their case settled by a triple bench of the federal court finding that Massachusetts bus control statutes were constitutional and the Interstate Bus Corporation was to be restrained from operating buses through Massachusetts cities without a license.

Litigations began with a suit by the Holyoke company to prevent the operation of buses between Greenfield and Springfield, Mass. The bus company brought proceedings in the federal court against the Holyoke Street Railway, alleging collusion in interfering with the bus business in Holyoke, Mass.

Extension of Service Allowed.—The Indiana Public Service Commission recently granted permission to the Chicago, South Bend & Northern Indiana Railway to extend bus service in South Bend and Elkhart.

Indiana Fares Advanced.—An increase of from 2 to 3 cents a mile has been granted by the Indiana Public Service Commission to the Indianapolis & Cincinnati Traction Company on its buses operated between Indianapolis and Shelbyville, Ind. The petition, filed some time ago by Charles L. Henry, receiver for the traction line, was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 13, page 462.

Buses in Evansville.—Five buses will be operated in Evansville, Ind., following permission granted to the Southern Indiana Gas & Electric Company to operate in certain sections of the city.

Permit Sought for "Shuttle" Line.—The Washington Railway & Electric Company, Washington, D. C., recently reapplied to the Public Utilities Commission for authority to operate a "shuttle" bus line from Foxhall Village to connect with its Burleith bus line at 35th Street and Reservoir Road. The company's original petition was denied, due to a financial agreement between the company and the real estate firm of Boss & Phelps. While the agreement by which the real estate firm guarantees the company against any loss for a period of five years still exists, no reference is made to it in the application. The rate of fare asked by the company is 10 cents cash with free transfers to its Burleith line. The Burleith line would issue free transfers to the Foxhall Village line on the payment of a cash fare only.

Petitions for Operation in Brookline.—Selectmen of Brookline, Mass., have granted the petition of the Boston Elevated Railway for permission to run a bus line from the Reservoir to Washington Square, Brookline, on Beacon Street, to Village Square, provided that the one-man car service be discontinued. The Selectmen, however, have given leave to withdraw on the petition of the Wellsley Coach Company to operate a bus line through Brookline on the proposed route from Park Square, Boston, to Wellsley. They have also given the Boston Elevated Railway permission to withdraw its petition to operate a line of de luxe buses from Coolidge Corner to St. Mary Street on a proposed route from Coolidge corner to the city proper.

Financial and Corporate

Traffic, Fare and Wage Figures Reported

Further increases were scored in the traffic of electric railways during the month of February, 1926, over the traffic carried in February, 1925.

The number of revenue passengers, including bus passengers, reported by the American Electric Railway Association by 205 companies was as follows:

February, 1926	751,106,093
February, 1925	742,372,772
Increase	1.18 per cent

The average cash fare in 272 cities having 25,000 or more population was:

March 1, 1926	7.6543 cents
Feb. 1, 1926	7.6470 cents
March 1, 1925	7.5147 cents

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 or more miles of single track were:

	Average Hourly Rate, Cents	Index No. (1913—100 per Cent)
March 1, 1926	56.58	207.61
Feb. 1, 1926	56.51	207.38
March 1, 1925	56.02	205.58

Inland Empire System Rearranged

Reorganization of the "Inland" system, operating interurban lines out of Spokane, Wash., was perfected late in March, when a legal arrangement was made whereby the Inland Empire Railway, now operating a line from Spokane to Moscow, Idaho, leases and operates the Spokane & Eastern Railway & Power Company's electric lines from Spokane, through the Spokane River valley to Liberty Lake and to Coeur d'Alene, Idaho.

With the merger of the city lines of the former Traction system in Spokane into the Spokane United Railway system, the sale of the Spokane & Eastern's power plant at Nine Mile to the Washington Water Power Company last year, the Traction and Inland properties are now simmered down to the two electric interurban lines, which the Inland Empire Railway will operate. The Inland Empire system was announced for sale by officers of the Harris Savings & Trust Bank, Chicago.

1,517,510,661 Ride Surface Lines

Net Earnings of Chicago Roads Were 8.78 per Cent Greater in Recent Year than During Previous Year, Despite 1,000,000 Additional Car-Miles Operated and Increase in Trainmen's Wages

HENRY A. BLAIR, president, in the twelfth annual report of the Chicago Surface Lines, points out that the year ended Jan. 31, 1926, was a record breaker in the number of rides and the amount of service provided. The report shows a total of 842,201,453 revenue passengers carried during the year—12,049,913 more than in the previous year. There were 1,517,510,661 rides, including both revenue and transfer passengers. Service has been increased to the extent of 1,184,821 car-miles. Mr. Blair said:

> No electric railway, I am convinced, ever has approached the end of its franchise period with its physical property in such splendid condition and with its management and operating personnel so thoroughly alert and so eager to serve.
>
> The firm confidence in the future of the street railway which has encouraged us to go forward and accomplish greater things than ever before, although these properties have no legal guarantee of future life, has been an inspiration to the industry throughout the country.

The daily average of revenue passengers in December, 2,408,510, was the highest for any month in the history of the system. The highest traffic day of the year was on Dec. 19, when 2,820,704 revenue passengers were carried. Total rides on that day were 4,971,129. Gross earnings showed an increase of 1.21 per cent, notwithstanding the fact that there was one less day in February than in February the preceding year.

Net earnings were 8.78 per cent greater than during the previous year, although more than 1,000,000 additional car-miles were operated and trainmen's wages were increased 2 cents an hour as compared with the first four months of the previous year.

The number of cars overhauled during the year was increased 47 per cent, and the total cost of overhauling was reduced 18 per cent as compared with the previous year. The good condition of equipment is indicated by the fact that more than 99 per cent of all cars were in operation in peak-load periods throughout the Christmas shopping season, and on two days all but seven of the 3,539 cars owned were on the streets giving service.

Since unification in 1914 gross earnings have grown from $31,966,049 to $58,785,881, an increase of almost 84 per cent. At the same time, however, operating expenses have grown from $19,889,276 to $46,628,207, an increase of 344 per cent, and operating wages from $10,560,039 to $29,012,642, an increase of 175 per cent. In the face of these large increases in expenses the average fare per revenue passenger has increased only 38 per cent, or from 4.99 cents to 6.90 cents. The average fare per ride is but 3.83 cents, due to the liberal transfer privileges.

During the nineteen years of the ordinance period the companies have invested new capital to the total of $107,733,000, a yearly average of $5,670,000. They have paid out $99,328,256 for public benefits, including paving, maintenance of paving, cleaning and sprinkling the right-of-way, general taxes and the city's 55 per cent of the net earnings.

During the past two years accident

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EARNINGS, EXPENSES AND DIVISION OF RESIDUE RECEIPTS OF CHICAGO SURFACE LINES FOR YEAR ENDED JAN. 31, 1926, COMPARED WITH PREVIOUS YEAR

Earnings	1926	1925
Passenger cars	$58,076,487	$57,284,602
Chartered cars	6,337	7,177
Newspaper cars	14,989	14,513
Freight earnings	4,867	4,786
Hospital car service	3,790	5,668
Advertising	274,480	267,773
Rents of buildings, etc.	165,150	133,083
Sale of power	104,097	234,451
Interest on deposits	120,682	114,948
Miscellaneous	14,997	14,673
Gross earnings	$58,785,880	$58,081,673
Expenses		
Way and structures	$2,830,649	$2,859,859
Equipment	3,984,635	4,148,282
Renewals	4,702,870	4,646,534
Power—maintenance	394,620	376,062
Power—operation	3,465,460	3,466,857
Conducting transportation—trainmen	20,741,205	20,890,865
Conducting transportation—other	3,172,423	3,177,461
Traffic	109,973	102,793
General and miscellaneous—damages	2,469,007	2,439,430
General and miscellaneous—other	1,697,361	1,551,803
Taxes	3,060,000	2,915,000
Total expenses	$46,628,206	$46,574,960
Residue receipts	*$12,157,674	*$11,506,717
Divided		
Chicago Railways — 60 per cent	*$7,294,604	*$6,904,030
South Side Lines — 40 per cent	*4,863,069	*4,602,687

* Includes city's 55 per cent of net divisible receipts, as defined by ordinances.

prevention work has resulted in 26 fewer fatal accidents and a very marked decrease in the total number of injuries.

In concluding his report President Blair says:

Service which constantly anticipates demand has brought increased business in the face of more vigorous competition and leaves no room for argument as to the necessity of street cars in Chicago. The public thoroughly recognizes this fact, and the propaganda which sought to create the impression that street cars are obsolescent is no longer credited.

We enter the last year under the settlement and unification ordinances prepared to give the best service and carry the greatest transportation load in the history of the system.

Comparisons of the extent of the Surface Lines' system at the end of the first year of unified operation (Jan. 31, 1915) and at the close of the twelfth year (Jan. 31, 1926) are given in an accompanying table:

COMPARISON OF FIRST AND TWELFTH YEAR OF UNIFIED OPERATION, CHICAGO SURFACE LINES

Items	1915	1926	Per Cent Increase
Gross earnings	$31,966,049	$58,785,881	83.90
Operating expenses	$19,889,276	$46,628,207	134.44
Operating wages paid	$10,560,039	$29,012,642	174.74
Total wages paid	$12,379,615	$31,534,182	154.73
Revenue passengers carried	627,731,550	842,201,453	34.17
Total rides	1,115,312,129	1,517,510,661	36.06
Average fare per revenue passenger	4.99 cents	6.90 cents	38.28
Average fare per ride	2.81 cents	3.83 cents	36.30
Trainmen in service	8,847	11,437	29.28

REVENUE PASSENGER STATISTICS OF CHICAGO SURFACE LINES

Year Ending	Weekday Average	Saturday Average	Sunday* Average	Total for Year
Jan. 31, 1926	2,424,194	2,507,004	1,631,484	842,201,453
Jan. 31, 1925	2,373,114	2,512,121	1,614,823	830,151,540
Jan. 31, 1924	2,354,139	2,521,487	1,623,414	824,850,103
Jan. 31, 1923†	2,234,425	2,356,385	1,563,911	762,629,211
Jan. 31, 1922	2,129,217	2,251,293	1,560,310	750,515,622

* Includes holidays. † Trainmen's strike Aug. 1 to 6, 1922, inclusive.

Mr. Blair said that annual purchases total about $6,000,000, necessitating the issuing of over 17,000 separate purchase orders. The average value of materials and supplies carried in stock is $3,000,000. In the past two years the cost to operate this department has been reduced from 4 mills to 2.5 mills per car-mile operated. This saving has been effected by consolidating disbursement centers and by careful supervision.

Accident prevention work among the employees has been continued with most encouraging results. In the two years since the department was established, there have been 26 fewer fatal accidents, including six fewer fatalities among the trainmen. A comparative record of injuries shows a material decrease. This improvement was made notwithstanding an increase in miles operated, passengers carried, employees in service and in number of cars and other vehicles on the streets.

The agreement with the trainmen's union based on the arbitration award in train service was 10.39 per cent, compared with 11.29 per cent in 1924 and 15.82 per cent in 1923.

The utility department was established on July 1, taking over the duties of the stable, wreck wagon and supply car department, combining jurisdiction over all service vehicles under the chief engineer. All horses formerly owned by the companies were sold and the department is now completely motorized.

The past year has seen no substantial change in the bus situation, aside from the fact that buses are being operated from adjacent cities in Indiana into Chicago. Mr. Blair cites the fact that two new routes were put in operation by the Chicago Motor Coach Company, and that an order of the Illinois Commerce Commission, denying the petition of the Chicago Surface Lines for a rehearing in the matter of granting to the Coach Company authority to operate certain temporary routes in the north division of the city was set aside by the Superior Court, on appeal, and the application of the Coach Company is now pending before the commission on rehearing. He says the Illinois Commerce Commission has under consideration the question of granting authority to the Chicago Railways to install an auxiliary or supplementary bus line on Diversey Avenue in lieu of a street railway extension.

Mr. Blair sees a marked improvement in the attitude of the public toward the company. There is a betteh understanding of the problems of street car operation and less inclination to criticise the Surface Lines for conditions over which it has no control.

Through staff and departmental conferences, department heads have been kept in close touch with the policies and accomplishments of the organization. Through *Surface Service Magazine*, meetings of department heads with employee groups and educational entertainments at the club house, employees have developed a personal interest in the character of service rendered to the public.

Through advertisements, car cards, *Service News* and publicity in the newspapers, and through the speakers' bureau, a motion picture film and contacts with civic and commercial or-

INCOME ACCOUNT OF THE CHICAGO CITY RAILWAY FOR YEAR ENDED JAN. 31, 1926

40 per cent of the residue receipts of Chicago Surface Lines		$4,863,069
Deduct: joint account expenses, interest on capital investment of the Chicago City Railway, Calumet & South Chicago Railway, and Southern Street Railway		3,521,158
Net earnings of South Side Lines		$1,341,911
City's 55 per cent as per ordinances		738,051
South Side Lines' 45 per cent as per ordinances		$603,859
Less: Southern Street Railway's proportion, as per ordinance		32,910
Company's proportion		$570,949
Add: interest on capital investment		2,790,302
Income from operation		$3,361,251
Other income—deficit		44,820
		$3,316,431
Interest on bonds and notes outstanding		1,737,425
Net income		$1,579,006
Add: surplus at Jan. 31, 1925		2,829,349
Surplus		$4,408,355
Dividends, 6 per cent		1,080,000
Surplus at Jan. 31, 1926		$3,328,355
Percentage of net income to capital stock at par		8.77

INCOME STATEMENT OF THE CHICAGO RAILWAYS FOR YEAR ENDED JAN. 31, 1926

Company's share (60 per cent) of residue receipts of Chicago Surface Lines		$7,294,604
Deduct: joint account expenses		70,646
		$7,223,957
Deduct: interest at 5 per cent on capital valuation		4,707,592
Income divisible with city of Chicago		$2,516,365
City's 55 per cent of divisible income		$1,384,001
Company's Income		
45 per cent of divisible income		$1,132,364
5 per cent interest allowance on capital valuation of property		4,707,592
Interest on bank balances		124,549
Interest on treasury securities		73,786
Profit on sale of treasury securities		4
Total income		$6,038,297
Deductions		
Interest accrued on—		
First mortgage bonds	$2,784,700	
Consolidated mortgage bonds	1,693,329	
Purchase money bonds	203,649	
Interest on loans	46,846	
Federal income tax on interest coupons	66,000	
Corporate expenses and interest adjustments with Chicago Surface Lines	182,222	
Total deductions		$4,976,749
Net income		$1,061,548

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STATISTICAL DATA OF CHICAGO SURFACE LINES FOR THE FISCAL YEARS ENDED JAN. 31

	1922	1923	1924	1925	1926
Rate of fare, cents	8	8 2-1-1922 to 6-14-1922 7c-6¾c 6-15-1922 to 1-31-1923	7-6¾	7-6¾	7-6¾
Revenue passengers	750,515,622	762,629,211	824,850,103	830,151,540	842,201,453
Passenger receipts	$59,706,412	$55,495,310	$56,986,687	$57,284,602	$58,076,487
Total earnings	60,343,733	56,103,061	57,655,169	58,081,678	58,785,880
Operating wages	29,676,981	27,163,996	27,458,736	29,246,390	29,012,641
Other operating expenses and taxes	16,839,168	17,252,072	17,381,016	17,328,569	17,615,564
Residue receipts	13,827,583	11,686,992	12,815,416	11,506,717	12,157,674
Less: joint account expenses	449,000	620,000	885,000	450,000	130,297
	$13,378,583	$11,066,992	$11,930,416	$11,056,717	$12,027,376
5 per cent on purchase price	8,024,104	8,039,343	8,076,569	8,127,158	8,169,099
55 per cent to city	2,944,963	1,665,206	2,119,615	1,611,257	2,122,052
45 per cent to companies	2,409,515	1,362,442	1,734,231	1,318,301	1,736,224

ganizations throughout the city, the public has been kept informed of Surface Lines activities. Such problems as parking, safety zones and traffic regulation have been discussed frankly and understandingly.

As a result, employees are giving loyal support to company policies and the public is displaying a greater friendliness and helpfulness than ever before.

The speakers' bureau, consisting of Surface Lines members of the Speakers' Bureau Committee of District 10, Illinois Committee on Public Utility Information, was reorganized in the spring. The motion picture, "The Magic of Transportation," was produced in the summer. More than 100 speaking engagements were filled during the fall and winter and a total audience of about 40,000 was reached either through addresses or the motion picture. The publication of *Service News*, containing Surface Lines information and circulating among business and professional men, was begun in March.

Exercise of Right of Exchange Urged at St. Louis

The reorganization committee of the United Railways, St. Louis, Mo., has notified holders of the St. Louis Transit Company improvement twenty-year 5 per cent gold bonds due on Oct. 1, 1924, and the holders of certificates of deposit for such bonds to exercise their right to exchange such bonds and certificates for stock in the reorganized company.

Under the reorganization agreement holders of the Transit bonds are authorized to subscribe for new common stock at $12.50 a share on the basis of ten shares of such new stock for each $1,000 principal amount of the bonds now held. The certificate and bondholders must signify their intention to subscribe for the new stock on or before May 1. The new stock must be paid for as follows: $4.50 May 1, $4 as of July 1, 1926, and the remaining $4 on a date to be fixed by the reorganization committee.

No-Par Non-Voting Stock Frowned On by New Jersey State Board

Predicating its refusal on the Interstate Commerce Commission's decision the State Board of Public Utility Commissioners of New Jersey on April 5 denied the application of the Delaware & New Jersey Transportation Company for approval of the issuance of 2,000 shares of common non-voting no-par stock.

The board pointed out that the commission held it would be inimical to the public interest to strip stockholders of its assets and the securities to be issued.

The case may appear to be a little far afield for record in the ELECTRIC RAILWAY JOURNAL on account of the type of company concerned, but the decision is of wide economic interest because it is a state board ruling on a controversial subject that has attracted wide attention recently.

TRACK MILEAGE—ALL COMPANIES OF CHICAGO SURFACE LINES

	Total Miles Single Track 1-31-25	Extensions 1925	Total Miles Single Track 1-31-26	Reconstructed 1925
Chicago Railways	591.16	3.18	594.34	25.19
Chicago City Railway	335.33	0.64	335.97	11.21
Calumet & South Chicago Railway	127.19	0.02	127.21	3.94
The Southern Street Railway	17.45	....	17.45	0.21
	1,071.13	3.84	1,074.97	40.55

voting power, thereby rendering it easy to control a company by a comparatively limited amount of investment.

The petition of the company requested the board to approve the following:

1. 4,000 shares of its 7 per cent cumulative non-voting preferred stock to be sold at a par of $50 per share.
2. 2,000 shares of its class A common non-voting no-par stock to be sold at not less than $20 per share.
3. 2,500 shares of its class B common voting no-par stock to be exchanged for the business of Healy Brothers, subject to debts of $76,741, as of Nov. 1, 1925, and to the lien of a mortgage of $9,000.

In refusing the preferred stock issuance the board said:

> The proposed issue of 4,000 shares of 7 per cent cumulative preferred stock does not provide for voting power in that class of stock at any time. This also is objectionable. Not infrequently the owners of preferred stock share with the owners of common stock equal voting rights.
>
> When this is not the case it is a common and in our opinion proper method of financing to vest the preferred stock with voting power upon default in the payment of dividends, especially if this extends over more than one quarter.
>
> The board is not disposed to approve an issue of preferred stock the holders of which might be deprived for an indefinite period of dividends without any voice in the management of the company. Nor is the objection overcome by the fact that the dividends on the preferred stock are cumulative.

The board said that the company could amend its charter and file a new application consistent with its findings to which it would give consideration to the value of the company's properties,

Road on Long Island Suspends

Promptly at midnight on April 5 all operations on the New York & Long Island Traction Company ceased. Cars that were out on the line finished their run at the carhouse, where they were put on the side tracks, the power shut off and 80 men automatically were out of jobs.

At the same time buses in every section of Hempstead, where the trolleys operated, began trips covering the same route and charging the same fare as did the railway. The company operated 41 miles of line.

Preparing to Liquidate Ohio Traction Company

Committees representing the common and preferred stockholders of the Ohio Traction Company, Cincinnati, have extended the time until April 20 for the shareholders to deposit their stock with the Western Bank & Trust Company. This action was taken in view of the fact that only two-thirds of the stock has been deposited.

The committees originally set March 31 as the final day for depositing the stocks in the plan for the distribution of the assets and liquidation of the company. The assets of the Ohio Traction Company consist of cash and Liberty bonds aggregating $1,000,000, 85,000 shares of Cincinnati Street Railway stock and properties which include the Cincinnati Car Company's plant at Winton Place, the Traction Building and Chester Park.

One of the plans under consideration is the conveying of the entire assets of the Ohio Traction Company to the Cincinnati Car Company and the issuance and distribution of stock in that company in proportional distribution to the common and preferred stockholders of the traction company.

Increase in Revenue in Tacoma

The Tacoma Railway & Power Company, Tacoma, Wash., earned in 1925 a revenue of $254,407, which included more than $100,000 later deducted for taxes. This amount is an increase of $29,352 over 1924. These figures were included in the annual report of the company submitted recently to the rate division of the State Department of Public Works at Olympia. Gross revenue was $1,301,876, while the operating expenses were $1,047,468. The number of passengers carried on the Tacoma Railway and its subsidiary, the Pacific Traction Company, totaled 24,608,652, a loss of more than 6,000,000 compared with 1924. The increase of revenue in the face of this loss in passengers was explained by the fact that operating expenses during 1925 were $217,264 less than in 1924. The decrease in patron-

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age is believed to be due both to the rise in the price of the weekly pass and to the jitney service, which cut into the railway's receipts, particularly on certain lines.

Utilities at Coral Gables Pass to Florida Power & Light

The Florida Power & Light Company has purchased the public utilities of Coral Gables, and has executed a contract for the operation of the Flagler Street and Coral Gables rapid transit lines. The total consideration is $1,250,000. Coincident with the announcement a statement was issued by J. H. Gill, general manager of the Florida Light & Power Company, in which he said that the time has come for the extensive expansion of the distributing system, both in water and electricity.

Utilities of Coral Gables comprise at present the light and water facilities, started by the company for the residents, while the suburb was in process of early development. A franchise acceptable to the Florida Power & Light has been drawn up and adopted by the Coral Gables City Commission. It is announced that cars for the rapid transit line will be shipped from St. Louis this week.

The Florida Light & Power Company serves cities and communities in nearly every section of the state. In Miami and Coral Gables the power company owns and operates the water and light systems, and in Miami it owns and operates the gas system. All of the car lines of this district are now under control of this company; also the city of Miami bus lines.

Standard Gas & Electric in Important New Deal

The Standard Gas & Electric Company has acquired control of the Standard Power & Light Corporation, which, in turn, controls various utility organizations supplying Pittsburgh and surrounding territory with electricity, gas and railway service, and approximately three-fourths of the railway business in San Francisco.

Among the companies included in the merger, directly or indirectly, are the following: United Railways Investment Company, California Railway & Power Company, Market Street Railway, Pittsburgh Utilities Corporation, Philadelphia Company, Duquesne Light Company, Pittsburgh Railways and Equitable Gas Company.

Majority control in all these companies is represented, except in the case of the Market Street Railway, where 40 per cent of the voting control is owned. H. M. Byllesby & Company, investment bankers for the Standard Gas & Electric Company, will shortly make offers to the minority stockholders of the United Railways Investment Company, California Railway & Power Company, Pittsburgh Utilities Corporation and the Philadelphia Company to exchange their stock for securities of the Standard Gas & Electric Company in order to acquire the minority stock of these companies for its subsidiary, the Standard Power & Light Corporation.

For some time the Standard Power & Light Corporation has been controlled jointly by Ladenburg, Thalmann & Company, and the Standard Gas & Electric Company. The former firm will retain a substantial financial interest, and Moritz Rosenthal, of Ladenburg, Thalmann & Company, will remain chairman of the board of the Standard Power & Light Corporation and subsidiaries. Ladenburg, Thalmann & Company will continue with H. M. Byllesby & Company as bankers for the properties.

John J. O'Brien, president of the Standard Gas & Electric Company, said:

> The management of the Philadelphia Company and its subsidiaries serving Pittsburgh and vicinity has been excellent, and no changes are contemplated in the personnel of these organizations. A. W. Thompson, I am glad to say, will remain president of the Pittsburgh companies, and his highly efficient staff will have the full support of the Byllesby Engineering & Management Corporation. Management of the Market Street Railway was taken over some time ago. We hope, of course, with our large specialized organization to continue the improvement of operating results for the mutual benefit of the public and investors.

Plan for Reorganizing Illinois Road Approved

Under a plan approved by the Interstate Commerce Commission and the Illinois Commerce Commission title to the Springfield-Pekin line of the Chicago, Peoria & St. Louis Railroad will be taken by a new corporation known as the Springfield, Havana & Peoria Railroad. When rehabilitated, the line will be operated under contract by the Chicago & Illinois Midland Railway. The Springfield, Havana & Peoria Railroad has 110 miles of trackage extending from Springfield to Pekin. Electrification is now under consideration, according to J. F. Gilchrist, a vice-president of the Commonwealth Edison Company of Chicago, the new owner. Mr. Gilchrist is also president of the Chicago & Illinois Midland Railway.

The financing program of the old Chicago, Peoria & St. Louis Railroad, always an unsuccessful enterprise, provides that the Midland shall issue $4,600,000 of bonds and $600,000 of stock. Of the bonds, $2,500,000 will be used to refund a like amount of outstanding Midland bonds. Of the remaining $2,100,000 of Midland bonds, the proceeds of $1,960,000 will be used to purchase $1,960,000 of the new railroad's bonds. These bonds will be bought at par and the proceeds put into the new railroad, $625,000 in cash to the bondholders of the Chicago, Peoria & St. Louis Railroad for the old right-of-way and the remainder for construction. The remaining $140,000 of Midland bonds and $100,000 of the Midland stock will go for new equipment. The remaining $500,000 of Midland stock will be exchanged for the new road's $500,000 of stock, and this will be taken by the Commonwealth Edison Company on account of the new right-of-way and on account of working capital, organization expenses and the contingencies of railroad organization, construction and general rehabilitation.

Reference has been made before in the ELECTRIC RAILWAY JOURNAL to the plans which the Insull interests have in mind for rehabilitating this property.

Representatives of Public on Madison Board

Three men prominent in different businesses in Madison, Wis., have been added to the board of directors of Madison Railways, increasing the board from four to seven members. Their election, declared Dudley Montgomery, vice-president, is in line with the company's policy to established closer contact with the residents by allowing public representatives to participate in the affairs of the company.

Hulswit Out of American Light & Traction

According to the *Wall Street News* the Hulswit interest has been eliminated to all intents and purposes from the American Light & Traction Company. The same authority says that other interests in United Light & Power, which incidentally increased their holdings of United stock when the Hulswit stock was taken over in the market débâcle of the shares, still come close to being the dominant factor in the affairs of American Light & Traction.

As an indication of the stock holdings of interests in United Light & Power Company, of which Mr. Hulswit formerly was the head, in American Light & Traction, four at least, and probably six, directors representing or having close connections with United Light were recently placed on the American board. At the same time that Mr. Hulswit resigned as a director of American Light, C. S. Eaton, of Otis & Company, which headed the syndicate taking over the Hulswit United stock holdings, John S. Brooks and W. F. Rust of the Koppers Coke of Chicago, Richard Shaddelee, now president of United Light; William Chamberlain and Donald MacArthur were added to the American Light board.

Mount Tom Property to Be Sold

The directors of the Holyoke Street Railway, Holyoke, Mass., have been authorized to sell the Mount Tom property of the Mount Tom Railroad and the Mountain Park property of the Holyoke Street Railway. The Mount Tom property includes more than 500 acres, with the Summit House. The Mountain Park property comprises 350 acres, with theater, dance pavilion and other buildings. In the event of the properties being sold the companies will retail rights of way for the operation of their lines. In referring to the Mount Tom Railway, L. D. Pellissier, president of the Holyoke property, was of the opinion that if operated by private owners it would be managed better. The Mount Tom Railway was under lease to the Holyoke Street Railway for a term of years. Regarding the proposed sale, no actual party has approached the owners. Conrad J. Hemond of the Holyoke Chamber of Commerce said that either the Holyoke Street Railway or the Mount Tom Railway was under an ancient agreement to give the state the first opportunity to purchase the Mount Tom property. The city of Holyoke wants the advantages offered by the mountain maintained, but Mayor Scanlon is very much opposed to the city's buying it.

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Directorate Vacancies Filled.—At a meeting of the directorate of the Portland Electric Power Company, Portland, Ore., held on March 24, two new members were elected. E. B. MacNaughton was chosen to fill the vacancy left by the resignation of W. M. Ladd, and W. H. Lines, in charge of street railway operation, will take the place of the late F. I. Fuller. At the same meeting directors were empowered to change by-laws for future financing plans of the company. These plans include the elimination of bond sales, issuance of preferred and common stocks, and a reduced par value on common stocks. Capital needs of the company amount to $6,450,000—to meet notes, finance operations and provide for new property purchases.

Dividend Increase by American Light & Traction.—Directors of the American Light & Traction Company, New York, have declared an extra dividend of 2 per cent on the common stock and also a regular quarterly dividend of 2 per cent. The quarterly dividend places the stock on an $8 annual dividend basis, an increase of $1.

Bonds Fast Being Deposited.—Frank O. Wetmore announces that $2,747,000 of Chicago City Railway first mortgage bonds out of a total of $33,926,000, and $554,000 Calumet & South Chicago bonds out of a total of $5,458,000 have been deposited with the protective committee recently formed.

Dividend Payments Show Success of Savings and Loan Plan.—The Board of Directors of the United Railways Savings & Loan Association, St. Louis, Mo., have declared the 22d consecutive semi-annual dividend of 6 per cent payable to the members of record March 1, 1926. This dividend totals $92,764, bringing the grand total paid to the members since the association formed up to $744,691. The body has never paid less than 6 per cent compounded semi-annually. It is composed of employees of the United Railways and its purpose is to encourage home ownership. It has been very successful, having placed 1,956 members in their own homes. It now has 5,798 members. The association has assets of $3,750,000.

Wants to Remove Tracks—The Alabama Power Company has filed a petition with the Alabama Public Service Commission asking authority to take up its car tracks from Montgomery, Ala., to Pickett Springs, some distance out of the city. It is set out in the petition that the line no longer pays. It was built to serve an amusement park, which has since been abandoned.

Taxes Abated. — The Connecticut State Board of Control at a meeting on April 1 voted to abate taxes due the state from the Hartford & Springfield Street Railway, Warehouse Point, Conn., to the amount of $62,336. The company owed $73,250 in taxes from 1917 to 1925. In that time it paid the state $29,418 taxes and planned to pay the 1917 taxes amounting to $10,913.

Illinois Right-of-Way Bought.—John H. Thornburn, president of the Urbana Banking Company, Urbana, Ill., has purchased the Kankakee & Urbana traction holdings, including the right-of-way between Urbana and Paxton, a distance of 26 miles, for $119,000 in satisfaction of a judgment on a mortgage under foreclosure sale on March 27. He does not expect to operate the road himself but farmers are making every effort to insure continuation of the freight service. Operations were suspended on March 26.

Messrs. Gates and Thompson Elected to New Jersey Board.—At the annual meeting of the Public Service Corporation of New Jersey, Thomas S. Gates of Drexel & Company, Philadelphia, Pa., was elected a director for one year to fill the unexpired term of the late Randall Morgan, and Paul Thompson, a vice-president of the United Gas Improvement Company, was elected a director for three years, succeeding Lewis Lilly.

New Director Elected.—At the annual meeting of the Olean, Bradford & Salamanca Railway, held at Olean, N. Y., recently, W. A. Graves of Olean was elected a director.

190,052,285 Passengers in Altoona.—The annual report of the Altoona & Logan Valley Electric Railway, Altoona, Pa., shows a total of 190,052,285 passengers, including transfer passengers, carried on the traction lines, and 834,892 passengers carried on the buses of the Logan Valley Bus Company during the year 1925. Not a fatal or serious accident to a passenger was reported in the year. One of the largest items of expense was for eleven new cars at a cost of $196,000. Trackwork and paving cost $123,223 and repairs to trolley equipment cost $85,109.

Book Reviews

Depreciation in Public Utilities

By Delos F. Wilcox. National Municipal Review, New York. 112 pages, $2.

This is the second monograph in the series which is being published by the National Municipal League, intended so to present the more or less technical problems of local government as to be of value to administrators, technicians, and students of government.

"Depreciation in Public Utilities" by Dr. Wilcox presents the relation of accrued depreciation to annual depreciation and maintenance. He has presented in this monograph the theory and application of accrued depreciation as particularly related to street railways. He has shown why he thinks this method of treating depreciation in public utilities is preferable to other methods. To substantiate his position he has summarized the experience of a number of municipal railway systems.

Forecasting, Planning and Budgeting in Business Management

By Percival White, marketing counselor. McGraw-Hill Book Company, New York. 267 pages, price, $2.50.

Modern practice in business planning is the subject of this manual. The book discusses the sources of data and the factors in forecasting and shows how to apply general business statistics to individual businesses and also to specific departments. It outlines practical plans for budgeting industrial activities and shows the executive how to forecast, schedule, plan and make his budgets on a scientific basis.

Railway Track and Maintenance

New Fourth Edition by E. E. Russell Tratman, associate editor *Engineering News-Record*. McGraw-Hill Book Company, New York. 490 pages, price $5.

This is a reset edition of this standard manual of maintenance-of-way and structures. The book includes the bridge, signal, telegraph, and other special departments, shows the relation of the track and its maintenance to railway operation, and presents their financial and economic aspects. Systems of practice everywhere applicable, details as to equipment, material, appliances, and methods used by individual railways in different parts of the country are included. In this way the book has been brought up to date.

Consolidation of Railroads, Second Supplement, 1925

Published by Library Bureau of Railway Economics January, 1926.

This is a 22-page mimeographed compilation of the various books, pamphlets and newspaper comment on railroad consolidation. An index of authors is included.

A Review of Railway Operations in 1925

By Julius H. Parmelee, Director Bureau of Railway Economics. Reprinted by permission from *Railway Age* for Jan. 2, 1926, and figures revised to Feb. 10, 1926.

Charts and tables showing the year 1925 in the steam railway field are contained in this 32-page pamphlet. A general summary of the results of the year are included with some details on financial results, operating efficiency and railway personnel.

Handbook of Modern Electric Railway Methods and Practices, 1925

Published by American Electric Railway Association; 319 pages, illustrated, $2.

Data collected by the 1925 committee on management and operation are contained in this book. There are twelve sections to cover the divisions of the subject treated; the number of items in a section being as many as 140. The data are collected from a number of sources, including the technical papers and contributions by railway companies. The items presented are not limited to improvements made during 1925.

Although some of the material printed is in somewhat undigested form, the volume contains a great deal of instructive information and calls attention to many items of practices that have been instituted by various operating properties. While some of the material presented is more suitable for publication in periodicals rather than permanent book form, it brings together in one volumn a valuable compendium of methods and practices. Its preparation was the result of tireless effort by a large and representative committee, which has devoted a great deal of time and energy to the collection of the material.

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Personal Items

Changes in New Bedford Significant

Elton S. Wilde, New President, Fills Post in Which Henry Crapo Scored Remarkable Success

Henry H. Crapo's retirement from the active executive connection with the Union Street Railway, New Bedford, Mass., referred to in the ELECTRIC RAILWAY JOURNAL of April 3, page 616, accentuates recollections of the romantic history of his affiliation with this Massachusetts property, the outstanding development and success of which have been accredited to his splendid management. It is one of the few electric railways in the East that has continued uninterruptedly to operate with the nickel as a unit, and it is often cited in legislative and in financial circles as an example of what can be done in the successful conduct of a railway property.

H. H. Crapo

E. S. Wilde

E. F. Nicholson

PRESIDENT SINCE 1894

Back in November, 1894, when the lines of the Union Street Railway had been electrified and the old horse-drawn cars eliminated, Mr. Crapo was elected president of the corporation. At that time, however, there was no suggestion of his taking active management. Some say that it was a caprice of young Henry working in the famous law firm of Crapo, Clifford & Clifford to have his fling at engineering a railway and that his father, the late William Crapo, acceded to his wishes. Others claim young Crapo's connection with the railway was directly attributable to a plan of H. H. Rogers, interested in the car service afforded to the town of Fairhaven. Mr. Rogers suggested that he and the late William Crapo should purchase a block of the railway stock and give active control of the railway to Henry Crapo. Whatever the origin of the idea, the destiny of the road has been in Henry Crapo's hands ever since.

The growth of the company under his management is indicated by comparison of the 18.35 miles of trackage in 1894 with the 60.57 miles it has now. This expansion involved a similar enlargement of the capital investment, which grew from $882,648 in 1894 to $5,035,084 in 1926. The increasing service it has been called upon to perform is shown by comparing the 4,370,355 passengers carried in 1894 with the 27,197,275 transported on the company's vehicles during 1925. In 1894, the total number of car-miles run by the company was 667,746, while in 1925 the tremendous total of 3,322,318 was piled up. One of the first big developments undertaken by the company after Mr. Crapo took charge was the double-tracking of the Purchase Street line, which at first was a single-track affair with turnouts. This was done in 1898. In 1901 the tracks of the Union Street Railway were extended to meet the New Bedford and Onset line, and this company came under the same management. Mr. Crapo was largely responsible also for the artistic development of Fort Phoenix, and the buildings and layout of the grounds there are chiefly the result of his planning.

Mr. Crapo was graduated from the Harvard Law School. He was considered an authority on street railway law, especially that prevailing in Massachusetts. His counsel on such matters was sought throughout New England, since it was known that he had made a special study of the subject. It was during his term of service as president of the Union Street Railway that the railway laws of the state were codified under the supervision of William W. Crapo, his father, and he had unusual opportunity for gaining first-hand knowledge of the subject both as an operator of a railway and from the legal standpoint. Mr. Crapo was associated with several local manufacturing and industrial establishments, and was also a director in several banks and was always interested in numerous charities. Although he declined re-election as president of the railway, Mr. Crapo will continue a director.

His successor, Elton S. Wilde, has been identified with the company almost as long as his predecessor. It was in 1897 that he became identified with the Union Street Railway. He had been employed as office boy in the law office of Crapo, Clifford & Clifford, where he absorbed much knowledge of general business methods. After becoming affiliated with the Union Street Railway he served in various capacities, acquiring a comprehensive knowledge of the railway business. On Nov. 27, 1901, he was elected by the stockholders as treasurer of the company. He continued in this office until Jan. 16, 1908, when on the retirement of Edward E. Potter he became general manager of the company. He was elected a director of the company on Jan. 16, 1913, and also its vice-president. He continued in this capacity until March 26, 1926, when on the retirement of Henry H. Crapo he was elected president of the company.

It has been said of Mr. Wilde's success as a street railway man, that he always regarded his work as being of absorbing interest. He was always alert to understand the broader aspects of the general business and the needs of the community. With these qualifications he has been in great demand by civic organizations and by other railways. In 1913 he served as president of the New England Street Railway Club, and has served on several A.E.R.A. committees. He is a past-president of the Board of Trade and Rotary Club. Mr. Wilde was born in Fairhaven, Mass., in 1879.

VICE-PRESIDENT A 25-YEAR MAN

Edward F. Nicholson, the new vice-president, who will continue to hold the position of treasurer, entered the employ of the company in 1900 as a bookkeeper. Shortly after this the New Bedford & Onset Street Railway established its electric express service between New Bedford and Onset, and Mr. Nicholson was selected as manager of this department. Later the express service was extended to Fall River and still later to Providence with Mr. Nicholson in complete charge. In 1908 he was elected treasurer of the company to succeed Elton S. Wilde. Later he was elected a director in the company. He continued in this capacity until last month when he was elected

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vice-president and treasurer. Mr. Nicholson has worked diligently, unaware of how many hours constituted a day's work. He was educated in the New Bedford schools.

Ernest Baines, the new assistant treasurer of the railway, entered the company's employ in 1917. He worked in various capacities in the accounting department until March 1, 1920, when he became Mr. Wilde's private clerk. He, too, was appointed on March 26 of the present year. Mr. Baines was born in New Bedford.

Changes in Title in Portland

O. B. Coldwell, vice-president of the Portland Electric Power Company, Portland, Ore., has announced three changes in title in his organization.

C. P. Osborne, formerly superintendent, is now general superintendent.

R. R. Robley, recently operating engineer, is now superintendent.

C. P. Dunn, electrical engineer, has been titled chief engineer of the light and power department and will have supervision henceforth over designing engineers, electric draftsmen, structural draftsmen, map draftsmen, valuation engineer, engineers assigned to construction, testing engineer, right-of-way engineer and assistant engineers.

G. F. Hardy and J. W. Hungate Advanced by Inland Empire

Following the appointment of W. P. Johnston as operating head of the Inland Empire system at Spokane, Wash., succeeding the late Waldo G. Paine, other changes in the personnel were announced. George F. Hardy, traveling freight and passenger agent, has been made assistant general freight and passenger agent, and J. W. Hungate is the new superintendent of the operating and electrical departments, replacing J. F. Gannaway, a veteran employee, who has been granted an indefinite leave of absence due to illness.

A. W. Whiteford assistant trainmaster for the Denver & Interurban Railroad (Kite Route), Denver, Col., has been named passenger agent, filling the vacancy caused by the death of Charles W. Richards. Mr. Whiteford has been connected with the Colorado & Southern Railroad, owners of the Kite route, since 1894 and has been with the "Kite" since its organization. He will continue to serve as assistant trainmaster.

George L. Burgain, a motorman on the Jefferson Avenue line of the International Railway, Buffalo, has been elected a member of the board of directors of the company to represent the Employees' Co-operative Association, of which he is president. Mr. Burgain has been in the employ of the company four years. He succeeds J. E. Deaton, on the board of directors of the company.

W. H. Munro has been appointed manager of the Nova Scotia Tramways & Power Company, Ltd., of Halifax, N. S. He was formerly sales manager of the Canadian Vickers, Ltd., of Montreal.

William H. Dougherty, for 37 years an employee of the Williamsport Passenger Railway, Williamsport, Pa., resigned recently. For the past 26 years Mr. Dougherty served as dispatcher.

F. J. Stevens is master mechanic of the coach division of the Miami Beach Railway, Miami, Fla. The company has recently entered the bus field in a large way. Mr. Stevens was formerly connected with the service department of the Fageol Company at Kent, Ohio. Before that he was master mechanic on several electric railways in New York, New Jersey, Indiana and Pennsylvania.

Truman E. Curtiss, superintendent of transportation for the Chicago, Aurora & Elgin Railroad, third-rail line, has resigned to enter the real estate business. He has been a resident of Wheaton, Ill., since 1920. Before that time he was superintendent of the local Wheaton system.

Burt Fleeger has resigned as treasurer, sales manager and a director of the Sivyer Steel Casting Company, Milwaukee, Wis., to become associated with the Oklahoma Steel Castings Company, Tulsa, Okla., as vice-president.

Obituary

Edward F. Schneider

Edward F. Schneider, known as the father of the "Safety First" movement, died on March 31 in Cleveland. He was formerly general manager and one of the organizers of the Cleveland & Southwestern Railway, Cleveland, Ohio. Previous to assuming that position in 1911, he was for thirteen years salesman with the Benton Hall Company, wholesale druggists.

Mr. Schneider gained nation-wide prominence in his indefatigable efforts to make the safety movement a permanent one. He contributed several articles to the ELECTRIC RAILWAY JOURNAL on this subject. In one of these he said that there arose the question of whether the magic words "safety first" had not spent their force and lost their effectiveness. He himself preferred to refer to the work as the "prevention of accidents" rather than the "safety first movement." He said that though we heard and saw employees and public refer to safety first signs in a jocular way—saw safety pins and cards mis-used in advertising stunts and saw the slogan used by bank and trust companies and many manufacturing businesses, he was of the opinion that accidents could be prevented only by using moral suasion and developing a proper spirit in the employee. He said the plan should be to educate employees along the lines of their duty toward themselves, their fellow-men, and their companies and reach the public through the schools. Then he believed satisfactory results were sure to follow.

Mr. Schneider was born in 1862 in Toledo. He attended the Baldwin-Wallace College, Berea, and the Philadelphia School of Pharmacy.

Clarence Price

Clarence Price, formerly vice-president and a director of the American Car & Foundry Company, died on April 2 at his residence in New York, at the age of 63, after a two months illness.

Mr. Price entered the railroad business as purchasing agent of the Chicago & Alton and soon won the high regard of President Felton, who made Mr. Price his confidential aid. He left Chicago in 1903, when he was made vice-president of the American Car & Foundry Company. Thereafter he made his home in this city, devoting his main energies to the affairs of this company until his retirement from active business a few years ago. He then relinquished all his directorships, including that of the New Haven Railroad.

Mr. Price was reared in Cincinnati. He was graduated from Princeton in 1885.

R. A. Smithson

R. A. Smithson, Leeds, England, died on March 25. Mr. Smithson was a member of Leeds City Council for more than 30 years. When the municipal tramways committee was formed in 1898, Mr. Smithson was appointed its chairman, and ever since, with exception of two years, he held the post of chairman or deputy-chairman. During his tenure the system was extended greatly and it became one of the largest and most successful tramway undertakings of its kind in Britain. Mr. Smithson was prominently associated both with the Municipal Tramway Association and the Tramways and Light Railways Association. As he was by profession an accountant his services were of great value, especially on the financial side of tramway industry. Mr. Smithson was 65 years of age.

James Edward Etchells, a director of the Biddeford & Saco Railroad, Biddeford, Me., died in Biddeford on March 26.

Charles Y. Hogberg, for more than 30 years connected with the Brooklyn Rapid Transit Company and the Brooklyn-Manhattan Transit System, died on March 23 at his home in Brooklyn. Mr. Hogberg in recent years has served as superintendent of the East New York Division. He was 57 years old.

Perry Fankboner, veteran employee of the Springfield Traction Company, Springfield, Mo., died recently. In 1886 he entered the employ of the Springfield Traction Company as a driver on a mule car. In 1894 when the mule cars were replaced by the trolley, he was promoted to the position of train master. For many years he held this title and was actively in charge of routing of all cars, schedules and other matters pertaining to movement of cars.

Col. John L. Wisdom, organizer and first president of the Jackson Suburban Street Railway, now the Jackson Railway & Light Company, Jackson, Tenn., died recently. Mr. Wisdom's first work was that of contractor, having superintended the construction of the eastern section of the old Tennessee Midland Railroad. He was 75 years old.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

G. A. Barnes Assumes New Office with Galena

George A. Barnes was elected vice-president of the Galena Signal Oil Company at a meeting of the board of directors held at Franklin, Pa., on April 1. Several changes in the board were also made at this meeting. William P. Westcott and J. C. Tipton, New York, resigned as directors, and C. W. Hochette, New York, and John C. O'Connor, Franklin, were elected. Mr. Westcott retired from active service, but Mr. Tipton will continue as export manager. Mr. Westcot resigned also as vice-president and treasurer, the former office to be filled by Mr. Barnes, while Mr. Hochette becomes treasurer. The vacancy created by the resignation of Leon E. Stull as assistant treasurer was filled by the election of J. French Miller to that office in addition to his duties as secretary.

The appointment of J. E. Linahan, vice-president, to head the sales and service department, was announced. Hereafter the sales department will be located in Franklin. C. A. Miller was appointed manager of the purchasing department to succeed Ralph P. Byles, Oil City, resigned.

Hope for Electric Operation of I. C. Terminal by July 1

Work on the Chicago terminal electrification of the Illinois Central Railroad is being carried on at top speed. In addition to extensive rearrangements of existing track and construction of additional roadbeds, enormous strides have been made in the work of electrification proper. For the catenary supports concrete foundations have been placed, 80 per cent of the steel structures erected and the overhead conductors placed on the South Chicago branch and for about half the distance on the main line. An extraordinary effort is being made to initiate electrical operation on July 1, 1926.

Substations, which will energize the various electrified lines, are all in process of erection. Some of them have progressed sufficiently for installation of electrical equipment. These substations will be owned and operated by the Commonwealth Edison Company, which will deliver traction current at 1,500 volts and miscellaneous light and power supply at 4,000 and 2,300 volts.

Complete information on the technical operating features of the Chicago terminal improvement was given in the issues of the ELECTRIC RAILWAY JOURNAL for Aug. 22 and Sept. 5, 1925. Introduction of electric traction by the Illinois Central comes as one phase of an agreement reached by the city, the railroad and the South Park Commission, in 1919. Under the terms of the agreement, the company was to put electric operation into effect as follows: Entire suburban service by Feb. 20, 1927; freight service north and south of Roosevelt Road by Feb. 20, 1930, and 1935 respectively; all through passenger service by Feb. 20, 1940, provided that a given percentage of the railroad using the Lake front passenger terminal is operating electrically at that time.

Initial electrification for surburban service includes two parallel tracks on the main line and one or two tracks on branches with approximately 110 track miles along 37 miles of route. Ultimately there will be 417 miles of track, including the yards and sidings, and it is necessary to anticipate as many as fifteen main line tracks in some sections. Electrification work is being carried on under contract by the Pierce Electric Company.

Equipment Trust Terms at Detroit

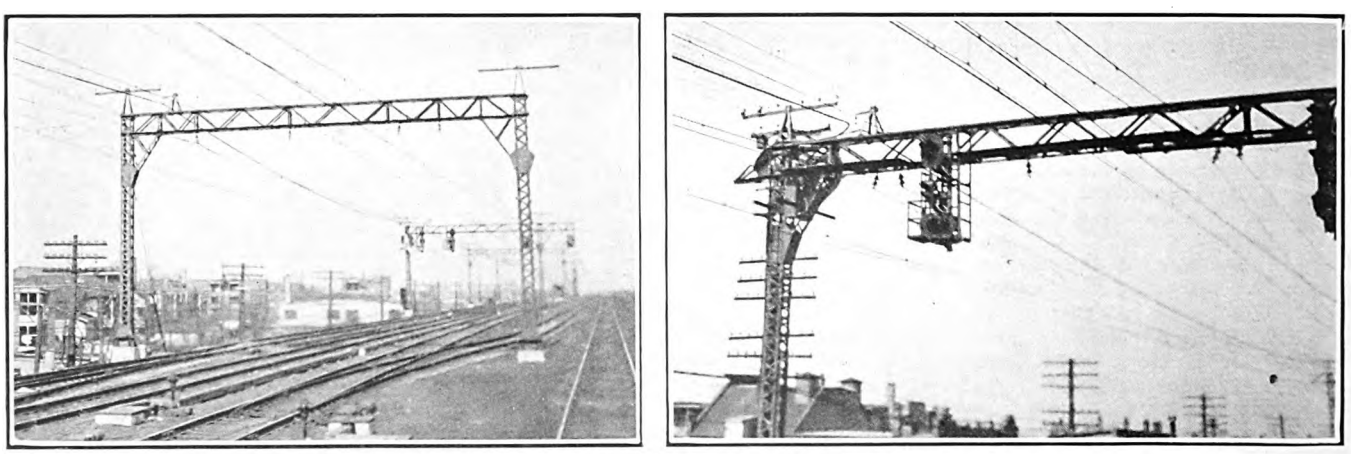
Car and Bus Manufacturers Outline Conditions for Purchasers Made by Deferred Payments—Some Interesting Facts Regarding the Terms of Sale Proposed

INTEREST in the bids submitted to supply 125 street cars and 125 double-deck buses to Detroit for use on the Municipal Railway at a probable cost of more than $3,500,000 for both lots of equipment goes beyond the matter of prices quoted by the various bidders. To other railways much of that interest lies in the terms under which both types of equipment may be purchased on the deferred-payment plan. Weeks ago no secret was made of the fact that the city might desire to resort to financing of this kind, but at the time the bids were opened William M. Hauser, auditor of the system, emphasized the fact that the city did not have "a dime" in the treasury for such purposes.

That, however, did not deter the city from going into the market for additional equipment, due to the fact that both the car and the bus manufacturers themselves are prepared to aid in the financing of the purchase. That is not because it is the city that is making the purchase, but because the manufacturers are willing to co-operate in such matters in the case of responsible operators. Not all the bus manufacturers who quoted prices made it plain that they were prepared to proceed on the deferred-payment plan, but even in the case of those that did not formally do so, the impression was conveyed that such terms could be arranged. In due course the names of the successful bidders for both the cars and the buses will be announced, but just at this time the subject of terms is the consideration which is paramount.

The lowest bus bidder, both for cash and for payments, did not allow for as long a period in which to pay as did one of the other bidders. Another bidder did not offer any financial plan, while still another did not offer an extensive financing plan.

A bid of $13,360, with tires, as a cash proposition and of $13,860, government tax included, on a two-year payment plan was one of the proposals. Under this bid at the end of two years the city would own the buses outright



Stretches of the Illinois Central Which Show the Catenary Suspension

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at an average cost of $14,725.25. This means an additional cost to the city of $866.25. per bus for buying on the payment plan.

Another bidder offered the buses at $14,136, with tires and tax included, and provided for payment over a period of 96 months at monthly payments of $190 per bus. Under this plan the city would have longer to pay for the equipment, and the additional carrying charges would be approximately $3,500. This would make the ultimate cost to the city at the end of eight years, at which time the buses would be owned outright by the D.S.R. about $17,500.

Car Prices Vary Slightly

Car prices, it appears, ranged from a low of $17,425 to a high of $17,792. These are said to be about $4,000 greater than the city paid for similar equipment two years ago, but the difference is attributed to refinements in appointments such as linoleum floors, special upholstered seats, etc. Each bidder was asked to bid on 125 Peter Witts and on cars of the bidder's own design of the same carrying capacity as the Peter Witts, and also to state prices cash and on a seven or ten-year payment plan.

The lowest bidder suggested a seven-year payment plan with 84 monthly payments, at $263.27 a month for each car. Like the other bidders, this company did not include any ten-year payment plan. For a light-weight car of its own design the company offered to build 50 cars at $15,886 a car cash or $235 a month a car over a period of seven years.

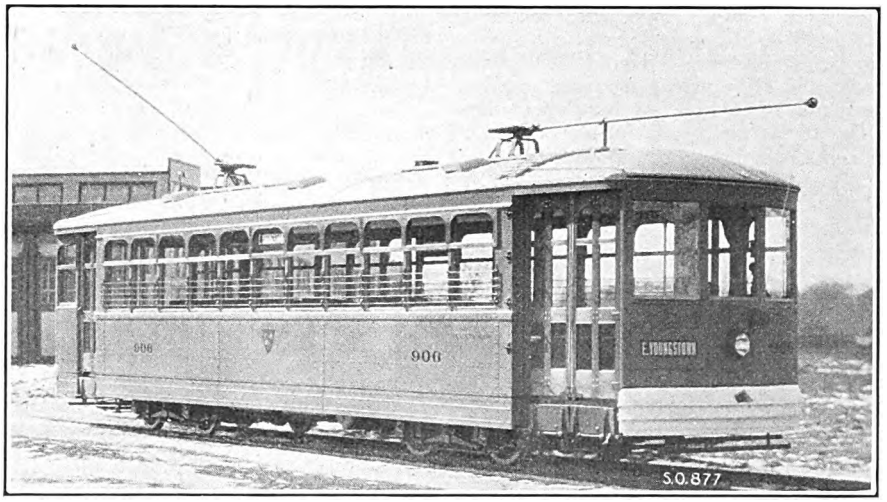
Another company, one that bid on 50 Peter Witts, asked $17,792 a car cash or $263.27 a month a car for 84 months. On 50 cars of its own design it asked $16,350 a car cash or $241.91 a car a month for 84 months. Still another company offered 150 to 300 Peter Witts at $17,500 a piece. For 125 to 300 of its own make it asked $16,000 apiece. On the time-payment plan it asked $258.93 a month a car for Peter Witts, or $263.75 apiece for its own make. From 100 to 300 Peter Witts were offered at $17,500 cash apiece, and 125 of the company's own design at $15,987 cash apiece. On the time payment basis this manufacturer asked $236.42 a car a month for its own make, with an alternative of cars with additional equipment at $259.92 a car a month. For Peter Witts it asked $258.93 a car a month. In the case of another bidder 50 Peter Witts were offered at $17,675 cash apiece or $261.52 a month for eighty-four months. For 50 cars of its own make this company asked $16,266 cash apiece or $240.68 apiece a month over seven years.

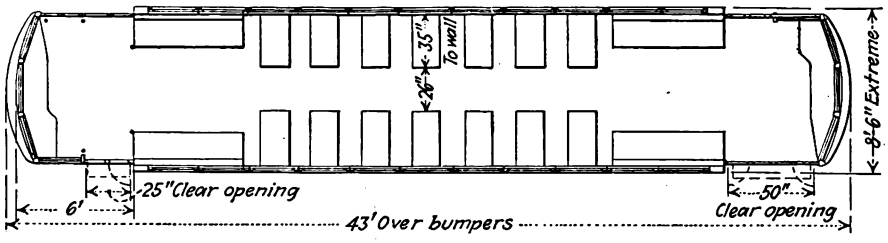
No Bids on Peter Witts by One Builder

There was one manufacturer that did not bid on Peter Witts but offered 125 of its own make at $16,000 apiece cash or $287 a month apiece for seven years. It offered the same car with additional equipment at $16,050 and $17,000 apiece cash, with corresponding increase in the monthly payments. It also offered an alternative time-payment plan with graduated monthly payments, decreasing from $492 to $169 a month.

As has been indicated before, these offers are significant in that they furnish a criterion of the willingness of the makers of both cars and buses to fit their selling plans to the needs of the responsible buyer.

Youngstown Gets Thirteen New Cars





Exterior and Floor Plan of New Youngstown Cars

Delivery has recently been made of thirteen de luxe street cars built by the G. C. Kuhlman Car Company for the Youngstown Municipal Railway, Youngstown, Ohio. They are one-man, two-man double-end safety cars with a seating capacity of 44. Specifications follow:

Weight:	
Car body	16,060 lb.
Trucks	9,280 lb.
Equipment	6,780 lb.
Total	32,120 lb.
Bolster centers, length	20 ft. 4in.
Length over all	43 ft. 0 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. 5 in
Body	Steel frame
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse & General Electric
Bumpers	Channel, 5-in.
Car signal system	Faraday
Center and side bearings	Brill
Compressors	CP 27-B
Control	K35-KK
Destination signs	Hunter
Door operating mechanism	National Pneumatic
Fare boxes	Cleveland
Fenders	Eclipse
Finish	Lacquer
Hand brakes	Brill with Peacock Improved
Heater equipment	Railway Utility
Headlights	Golden Glow
Journal boxes	Brill
Lightning arrester	Westinghouse KK-3
Motors	Westinghouse 508-A, inside hung
Sanders	Nichols-Lintern No. 105
Sash fixtures	Curtain Supply Co.
Seats	Brill
Seating material	Leather
Step treads	Kass
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trucks	Brill 177-E1
Ventilators	Nichols-Lintern
Wheels	26-in.

H. A. Hegeman Succeeds C. C. Castle

Harold A. Hegeman was elected first vice-president and treasurer of the National Railway Appliance Company, New York, N. Y., at a meeting of the board of directors held on April 1. He thus takes the office left vacant by Charles C. Castle when the latter resigned to go with the American Car & Foundry Motors Corporation. B. A. Hegeman continues as president of the company, while W. C. Peters has been named vice-president in charge of engineering and sales.

W. A. Bates Forms New Company

Manufacture of a new design of steel poles, towers, substations and other steel fabrications and specialties will be undertaken about June 1 by the Walter Bates Steel Corporation, just organized by Walter A. Bates, formerly vice-president of the Bates Expanded Steel Truss Company. A fabricating shop and a special department for the manufacture of poles and other specialties are located on East Fifth Avenue, Gary, Ind. There is no association between the Bates Expanded Steel Truss Company and the Walter Bates Steel Corporation.

Wellman-Seaver-Morgan Engines Now Built at Orrville

Purchase of the motor division of the Wellman - Seaver - Morgan Company, Cleveland, Ohio, was consummated on Jan. 1, 1926, by the Sanderson-Cyclone Drill Company, Orrville, Ohio. In the

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agreement covering this purchase, all drawings and patterns, special machinery, tools and jigs, inventory and good will of W-S-M engines were transferred to the Sanderson-Cyclone Drill Company, and all physical property has now been moved to the new factory in Orrville. Practically all former heads of the engineering and manufacturing departments of the motor division of the Wellman-Seaver-Morgan Company have continued with the company under the new production arrangement.

Metal, Coal and Material Prices

Metals—New York	April 6, 1926
Copper, electrolytic, cents per lb	14.00
Copper, wire base, cents per lb	16.25
Lead, cents per lb	8.20
Zinc, cents per lb	7.51
Tin, Straits, cents per lb	63.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	2.00
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.325
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	10.9
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$1.03

Rolling Stock

Georgia Railway & Power Company, Atlanta, Ga., in March ordered 60 double-truck double-end safety cars from the Cincinnati Car Company. These new units are mounted on Brill 177 E-1 trucks and have a seating capacity of 48. Delivery is expected in September, 1926. Specifications follow:

Weight	37,000 lb.
Length over all	46 ft. 4 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	11 ft. 8 in.
Interior trim	Cherry
Headlining	Agasote ¾ in.
Roof	Monitor
Air brakes	Safety car devices
Axles	Cambria hammered steel
Bumpers	Pressed steel
Car trimmings	Bronze oxidized
Compressor	WH DH-16
Control	K-35JJLB4—DB9 and 7A line breaker
Bearings	Stuki side—Brill oil retaining center
Curtain fixtures	Curtain Supply—Rexrollers
Curtain material	Pantasote No. 86 grain morocco
Destination signs	Keystone and L. R.
Door operating mechanism	National pneumatic
Fenders	HB
Gears and pinions	General Electric—tool steel long and short addendum
Hand brakes	Peacock staffless
Heater equipment	Consolidated panel type No. 321
Headlights	One-half Crouse-Hinds, one-half Golden Flow
Journal boxes	Brill 3¾ in. x 7 in.
Lightning arresters	Aluminum cell-three-cell type
Motors	GE 265A-35-HP. quadruple
Paint	Enamel
Registers	Ohmer
Sanders	OB Form 1
Sash fixtures	Dayton No. 300
Seats	Hale & Kilburn AWO 400
Seating material	Cane springless, insert panel
Slack adjuster	American E-1
Springs	Brill
Step treads	Aluminum
Trolley catchers	OB 13141
Trolley base	OB Form 4
Trucks	Brill 177-E-1
Ventilators	Monitor deck sash
Wheels	26 in. diameter
Special devices, etc.	Treadle devices and brake lock

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has purchased five 21-passenger street car type Studebaker buses to be used in extending service into sections not heretofore enjoying regular transportation.

Potomac Edison Company, Cumberland, Md., has ordered two 25-ft. 9-in. closed cars from the J. G. Brill Company, Philadelphia, Pa. The new units will be mounted on Brill 177-El trucks.

Connecticut Company, New Haven, Conn., has placed an order with the Mason Manufacturing Company, Springfield, Mass., for a crane car.

Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, has just placed an order with the G. G. Kuhlman Car Company, Cleveland, Ohio, for eight light-weight interurban cars.

Tennessee Electric Power Company, Chattanooga, Tenn., has appropriated $160,000 for the purchase of ten new street cars and for rebuilding and repairing its present rolling stock during 1926.

Track and Line

North Carolina Public Service Company, Greensboro, N. C., has started the work of hard-surfacing the area between the car tracks on North Elm Street from the old city limits to Irving Park. It is estimated roughly the work will cost about $3,000. The distance is about two-thirds of a mile.

Wilmington & Philadelphia Traction Company, Wilmington, Del., is planning to spend approximately $80,000 in improvements to the streets of the city of New Castle over which the trolley line extends. One carload of 600 ties has arrived and several others are expected within a short time. When the proposed work is completed the rails throughout the city will have been entirely replaced.

Kanawha Traction & Electric Company, Fairmont, W. Va., will apply to the Wood County Court on April 10 for permission to construct an extension of 3,200 ft. in Parkersburg.

Puget Sound Power & Light Company, Seattle, Wash., will spend $4,000,000 for service, extensions and improvements of service in the Olympic Peninsula, an increase in the capacity of the Baker River hydro-electric plant, and construction of a $400,000 interurban and stage station in Seattle are planned.

Tennessee Electric Power Company, Chattanooga, Tenn., expects to spend in excess of $196,000 in rebuilding tracks on the Chattanooga System. The program of rehabilitation includes sections of the Oglethorpe, Rossville, Oak Street, Mission Ridge, North Market and Alton Park Division, as well as the Boice Division, with the proposed viaduct over the tracks of the Southern Railway on East Third Street.

Berkshire Street Railway, Pittsfield, Mass, has been authorized by the Pittsfield Board of Aldermen to install a double track at North and South streets, opposite Park Square and to relocate the crossovers at North and Wahconah streets.

Trade Notes

Uehling Instrument Company, Paterson, N. J., announces the appointment of W. B. McBurney, 619 Trust Company of Georgia Building, Atlanta, Ga., as representative for Georgia and eastern Tennessee, in connection with Apex CO_2 recorders and indicators, fuel waste meters and combined barometer and vacuum recorders.

Irvington Varnish & Insulator Company, Irvington, N. J., announces that in spite of the losses suffered in a recent fire in its plant, little or no delay will be caused in delivery schedules. The fireproof qualities of the plant thoroughly proved themselves during the recent conflagration, as loss to equipment was avoided and with the speedy repair of the electrical and steam connections and the cleaning up of the water the company will be in a position to resume its regular schedule in manufacturing operations.

Waugh Equipment Company, Chicago, Ill., announces the purchase of the Gould Coupler Company's friction draft gear and passenger buffer and platform business. The Waugh company will manufacture and distribute a complete line of Gould high-absorption friction draft gears and in addition will continue to produce its present line of high and low capacity plate spring friction gears and buffers. A. J. Pizzini, president of the Waugh Equipment Company, is also president of the Railway Improvement Company, New York. The Waugh company's devices are extensively used in the heavy electric traction field and on multiple-unit equipment.

Six Wheel Company, Philadelphia, Pa., makers of the Safeway Six-Wheeler, announce that on and after May 1, 1926, balloon tires will be standard equipment on the Safeway Six Wheel Coach. This is the sixth important improvement which the company says it has been the first to adopt.

New Advertising Literature

J. G. Brill Company, Philadelphia, Pa., has issued leaflets No. 300 and 301 covering the Kuhlman intercity and type "K" city coaches. Principal specifications of these two types of buses are given as well as a number of photographs.

Charles Engelhard, Inc., New York, N. Y., has issued a leaflet describing its type S recorder for automatic temperature observations. Instruments ranging in capacity from a single continuous record to six continuous records of various colors are available. A list of standard chart ranges giving calibrations for use with thermocouples, electric thermometers and other recording mediums is included in the leaflet.

Pittsburgh Transformer Company, Pittsburgh, Pa., has issued Bulletin No. 2053, entitled, "Some Advantages of Pittsburgh Polyphase Distribution Transformers." Various data on the operating characteristics of polyphase transformers and comparative cost of polyphase and single-phase transformers are included.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

Volume 67 New York, Saturday, April 17, 1926 *Number* 16

A Forward-Looking Viewpoint on Maintenance

UNQUALIFIED indorsement is registered by many chief executives of the viewpoint expressed in the Annual Maintenance Number of the JOURNAL published on March 20. In the issues of April 3, April 10 and on another page of this number letters are published from executives commending the forward-looking point of view from which the maintenance man's part in selling transportation was presented.

There is cause for deep gratification in all of this. Sometimes there is a feeling among maintenance men that they are somewhat sidetracked in the general discussion of measures for improving the status of the industry. Again, there is some tendency to question the foresight and imagination of those charged with maintenance supervision. It would be imitating the ostrich to deny that there has in a measure been cause for some of this feeling both inside and outside the executive office. But from the point of view expressed in this maintenance number, it is clearly evident that many of those responsible for the upkeep of the physical property are keenly alive to the modern conception of railway service and to the important part which the maintenance man must play. On the other hand, the letters which have come in from executives show that the man in the inner office is enthusiastically ready to recognize and to support such progressiveness.

Here is represented the ideal meeting of minds—the concrete evidence of the new spirit of co-operation and the new *esprit de corps* that is permeating the industry. It speaks well for the future. In years to come, when we look back along the grade up which the industry is now traveling with increased momentum, it is the hope of the JOURNAL'S staff that this issue will stand out as one of the milestones in the march of progress.

On every hand there is growing evidence of this progress. The broadening demand for new and improved equipment, interest in the better maintenance of existing cars, track and power facilities, and a tendency by executives to expand maintenance budget allowances so as to permit the acquirement of better tools and the closer supervision of the condition of equipment are all leading in the same direction—improved service. That, in turn, will help to build public confidence and friendliness. Here lies the source from which come improved franchise conditions, more adequate fares, relief from unfair tax burdens and other fundamental measures required for the adequate development of local transportation. The industry is on a cumulative cycle of improvement. It should be an inspiration for maintenance men to read the views expressed by Messrs. Budd, Coates, Thompson, Draper, Reid, Dana, Wallace, Buffe and Holden relative to the part which maintenance plays in the general scheme. Mr. Storrs said recently that the industry needs to look more to the future and less to the past. Here indeed is evidence of a forward-looking viewpoint.

Quality of Maintenance Work Affects Prestige of Entire Industry

RESPONSIBILITY for the good or bad opinion which the public has of the electric railway rests heavily on the maintenance men. Neglected maintenance of track and rolling stock naturally tends to create an impression of obsolescence. The public has heard it said that the day of the street car has passed. When the average man looks around him and sees neglected track and poorly maintained cars, he is inclined to believe these gloomy forecasts. If the company is not spending any considerable amount of money on the upkeep of equipment, he thinks the reason must be that it is acknowledged to be obsolete.

Impressive figures of the number of passengers carried annually by electric railways presented to show the essential character of the industry convince the public not at all in the face of clear evidence of failure to maintain the physical property. People in one town seldom know anything about electric railway conditions elsewhere. They judge by what they see with their own eyes. One dilapidated car at home does more damage to the prestige of the industry than can be repaired by a hundred new cars in some other city. One neglected piece of special trackwork in the neighborhood outweighs a dozen miles of smooth, quiet track somewhere else.

The work of the maintenance man, therefore, has an effect a good deal more far-reaching than is realized in all cases. Not only is it an important factor in the economical operation of his own property, but the thoroughness of its performance has a vital bearing on the esteem in which electric railways in general are held by the public.

Noise as an Indication of Inefficiency

EXCEPT for warning devices, such as the whistle or gong, noise is not included as a desirable factor in the design of any transportation apparatus. Any noise which is found in the operation of a new system is there of necessity rather than choice. Looking at the source of such noise, in the final analysis it will be found the mark of inefficiency.

Complete elimination of noise, even in new equipment, is practically out of the question, not because it is impossible to build devices that operate with perfection, but because the cost of doing so is prohibitive. It is remarkable, though, how closely this ideal may be attained in commercial designs. The new car or the

This is the issue in April that is devoted essentially to maintenance subjects

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new bus, running on a good track or a smooth highway, operates with so little noise that it is seldom criticism comes on that score.

It is not so easy to keep down the noise as the parts wear and the equipment becomes older. Devices have not been developed that do not wear, and wear itself means looseness, with the inevitable chattering and vibration. Naturally, the longer the parts are allowed to wear without adjustment the greater become the clearances and the more the resultant noise. Here again it is a question not of the impossibility of getting rid of noise more or less completely by restoring parts to their original condition, but of the cost of doing so.

Standards set up by the public with regard to allowable noise have changed greatly in recent years. Assign what cause to this one will, it is a fact that the public will not tolerate noises that once were accepted as a matter of course. The importance of reduction of noise as an asset in merchandising transportation never can be overemphasized. Lack of attention to noise reduction today brands the company as non-progressive and makes it just so much more difficult for the management to maintain relations with the public on a satisfactory basis.

Attention was called in the maintenance issue last month to methods of noise reduction that are applicable in all departments of the railway system. Equipment, track and line all contribute to the production of noise, and in each there is possibility for improvement. In general it may be said that the remedies proposed are easy of adoption, and the expense of reducing noise to the point where most of the criticism will be silenced is not prohibitive. Furthermore, use of such methods inevitably will lead to a reduction in their cost and may even result in lower total maintenance costs for the system.

Planning for Special Devices Will Increase Their Effectiveness

PRACTICALLY every railway system has a number of special machines and other pieces of equipment which have been installed to facilitate the work of maintenance. As a rule, these devices have been added from time to time as the funds of the company permitted. Often they have been placed wherever there was a vacant space in which to put them. This is true particularly in the case of shop equipment. In a shop well planned for production, it is the general practice to arrange the equipment so that from the point where the car is dismantled the work will be routed in progressive order to the point where the parts are assembled again after their repair. In this way the time consumed in handling is reduced to a minimum.

Case after case will be found where at one or more points the progress of the parts under repair will be delayed by inadequacy of the machines, or capacity that will not care for the volume of work to be handled. Such a lack will be reflected in the entire progress of the overhauling. Cars will be held in the shop longer than necessary and the assembling tracks will be crowded on account of this inability to perform a certain operation. This also results in inefficient use of labor in most cases. Workmen will be held idle awaiting the arrival of parts that are vital to the assembly. The offending department will be subjected to abuse, but unless a readjustment can be made there is no remedy for the condition.

Sometimes a study of the shop layout will show that it is possible to make changes that will permit a great deal more work to be turned out by certain parts of the shop equipment, thus removing the limitation. For instance, the difficulty may be that the equipment is not properly placed, so that there is delay in getting the parts delivered or taken away, allowing the product to choke itself. In one case, that of three baking ovens, it was found that the method of storing armatures in the ovens themselves was inefficient, and the methods of handling the armatures resulted in interference. With relatively minor expenditures the capacity of these ovens was increased 62 per cent.

The illustration cited is only one of many, although the increase in capacity was striking. Study given to the particular problem in any shop will undoubtedly bring to light instances where improvements can be made that will not only make the work easier, but will remove limitations that seriously hamper the quick repair of equipment.

Successful Executives of the Future Will Come from Engineering Professions

DEVELOPMENT of engineering as a factor affecting the management of business and industry has now progressed to a point where a majority of the important decisions probably are controlled by technical considerations. While other factors enter into these decisions, in many cases engineering has become the most influential. This was emphasized at a recent joint meeting of the four major engineering societies, when the discussion centered on the subject of qualifying the engineers for executive positions.

Since no one individual can be expected to be thoroughly familiar with all the various factors—legal, financial, technical and others—which must be considered in the determination of matters of business policy, he must rely to some extent on the advice of others. But the executive should have intimate personal knowledge and experience along at least one of these lines, and preferably that most important in his business. In industries where engineering considerations predominate, therefore, it may reasonably be expected that a majority of the successful executives of the future will be drawn from the ranks of those who have had engineering training.

Advantages likely to result from the selection of engineers for executive positions will be more readily appreciated in the light of the qualifications which the speakers at this meeting said a good engineer should possess. He should, without question, understand the fundamentals of his profession. Beyond that his outlook should be broad rather than highly technical. His course of study in college should include cultural subjects as well as purely scientific subjects. This was the unanimous opinion of men of such diversified interests as E. M. Herr of the Westinghouse Electric & Manufacturing Company; A. H. Guess of the American Smelting & Refining Company; Dr. F. B. Jewett of the American Telephone & Telegraph Company, and J. C. Parker of the Brooklyn Edison Company.

By the definition given by these prominent industrial leaders, a good engineer is far more than a mere tech-

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nician. In fact, too much enthusiasm for technique was mentioned as a real obstacle in the way of success in engineering. Sound knowledge of the fundamentals of engineering, a broad outlook and just appreciation of relative values, and last but not least, an understanding of the human side of industry—these are the qualification of the good engineer. Thus equipped, he is well fitted for an executive position. Nowhere does this hold true more than in the electric railway field.

Modern Machine Tools and Shop Facilities Needed

QUALITY in repair work depends quite as much on the tools used as on the workmen themselves. It is manifestly unfair to expect workmen to take large cuts at high rates of speed on machine tools which have small capacity. The advent of high-speed steel has forced the designers of machine tools to provide increased capacity and increased production. Manifestly, old equipment cannot be made to perform with the same efficiency as these modern machines. Careful selection of small tools is also necessary, in order to obtain the degree of efficiency which modern shop equipment demands.

On most electric railways, funds available for betterments are limited and must be stretched to cover needed facilities in many departments. Many times, when the merits of a machine are recognized, it is felt that the interests of the railway and the public will best be served by the expenditure of available funds on facilities where the need is more urgent or which will create immediately a greater return.

It is time that railway officials realized that attractive, reliable rolling stock requires a first-class shop for proper maintenance and that the resulting reduced repair cost will help pay for any improvements made. Machine work should be substituted for hand work wherever possible. Proper routing of work to eliminate lost motion and speed repairs can usually be obtained by careful study of conditions and with little added expense. Carefully compiled cost records and an exchange of ideas and information with neighboring properties will enable officials to tell when costs are abnormal and to apply a satisfactory remedy.

Trackwork Has an Equal Right to a Place in the Sun

CLOTHES may make the man, but flat feet will make him thoroughly miserable. What more pathetic sight could be conceived than that of a nice shiny new street car leaping and bucking down a stretch of track that would bring tears to the eyes of an army tank driver? One hears on every side the chorus of pleas for modern, light-weight cars, neater uniforms for platform men, improved public relations—in short, for all of the factors which will make for success in the marketing of transportation. Yet, in fact as in word, the very basis for street car transportation is found in the trackwork and roadbed. It avails little to plan a great skyscraper if the foundations cannot be laid upon solid bedrock. It is equally futile to boast of improved service, riding comfort and modern transportation when the trackwork is in a chronic state of disrepair.

Very natural is the tendency, where funds are limited, to make expenditures in directions which will have the greatest effect in stimulating public good will. Up-to-the-minute rolling stock has an advertising value which cannot be overlooked. Perhaps Tom, Dick and Harry do not wholly appreciate the magnitude of the task involved in keeping trackwork up to par. They are not slow, however, to detect negligence in these matters on the part of the railways.

Smoothness and quietness of operation are factors which are usually judged in a negative way. Their absence is quickly noted and will generate a feeling of antipathy against the railway; conversely, their presence is taken for granted and not often remarked. But this negative reasoning is none the less important. It has been said that one knocker will accomplish more harm than eight boosters can overcome.

Too great emphasis cannot be placed on modernized rolling stock, whose influence is entirely positive. While the influence of proper track maintenance may not register so positively on the car rider or citizen, it is just as essential, particularly on account of its effect in keeping car equipment in good or bad condition. Too little attention to track maintenance and repair cannot be branded as other than a fallacious policy.

Cost Records Should Guide as Well as Check

MAINTENANCE cost records have a twofold purpose to accomplish. The first of these has been generally recognized. They afford the management an indispensable means of checking the performance of various departments. At the same time they act as a powerful incentive to the elimination of waste and inefficiency.

There is, however, an even more important object in the compilation of maintenance costs. They may be made to serve not only as a record of what has been done in the past, but as a valuable guide in future operations. When compiled with this object in view, they become an active part of the maintenance executive's equipment.

General accounts must be broken down to show a comparison for various classes of physical property. In this way only can guesswork be eliminated from the selection of equipment or the determination of types of construction to be used. The character of information which is needed in each department should be the primary objective in laying out accounting subdivisions. Unless each division gives information which is of direct value in determining future action, the expense and complication in records are not justified.

In no department is this more important than in the case of shops and equipment. Lack of proper records is responsible for the tendency to overhaul and repair long after the economical life of equipment has been exceeded. A comparison of the costs on each group of cars would quickly show the fallacy in this practice. The cost of maintaining various types of motors, trucks and air compressors also serves as a valuable guide in determining replacement programs. At the same time such records give the maintenance man accurate information for comparing the performance of apparatus offered by various manufacturers. On this basis cost accounting becomes an active guide in the operation of a property.

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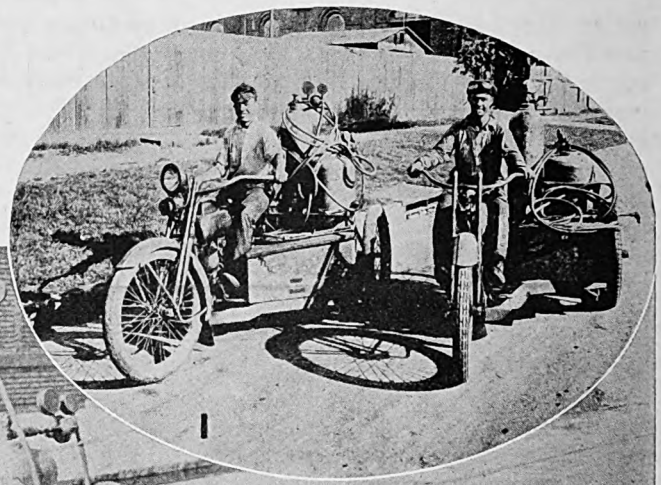
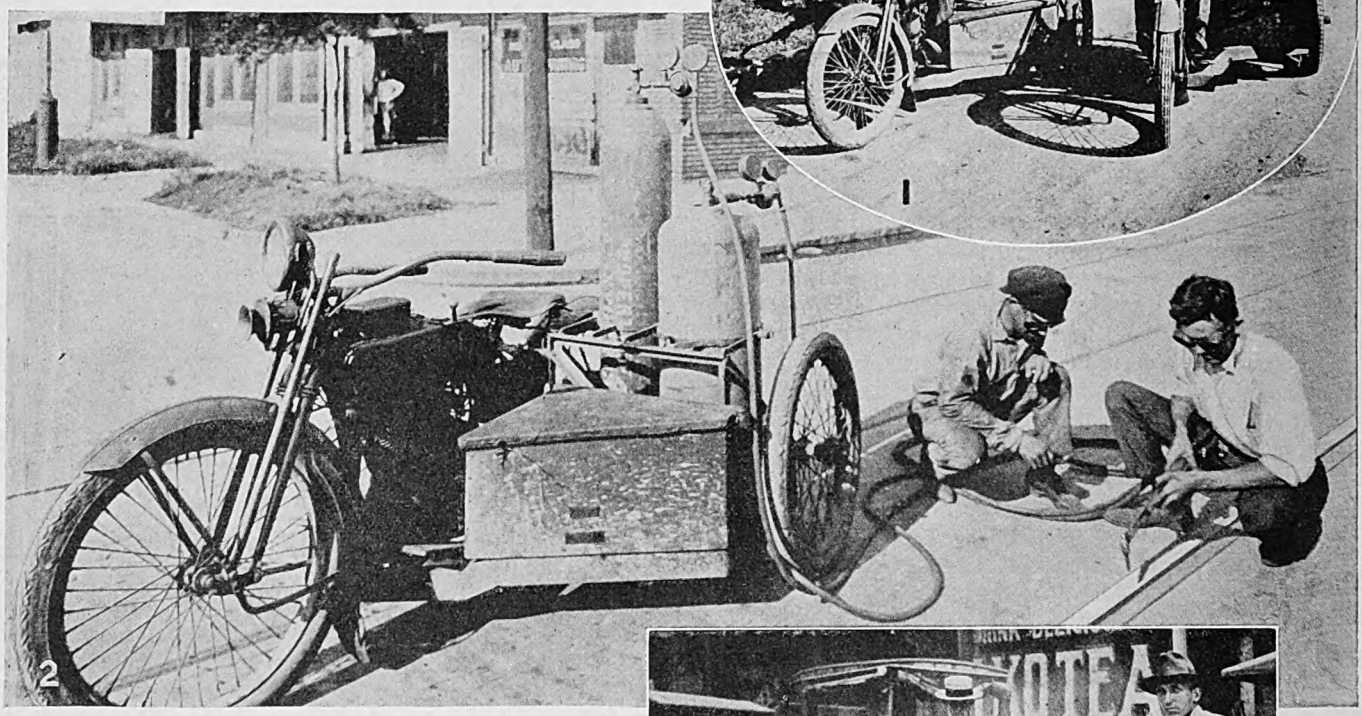
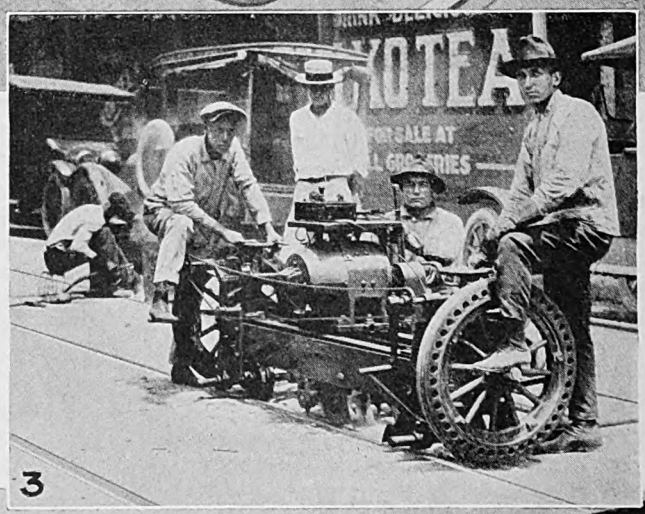
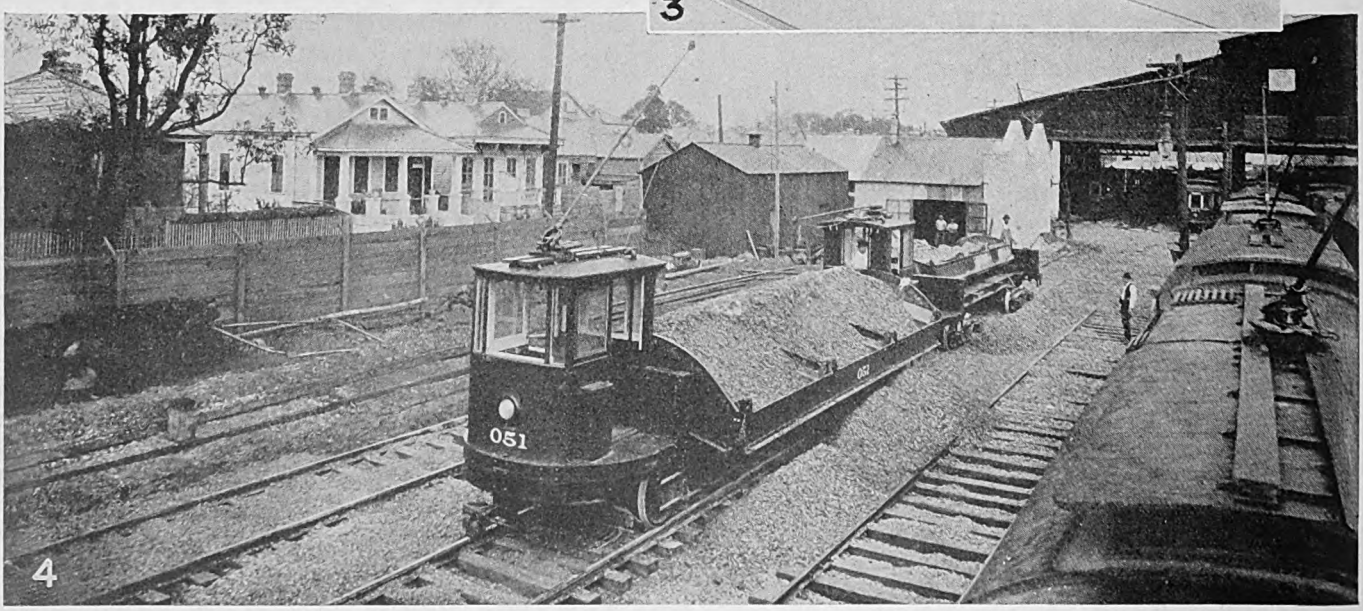
New Orleans Is an Extensive User of Labor-Saving Equipment in Track Construction and Maintenance







1. Motorcycle acetylene cutting outfit.
2. At work with the acetylene torch.
3. Atlas track grinder.
4. This Differential side dumping train has a capacity of 40 cu.yd.



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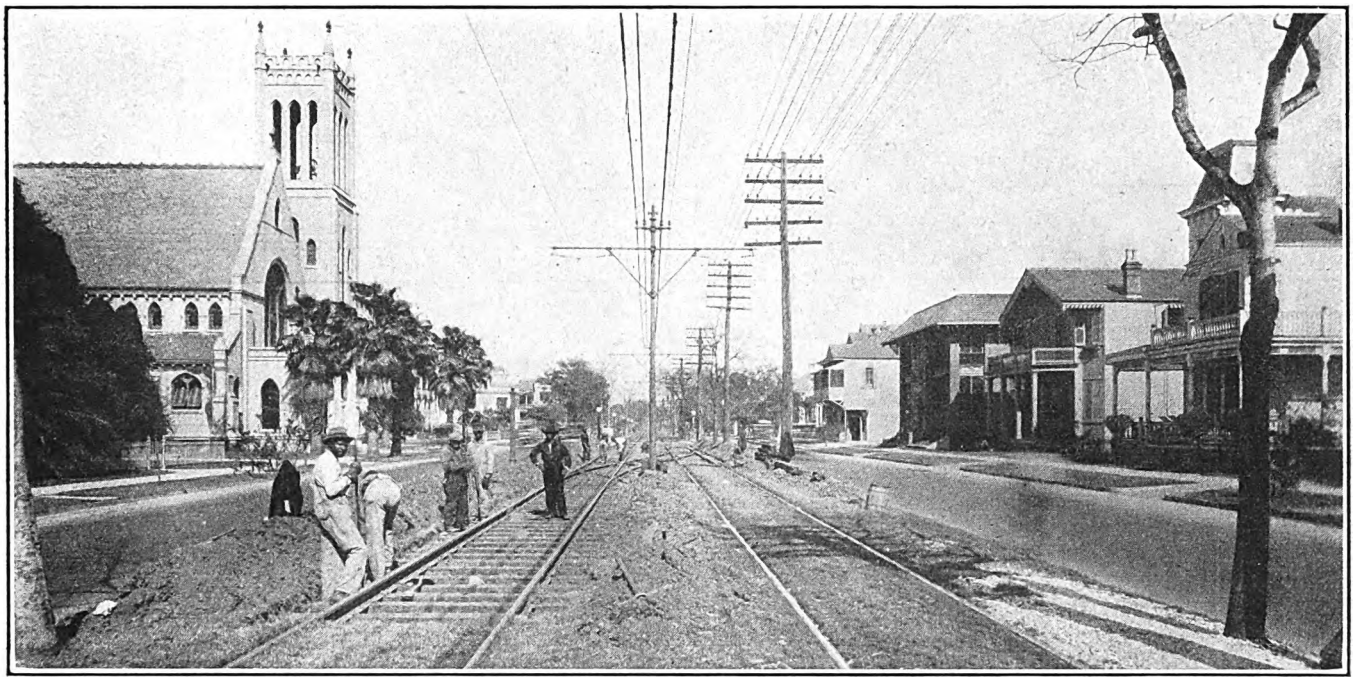


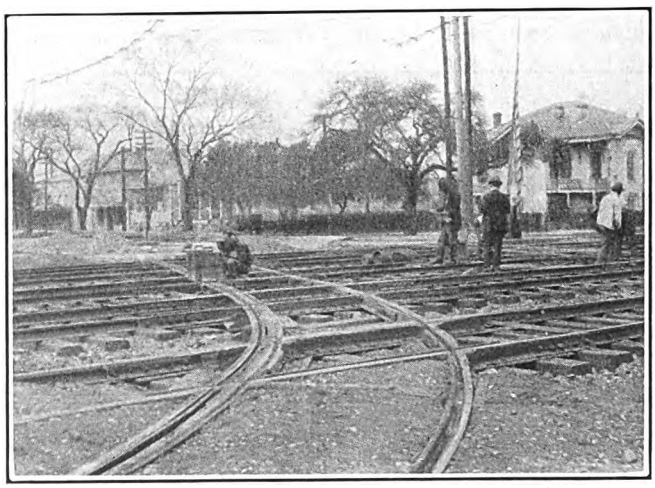
Gang Working on Track in Neutral Ground, New Orleans

New Orleans an Extensive User of Track Machinery

Much of This Equipment Is Mounted on Storage Battery Trucks — The Company Has Done a Great Deal in Developing Methods for Track Rehabilitation by Electric Welding—Special Treatment Has Been Necessitated by Unusual Soil and Ground Water Conditions Existing in the City

ESPECIAL attention has always been given to track construction and maintenance in New Orleans because of the soil conditions. The level of the greater part of the city is below that of the Mississippi River, which is kept from overflowing its banks by levees. In consequence the soil is always moist.

Prior to the installation of subsurface drainage in the city, it was necessary, on account of this moist condition and weak bearing power of the soil, to support the track structure on 1-in. x 12-in. pecky cypress planking. The ballast consisted of either cinders, gravel or shell, the latter predominating. Since the drainage system has lowered the water table several feet, it has been found that a considerable amount of churning takes place beneath the planks whenever water enters the roadbed, and this churning develops void spaces beneath the planks. Consequently, where this occurs, there is a tendency of the track to settle irregularly and require considerable maintenance to keep it in surface. Wherever it has been necessary to rebuild tracks on unpaved streets, the policy of the company has been to remove the entire track structure, including the planking, rolling the subgrade and constructing a new track on 8 in. of slag ballast, using creosoted ties and 7-in. L-491 grooved rail.



In Several Steam Railroad Crossings Recently Laid the Rails Are Seam-Welded to a Base Plate. The Angle Plates Are Also Seam-Welded

In paved street the former method of constructing the tracks was to embed the ties in concrete to a point 1 in. below the top of the tie and then lay a second slab thereon as a paving base. This method provided for the removal of only the top slab when replacement of rails became necessary. This type of construction has been abandoned because it was found that the ties became cut at the rail seat, resulting in a "working" track. The practice now is to pour a monolithic slab, entirely embedding the ties and a part of the 7-in. rail in the concrete.

On neutral ground, of which there is a great deal

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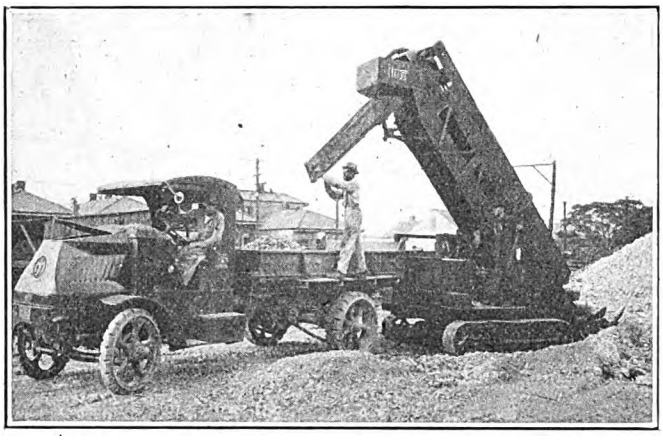
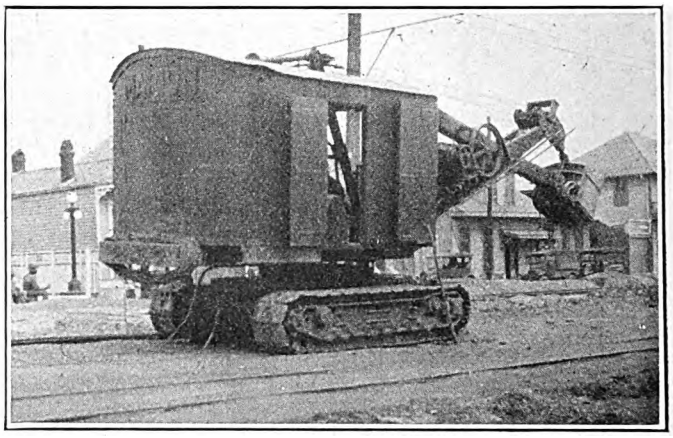




At Left, Haiss Loader Loading Slag Into Truck. At Right, Marion Electric Shovel Mounted on a Caterpillar Truck. When Transported Long Distances It Is Put on a 30-Ton Trail Truck

in New Orleans, the track structure consists of 8 in. of slag ballast, creosoted wood ties and tee rails. Owing to the comparatively weak soil, the ballast is supported on a concrete slab at all of the paved intersections. It is also the policy to fasten a guard rail to the tee rail at the intersections to act as a paving guard.

All Special Trackwork Flange Bearing

All new special work that has been installed recently is of the flange-bearing type. It is believed that this type of special work will reduce maintenance and equipment costs as well as reduce noises resulting from the cars pounding over non-flange-bearing special work.

Most of the old crossings have been made flange bearing by electric welding. The general practice was to build the groove up with successive layers of carbon steel and then to top the carbon steel with manganese steel properly quenched. Lately a chrome steel rod has been used for this purpose, as it has been found more ductile and able to withstand wear better. After being welded the groove is ground smooth with a rotary grinder.

The company maintains a metallurgical laboratory devoted largely to the study of welding problems. It is to the credit of the laboratory work that successful methods of welding have been applied to trackwork. Both hard center and solid manganese special work have been successfully welded and repaired. A large amount of hard center work has been reclaimed by welding base plates to broken castings and by building up the worn centers.

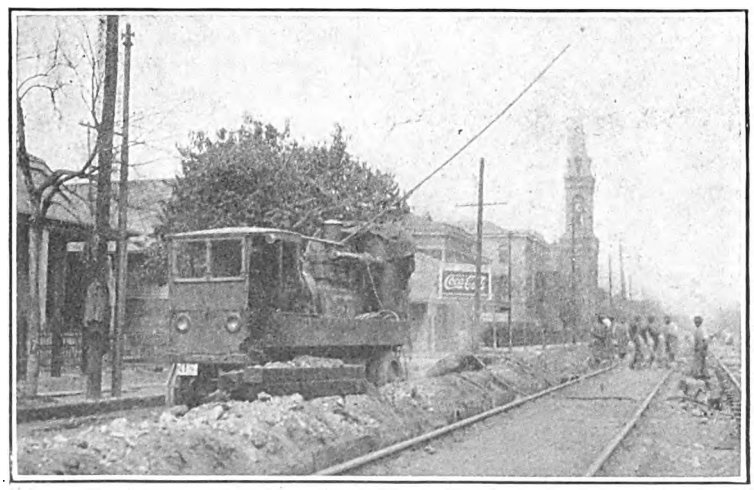
Several steam line crossings have been built by the company recently. These crossings differ from the usual bolted crossing in that the fillers are welded to the rails and all the rails are welded to a base plate. The angle plates are also welded. Several of these crossings have been installed and are giving very satisfactory service.

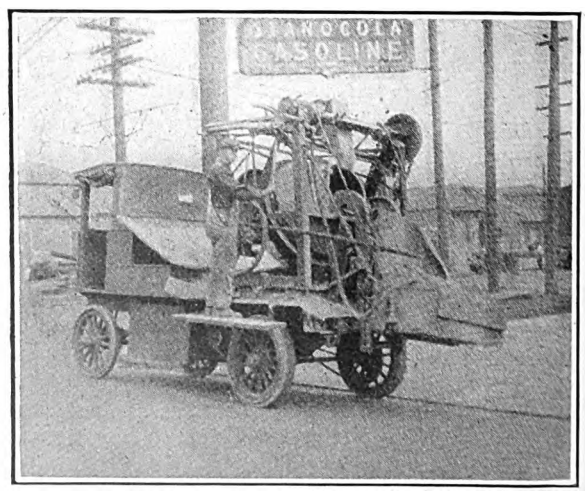
Electric Welding Equipment

Besides its application to special trackwork rehabilitation, electric welding is used extensively in New Orleans for seam-welding rail joints, seam-welding base plates to the rails, etc., in addition to its uses in the track and car equipment shops. Hence, the company has an extensive track welding, cutting and grinding outfit, including:

Eight type WW RWB dynamotors.
One type B RWB dynamotor.
One G. E. motor-generator set.
One Wilson O-B bonding dynamotor.
Three oxyacetylene cutting outfits.
Two Universal rotary grinders.
One reciprocating grinder.
One small portable electric hand grinder.
One large self-propelled Goldschmidt grinder.

Further particulars of this and the other equipment described in this article and their uses were given in a paper by E. S. Myers, superintendent of roadway New Orleans Public Service, Inc., presented at the 1925 annual meeting of the Southwestern Public Service Association and published in the ELECTRIC RAILWAY JOURNAL for May 16, 1925. It is sufficient here to say that four of the type WW RWB dynamotors are each mounted on a Graham Brothers truck, one on an electric





At Left, Portable Air Compressors Mounted on Storage Battery Trucks. At Right, Concrete Mixer on Storage Battery Truck

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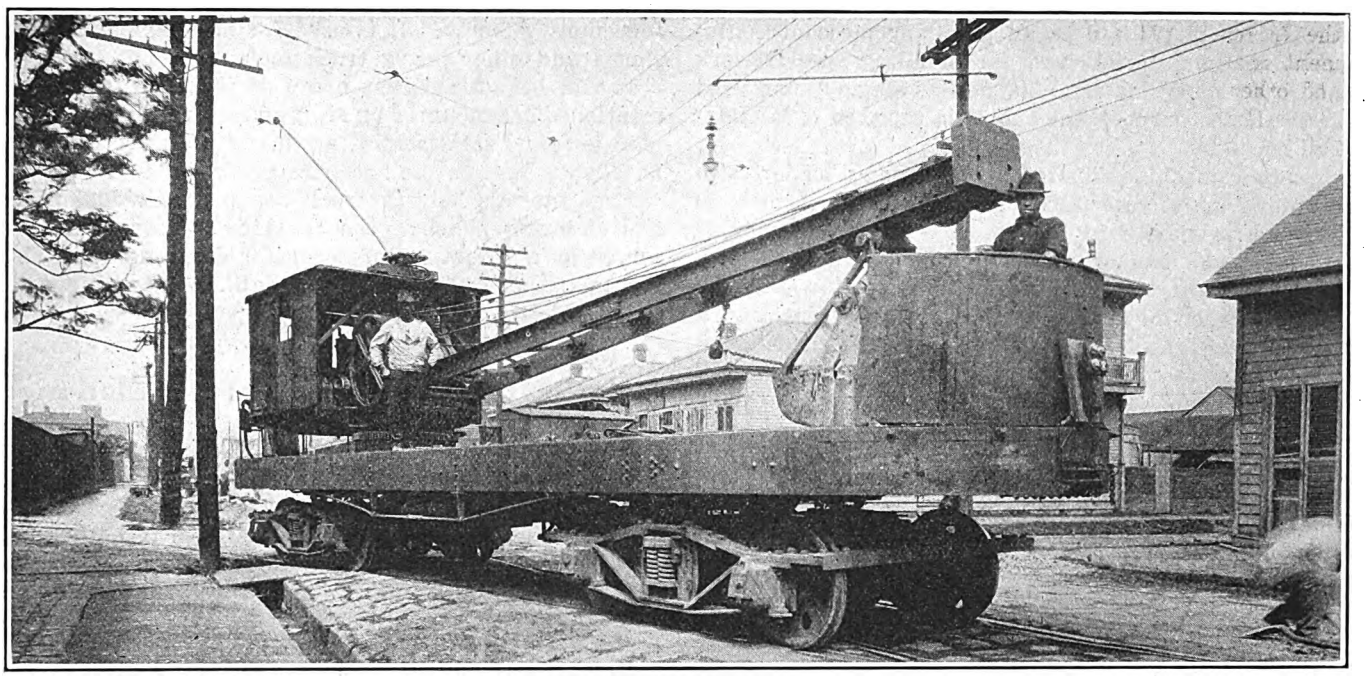


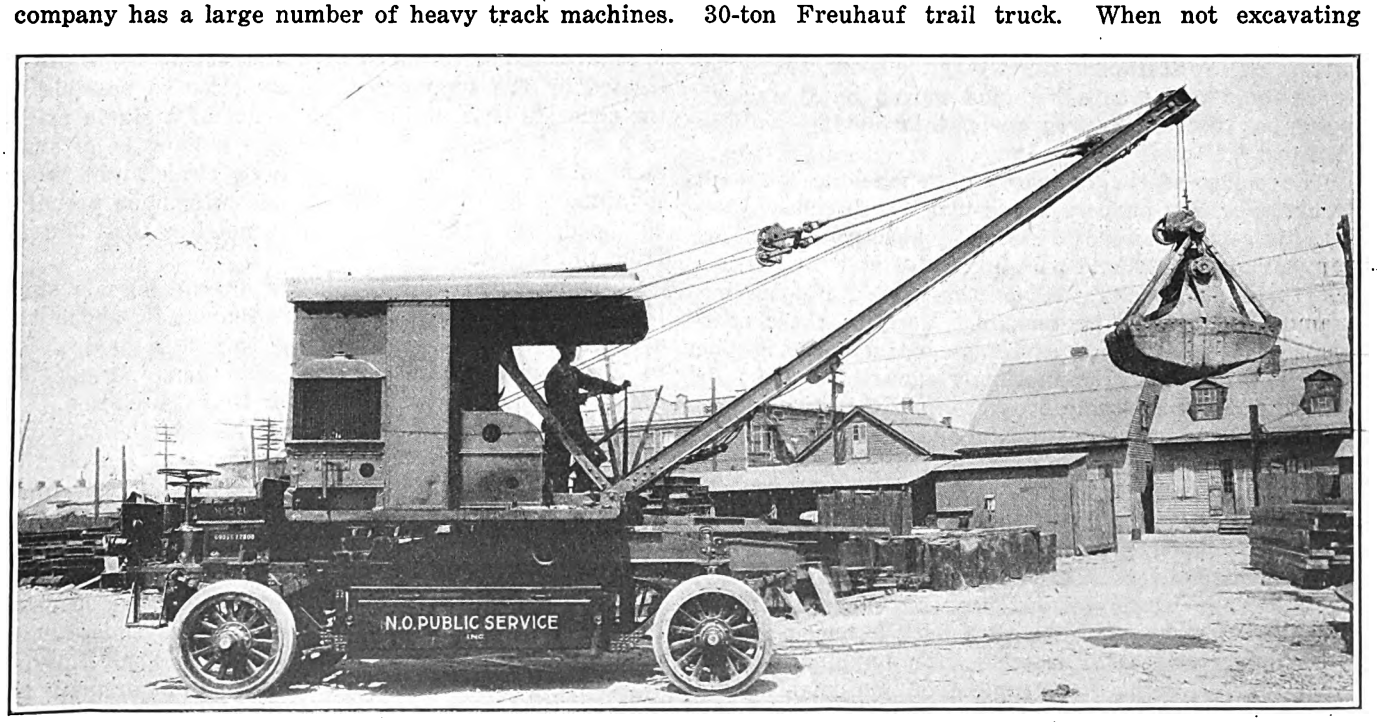
Brownhoist with Boom Down. This Hoist Is Permanently Mounted on the Flat Car Shown

and three of them on 1-ton Ford trucks. Each truck has a specially designed body to carry the welding machine and all the supplies and equipment. The O-B Wilson bonding machine is also used as an emergency welding outfit. The G. E. motor-generator set, the type B RWB dynamotor, the three cutting outfits, the small portable electric hand grinder and the Goldschmidt grinder are part of the welding shop outfit.

Views are shown of one of the three oxyacetylene motorcycle outfits for general cutting. The tanks are mounted on a specially designed side car, which in turn is welded to the motorcycle, comprising a compact outfit. These machines are equipped with 100 ft. of hose, each torch having a complete set of cutting and burning tips so that it can cut rails and bolts and burn holes as desired.

Besides the small equipment shown on page 664, the company has a large number of heavy track machines. Most of these are illustrated in the accompanying views. One shows a Differential dump train consisting of a motor car and trailer. The company had four of these trains, each train having a capacity of 40 cu.yd. Three of these trains are side dumping and the fourth is center dumping. In the paper by Mr. Myers at the 1925 Southwestern convention, already mentioned, the estimate was given that these trains saved the company in handling material in 1924 more than $19,000 over the cost with the usual flat car train. This cost was based on a charge for labor for unloading the flat car of 30 cents per hour, certainly a conservative figure for other cities.

A Marion electric shovel, mounted on a caterpillar tractor, is used for excavating. This machine operates for an average of 3 cents per cubic yard. The machine weighs 60,000 lb. and is transported about the city on a 30-ton Freuhauf trail truck. When not excavating



Universal Crane with Bucket Attached. This Crane Is Also Used Extensively in Handling Special Work

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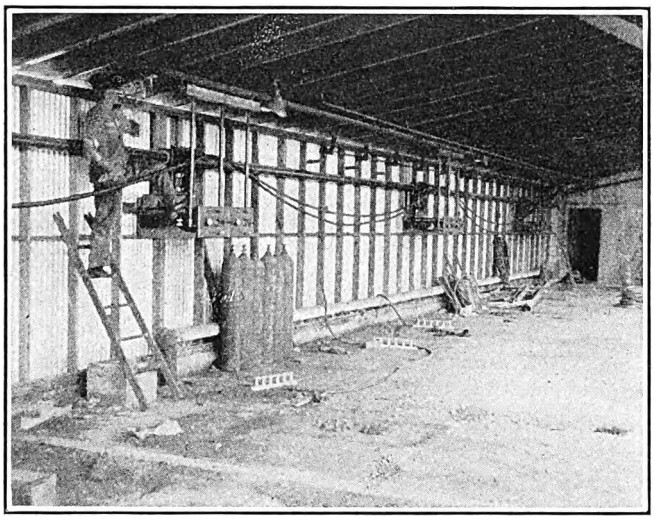
the Marion is utilized as an auxiliary piece of equipment in the material yard for handling special work and other heavy material, as well as slag. When used for the latter purpose, the shovel is replaced by a clam-shell bucket.

Another machine illustrated is a Haiss loader, also mounted on a caterpillar tractor. This loader is designed primarily to handle loose material such as crushed rock, slag or gravel. It has been used very successfully in track reconstruction work where the ballast is shell or dry loose dirt. When trenching, a specially designed Barber-Green conveyor is hitched to the Haiss for the purpose of depositing the material on the the side of the trench, or in the case where double track exists for loading directly on to Differential work trains. The Haiss cuts a trench 9 ft. wide.

The track department also has five portable concrete mixers. One mounted on a storage battery truck is



The Number of Storage Battery Service Trucks Has Been Increased so Greatly that a Charging Shed Is Now Being Built for Them

illustrated. The four others are on caterpillar tractors. Like the Marion shovel, they can be taken from one point to another on the trailer. These concrete mixers can be stationed directly at the point where the concrete is to be deposited and moved by their own power as the work progresses, thus saving hauling charges.

The policy of the company is to machine tamp all track. For this purpose it has two Westinghouse electric air compressors of 250 cu.ft. capacity and one of 110 cu.ft. capacity and one Ingersoll-Rand compressor of 110 cu.ft. capacity. All of these are for operating tampers and concrete breakers. Each of these compressors is mounted on a storage battery truck. The 110-cu.ft. compressors can supply enough air for four tampers or two concrete breakers, and the larger compressors for a proportionately larger number of machines. Power for operating the compressors is taken from the trolley wire.

Other track equipment found useful includes one large Brownhoist, permanently mounted on a motor flat car, and one Universal crane of 2½ ton capacity mounted on a storage battery truck. In the view this latter crane is shown equipped with a bucket, but it is also used extensively with a tackle for handling special trackwork. Another heavy piece of equipment found useful is a Walter tractor with four-wheel drive, weighing empty 8,800 lb. It is used for hauling the Marion shovel and other heavy track tools.

It will be noticed that many of the track machines mentioned are mounted on storage battery trucks. This plan is found satisfactory, as the city is level and care is taken to charge the batteries properly.

Each storage battery truck has its individual place and charging panel at the charging station, which is served by a 75-kw. motor-generator charging set. The trucks are generally charged at night. A view is shown of the charging station being equipped.

Rules for Crossing Signal Installation in New York

RULES and regulations to govern future installation of horizontal flashing light signals at railroad grade crossings in New York State have recently been issued by the Public Service Commission. Some time ago the commission fixed the flashing signal as the standard grade crossing warning for this state, decreeing that whenever any new signal was installed or any existing signal changed this type should be used. The order fixing the signal as standard left for the future the determining of the regulations for the use of these signals.

It is provided that the lights may be installed either in the center of the highway or to the right thereof as one approaches the railroad. One signal must be placed on each side of the crossing. Where the signal is installed in the center of the highway the pole supporting the signal must be embedded in a block of concrete not less than 2 ft. high and 5 ft. wide at the widest point. In the case of installation in the center of the highway the concrete base must be painted in checkerboard fashion, with black and white. The roadway must be increased so that there shall be a clear width outside the concrete block on each side of not less than 12 ft. The widening of the roadway shall be diminished gradually away from the railroad so that the normal width of the pavement shall be reached at a point not less than 75 ft. from the signal.

Each signal installed in the center of the highway is required to be equipped with a reflecting white prism located on the supporting pole as close as possible to the concrete base. This may consist of a single prism or a set of prisms. When installed it must be of sufficient size to be clearly seen on a clear night when illuminated by the headlight of an automobile properly equipped, when the automobile is not less than 300 ft. from the signal.

It is provided that the lamps on the signals shall be not less than 6 ft. nor more than 9 ft. above the surface of the highway, in order to give a good vision to a driver. Where physical conditions permit the order recommends that the lower limit be chosen.

When the signals are placed at the side the supporting poles must be located within 15 ft. of the outside rails of the tracks, and not nearer than 6 ft. nor more than 10 ft. from the nearest edge of the pavement of the highway, unless local conditions, such as in city streets, require a different location.

It is provided that all lamps shall be hooded, so as to render them as visible as possible in the daytime. Each lamp when operated at normal voltage shall have a range on a clear day, with a bright sun at or near the zenith, of not less than 300 ft.

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What Type Cars Does the Public Want?

Mechanical Details Have Been Influenced Too Much by Cost, Weight, Paint and Precedent—Merchandising of Rides Requires Speed, Comfort and Pleasing Appearance

By H. S. Williams
Assistant Superintendent of Equipment
Department of Street Railways, Detroit, Mich.

ONLY a short while ago a paper was read before the Society of Automotive Engineers that carried an important message for electric railway equipment men. It was the story of the design and building of a bus, and thus an engineering problem. An engineer directed the work, but the noteworthy feature of it was that he made his engineering subservient to the greater idea of, "What does the public want?" Observers were sent throughout the country to study public needs, and an analysis of their reports formed the basis of the design. The engineering details then followed this outline. The logic of this method of procedure is too apparent to require elaboration and can well be imitated by electric railway men. In the past too much consideration has been given by those charged with car construction to purely mechanical details—and these details have been influenced too greatly by the factors of cost, weight, kind of paint, precedent, etc., whereas they should have determined first what elements would help merchandise the service and then fit the details about those elements. The most important thing for the engineer to know is what the public desires and is willing to pay for.

Perhaps it is not entirely the fault of the equipment men that they have not always met this requirement. It is possible that the managements have not given them the leeway required, for the average equipment man is of the retiring, modest type and is not sufficiently self-assertive. Be this as it may, the equipment man should be able to look at car design, construction and maintenance from the broadest possible viewpoint and build his plans first on service, comfort, appearance and quiet operation. In support of this view the following is quoted from a recent address of President W. J. Harvie of the New York Electric Railway Association: "Present-day conditions make it necessary for us to take stock of ourselves and our industry and, having in mind the fundamental needs, adapt our equipment and methods to present-day ideas of good service."

Speed, Comfort and Appearance Essential

What, then, are the elements on which the mechanical men must depend to do their share of merchandising? In the order of their importance, these consist of speed, comfort and appearance. It is well-nigh universally conceded that speed is the most important feature in passenger transportation, assuming, of course, that no undue risks are run and no unusual discomforts are imposed. It might be argued that this would not apply in localities where there is no competition, but today "there ain't no sech animal." The private auto competes everywhere. What is the one feature that has allowed the jitney to live? Speed. Being small units, carrying not more than six passengers, they make very few stops and so can make a much higher schedule speed than the trolleys. An experience is recalled of one trolley line operating in competition with a bus service where the street car suffered loss of traffic which was traced to the better speed of the bus. The car line was thereupon placed on a faster schedule than the bus, with the almost immediate result of regaining its lost riders.

Better Acceleration and Braking Needed

To achieve the desired speed in car operation more must be done than to provide sufficient capacity in motors and proper gear ratios. Acceleration is of utmost importance, especially in city transportation, where stops are frequent and limit the ability to make speed. The acceleration should be at the highest rate consistent with comfort, but it must be steady and free from jerks or changes in rate. Moreover, the free running speed should be attained as quickly as possible.

Operation of brakes is a corollary to acceleration and the same general reasoning is applicable. The rate of retardation should be as great as possible. On practically all cars this rate is limited by the possibility of skidding car wheels. It is possible, however, to add magnetic brakes to the air brakes and decrease the time of making the stop by approximately 25 per cent. This may at first seem radical and the objection may be visualized of passenger discomfort, but this has been proved not valid if the end of the stop is eased to prevent the jerk.

It is well at this point to call attention to the necessity of perfecting all the mechanism involved in the stopping of a car to such an extent as to eliminate what, for lack of a better term, may be called backlash. This may involve not only the brake rigging but truck bolster play, tilting of truck springs, etc.

While primarily the items outlined above affecting car speed are the problems of the equipment men, their duty ends with the selection of the proper apparatus and giving correct instruction as to its use; the finishing of the job—and it is by no means the easier or less important part—falls upon the operating officials. For if the mechanism is not handled as it should be, if passengers are thrown from their feet in starting and their necks cracked in stopping, all the advantage of added speed is turned to serious disadvantage.

Passing to the question of comfort and convenience, a large field is open for discussion and few reliable data are available. Here personal judgment must govern largely and the various available schemes weighed with their relation to the property under consideration. It is safe to assume that agreement may be had on the general proposition that the more comfortable the car

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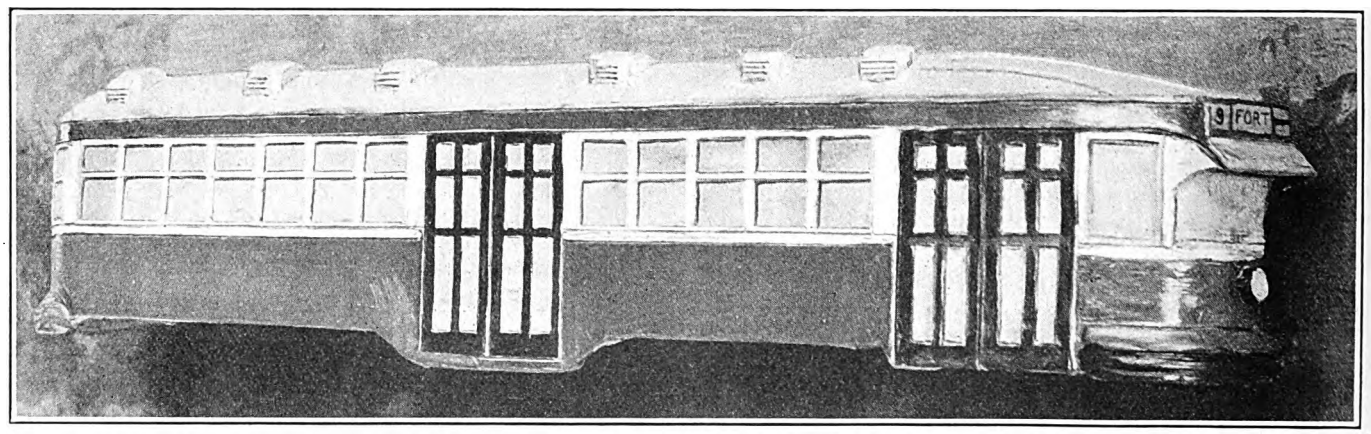
the greater will be the number of riders attracted to it. Let us then determine the various factors which go to make up this feature and look into their possibilities. Without attempting to arrange them in order of importance these factors include quietness, easy riding seats, good heating and ventilating, smooth-riding qualities, low steps and adequate destination signs.

During the past two years the value of quiet car operation has occupied a prominent position in the minds of railway executives. It is admittedly desirable to eliminate noise, not only on account of its effect on the car riders, but also because of its annoyance to residents adjacent to car lines. In this age of rubberized transportation, automobiles have taught people the possibilities of quiet operation. Anything that outrages their sense of hearing is bound to meet with opposition, and opposition of that character will never help merchandise car rides. There is a deep-seated idea in the popular mind that electric street cars are obsolete. The psychology of this is not hard to understand. It is merely that a new style has arrived and new styles are always popular, whether practical or not. That



As a Means of Visualizing a Proposed Design a Model in Clay Such as This Is Helpful

makes it all the more difficult to sell the older idea, imposing upon those in authority a task worthy of all their skill. Can the railway manager allow noisy cars to operate and expect people, for the privilege of riding in them, to give up their private autos? No, indeed! Quiet cars are possible and in the next few years they will have to be produced. As compared with an automobile the street car is under a severe initial handicap with respect to noise by having to run on steel wheels instead of rubber. Even so, are the automobile manufacturers satisfied with the quiet operation of their cars? They are not, and they are spending immense sums on research work which will point the way to still quieter running. If they, being past-masters in the art of selling, are so determined to eliminate noise, why should not we in the railway transportation field take the cue from them and do our utmost to decrease our sales resistance by noise reduction? But this decision must come from the management. When it does the mechanical men can be relied upon to do their part.

When we have quieted all the disturbing car noises and satisfied the passenger on that score, let us look into the question of car seats. There are many angles to this question, not all of them figurative. The more comfortable the car seat, the more desirable becomes the ride in it. But just what constitutes a comfortable seat is not so easily determined. For instance, a soft plush seat may be comfortable in the winter, but with the thermometer ranging around 100 deg. the plush seat, particularly if it be colored red, is not inviting. A well-known instance is recalled where a vote of passengers indicated an overwhelming preference for the hard slat seat. So locality has its influence. Just what type is preferred can be determined only by a careful survey of local conditions. It is safe to say, however, that a well-upholstered, springy cushion and back will prove very popular in most localities, and thus will attract additional patronage.

Seat height has apparently received but little consideration. It is the only dimension on a street car that has ever attained the dignity of becoming a fixed standard, and at that it is wrong if comfort is wanted. A large share of the passengers ride with feet dangling, or just able to maintain toe contact with the floor. This is manifestly uncomfortable. It is believed that a much more satisfactory condition would obtain if seat height were reduced to 17 in.

Then there is the question of the shape of seats. Certainly an otherwise perfectly good seat may be ruined by improper shape and slope to cushion and back. Conversely, a hard seat may be vastly improved if given proper form and if pitched correctly. Also seat width is important. An unsupported overhang of the end man, especially if the ride be long, never wins a friend for the road. The matter of foot rests and arm rests as seat auxiliaries is important. These details should be provided for long rides if possible, as they surely are conducive to comfort. Sufficient knee room is important. Attempts have been made to increase seating capacity by crowding seats more closely together, but to do so is to sacrifice comfort and cannot be recommended. The amount allowed in the standard city car dimensions of the A.E.R.E.A. is 29½ in. per seat. Nothing less than this should be tolerated. With the better upholstered seat backs and greater slant to them which is appearing in recent designs even greater space must be provided.

Attention is called to the devices that have been developed by bus builders to give added comfort to seats. They have used rubber in many places in such a manner as to permit a certain amount of movement to the seat, the idea being to cushion the jerk produced by a quick start or a sudden stop.

Merchandising of rides will be made easier if cars are properly heated and ventilated. Means of supplying adequate heat are at hand and mechanical men can readily take care of this phase of the situation. But to give satisfactory ventilation. "Aye, there's the rub."

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In the first place there is no accepted standard of ventilation for cars. A standard could be established that might be satisfactory to a majority of engineers and boards of health, but it would inevitably fail to satisfy all car riders. They do not understand ventilation and are guided almost entirely by their sensibilities. Their views and feelings are too divergent to accept any standard. However, a great deal can be accomplished along the line of ventilation. Exhaust ventilators are in almost universal use. Perhaps one of the most serious defects in the majority of cars is absence of proper air inlets. It is believed that the ideal system of ventilation would provide an intake and exhaust for each seat space and under the control of the passenger. This would at least place the ventilating means in the hands of the passengers, and in a way put the ventilation up to them. A scheme similar to this has been placed in operation in two big cities and has produced very satisfactory results.

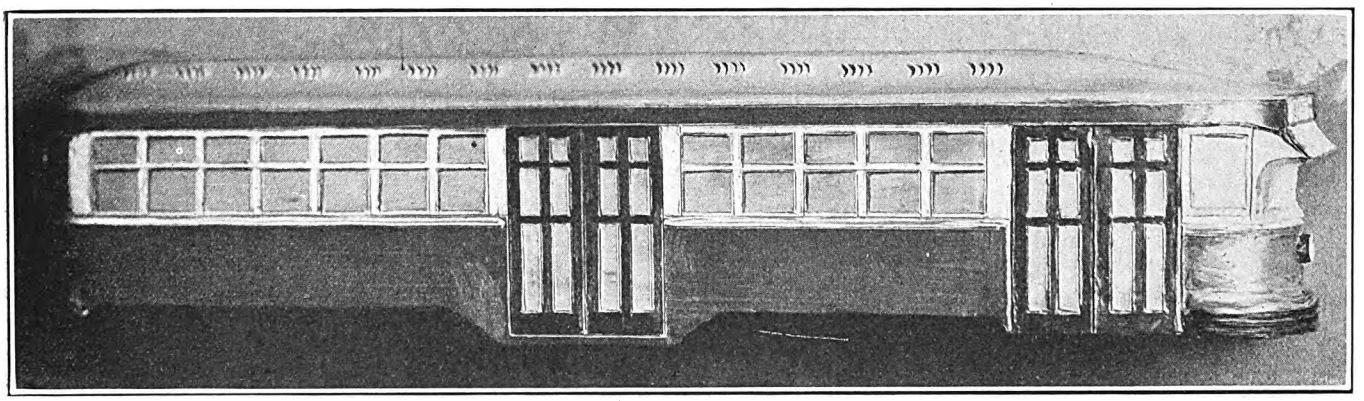
Smooth riding qualities of cars provide another fertile field for the mechanical men to cultivate. But there is need for much research work before this part of the problem can be conquered. The first step should be the development of adequate recording instruments, perhaps of the seismographic type, which will trace on paper the various components of car motion so that the personal equation will be eliminated. Following this the mechanical details can be tried out and their values readily determined. Lubrication of car springs has been tried and the report indicates improved riding characteristics.

Car signs are very important for the convenience of passengers. There are three principal elements which should be considered aside from mechanical details: First, the signs should tell the story of the car's route and destination as completely as possible; second, they should be of high visibility and, finally, they should be simple and easy of interpretation. Signs with multiple rolls giving a wide range of information have been used with great success. As to visibility, the requirements are plain lettering of as large size as practicable, sufficient illumination for night service and locations as high on the car as possible. It is believed that route numbers are essential to make the system simple. To the stranger in the city, nothing is easier than to get his car riding instructions by numbers.

In this connection, also, it is well to remember that the stranger in town, and often the resident, is at a loss to know which end of the car to enter. Many cities have front, center and rear entrance cars, so the traveler is sorely perplexed unless there is some designation on the front of the car giving him the needed direction. Removal of the petty annoyances to the passenger is always good business and in this case the cost is trifling.

The subject of floor covering is receiving much attention. The old wooden floor with slat aisles is being looked upon with disfavor where more modern and luxurious cars are desired. Surely a linoleum, rubber tile or similar floor cover makes for greater attractiveness and cleanliness and undoubtedly possesses a definite sales value.

We come now to the question of appearance of cars, for beyond a doubt this has a merchandising value too. It is a parallel case with the comparative sales value of a clean, up-to-date meat market and a dingy one. No one can question that the first will draw the bulk of the trade and get away with better prices. So it is with the street car. People want the best and are willing to pay for it. A great deal of thought and money have been spent to improve the appearance of cars, the Grand Rapids case being an outstanding example. It is believed that an improved and modernized design of car will do a great deal to convince the potential passenger that he can secure a sufficiently luxurious, safe, speedy and cheap ride to induce him to leave his auto at home. Perhaps a design imitating the automobile will prove popular. With double-end cars this becomes very difficult, but with the single-end car the solution is easier.



The Effect of Substituting Small Ventilators for Large Is Seen by Comparing This Clay Model with the One Shown Opposite

With this idea in mind, the writer is suggesting a slight change in present practice to meet the demand for a car of more pleasing appearance. To show this as clearly as possible a small clay model of the proposed design has been prepared. A reproduction of it appears herewith. The underlying idea in this design is to give to the trolley car the long, low, rakish lines so popular in automobile design. The front platform is drawn in or tapered and the roof is also tapered from the body proper. All this is to give the so-called "streamline" effect. It is to be noted that the rain deflector or gutter above the front doors pitches toward the front to help produce this same effect. Many cars have this line pitched the opposite way, but this is out of harmony with good appearance. The large multiple sign is similar to that used on the latest type of Detroit cars. This sign is not suggested in this design on account of beauty, but strictly for utilitarian purposes. The most radical element of the design is the visor over the motorman's window. This feature was added solely to improve the appearance of the car, though it has a distinctly practical use. Not long ago visors were prac-

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tically unknown on automobiles, but they have proved so useful that they are now used on most cars. In fact, on the latest models of sedans, the roofs are extended to form a visor and the beauty of the cars' lines are much enhanced.

The argument might be advanced that a visor as illustrated would not do, as it would require the motorman to remain seated at all times, whereas rules on certain roads require him to stand up at specified places. The answer to that is that the rule referred to is a relic of horse car and hand brake days and cannot be justified today. We might just as well make a man stand up when he is driving his automobile across a busy street intersection.

One feature of arch-roof design that has always been an eyesore is the ungainly appearance of the ventilators. The writer has the suggestion to offer that the number of ventilators be increased but the size relatively decreased, so that they may be less conspicuous. It might even be advisable to go to a composite form roof to permit a more satisfactory arrangement. The clay model was revised to show just what is intended and is reproduced herewith.

Would not a new car design on the order of these suggestions be worth while? And would it not give a newness and up-to-date appearance to our cars which would remove some of the stigma attached to the present types and give them added sales value more than sufficient to justify the trifling extra cost? All of the points raised are capable of solution if the proper incentive be given. Wishing alone will not do it, but wanting to make progress with sufficient zeal to devote to it the necessary effort and capital will bring forth every improvement.

Some Novelties in Overhead Work in Atlanta

The Georgia Railway & Power Company Has Developed Some Overhead Line Equipment Which Greatly Quickens the Work of Erection and Maintenance of the Overhead System — Other Practices Mentioned

BEING part of a very large electric railway and power system, the electric railway department of the Georgia Railway & Power Company at Atlanta, Ga., has been able to utilize to a very large extent the experience of the power branch of the company in its engineering methods. This exchange of methods is particularly close in the distribution department. It is not surprising, then, to find that the railway overhead department in Atlanta has developed a number of methods and types of machines for doing quickly a great deal of work which, by older methods, would take a much longer time.

Setting Poles

One of the most useful of these machines is one for digging holes for poles. The standard pole of the company is a creosoted long-leaf yellow pine pole, grown in Georgia. This type of pole has been used exclusively by the company for the past three years and is estimated to have a life of about 20 years. Poles of this kind can be bought treated for about $11. They are set in earth without concrete, except in the case of a dead-end pole, and require a hole about 6 ft. deep and 24 in. wide. These holes are dug by a Western Electric pole-hole digger of the kind shown in the accompanying illustrations.

When used in ordinary dirt, this machine can dig a hole 6 ft. deep and 2 ft. in diameter in about 3 minutes. The operator lets the bit down until it has penetrated to a depth of about 2 ft. By this time the bit is clogged with dirt, and when it is withdrawn the dirt will be found to be sticking to it in a compact mass. The bit is then freed by being revolved rapidly above the hole and the dirt is thrown off by centrifugal force. The bit is then dropped into the hole again and the process is repeated once or twice until the hole is ready. The digger is known as the F. W. D. four-wheel drive type.

The pole is then set by a derrick, which raises the pole at its center of gravity and drops it in place. The digging machine shown can also be used for setting poles and under favorable conditions can dig the hole and set a pole all in seven minutes. As a rule a separate derrick is used for the setting process because of the demands on the digger for digging work. Only two men are required for this setting operation, the driver of the derrick truck and one other man.

Altogether the Georgia Railway & Power Company has about 41,000 poles within the zone formed by a 7-mile radius from the center of Atlanta. With their creosote protection these poles do not require painting either for preservation or appearance. In fact, the pole lines of the company are noticeably attractive in appearance because of their straightness, regular spacing, uniformity and dark hue.

Stringing Live Trolley Wire by Truck

Another piece of equipment which has been found very useful in Atlanta is the tower truck for stringing trolley wire shown in accompanying illustrations. Except for the truck itself, this piece of equipment was built in the shops of the company for a cost of about $750. It has been in constant use since its completion last summer, with a great reduction in time and labor for both stringing new wire and repairing breaks.

Formerly, for stringing any extended stretch of wire, use was made of three cars. First came a 1½-ton truck, which hauled the reel car. This made two cars, and these two were followed by a tower car carrying the linemen to make the attachments. Besides the force required to man this train, it was objectionable because of the room taken by it on the street. Now all of this work is done by the single tower truck shown.

The reel is carried in the center of the truck and the wire is paid out over the 10-in. swiveled sheave, ad-

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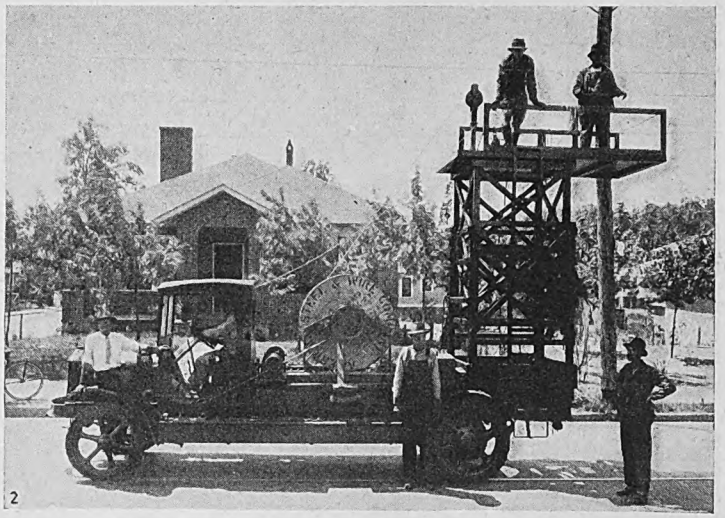
Atlanta Has Been Able to Facilitate Overhead Line Construction and Maintenance Greatly by the Equipment Illustrated on This Page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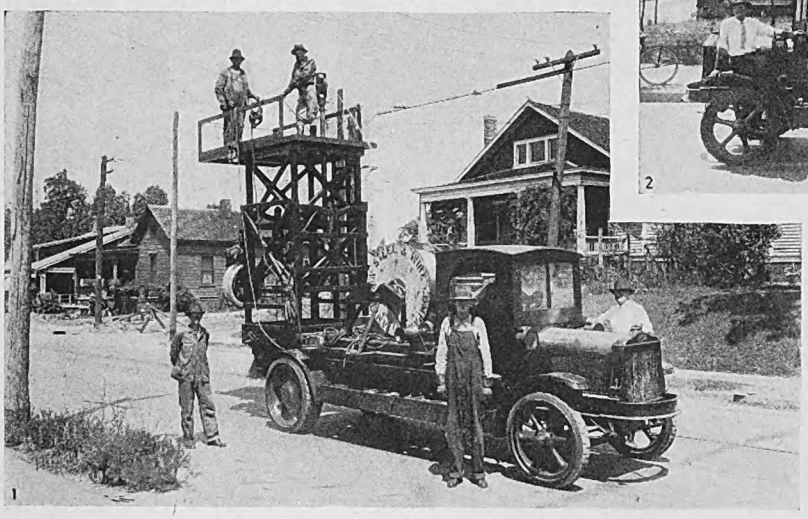
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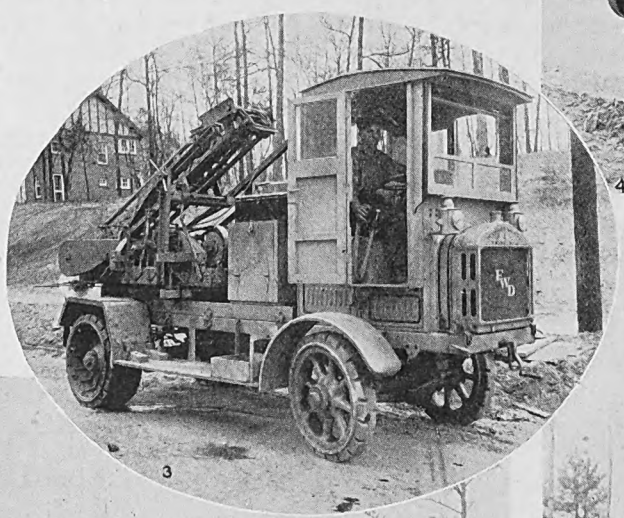
The tower car shown in illustrations 1 and 2 can string a mile of trolley wire in 30 minutes.

The company's pole digging machine is illustrated in Nos. 3, 4, 5 and 6.

It will dig the hole for a pole in three minutes. This pole hole digger is backed up to the point where the hole is to be dug. The bit is run down about 2 ft., then lifted up and cleared as shown in illustration No. 6, then lowered again and the process continued till the work is done. View No. 3 shows the machine returning from work.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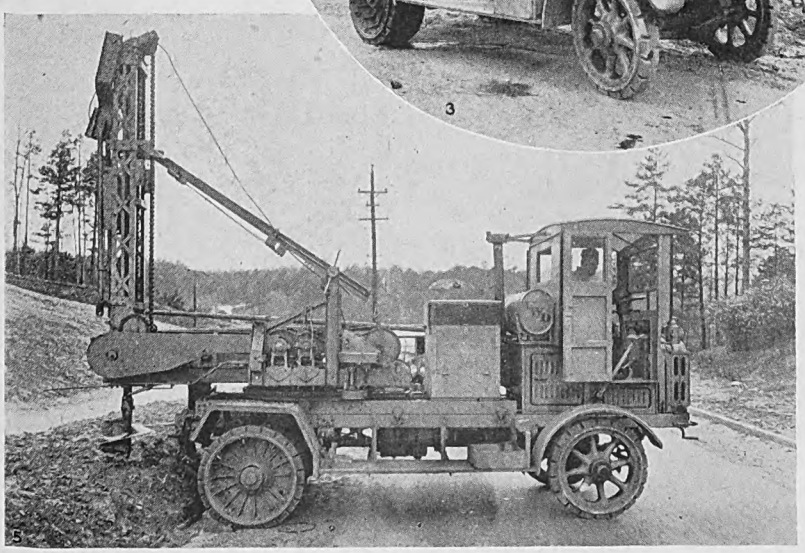
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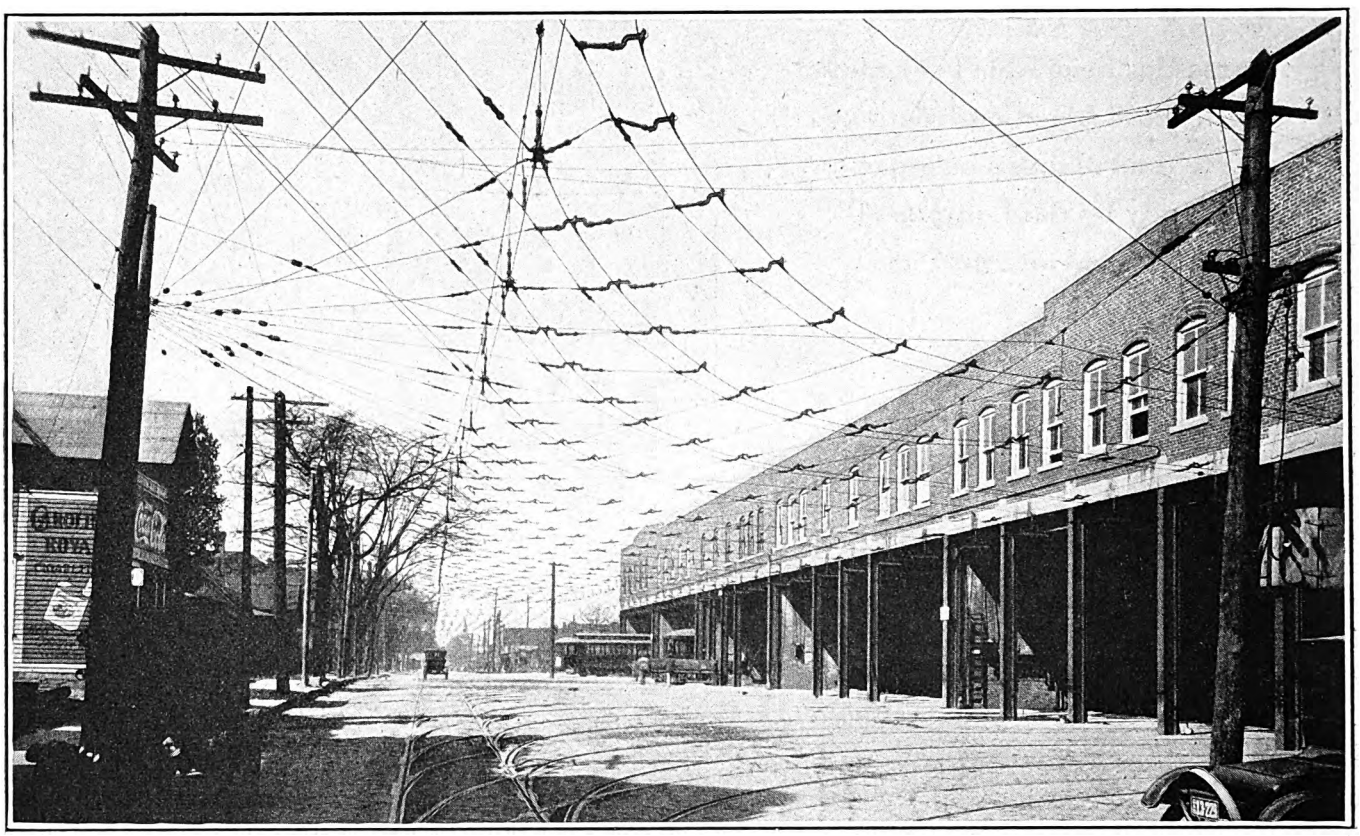

Attractive Overhead Construction at a Carhouse Entrance, Atlanta. All Curves in Atlanta Are "Backboned" in the Same Way as These Curves

justable as to height, shown in the view about 3 ft. above the working platform of the tower. The band brake on the reel is controlled by the driver of the car, who also raises and lowers the tower by motor. The connection between the motor shaft and tower-raising shaft is by sprocket chain, not shown in the illustrations. This sprocket chain is protected by a shield for the sake of safety.

This car requires only a single crew, which can string a reel of trolley wire (about 5,280 ft.) in about 30 minutes. The usual practice is for this car to be followed by a regular tower car, whose crew does the insulation. This takes a longer time, so the crew of the first car, after stringing the reel, returns to help insulate. Altogether it takes about 2½ hours to do both operations of stringing and insulating a reel of trolley wire. Obviously, the tower has to have considerably greater strength than the ordinary tower as it has to take the strain of the wire. As a rule all trolley wire is strung live.

This tower car is also used extensively in repair work, and when so employed it carries a crew of two men. On reaching a break the driver runs up the tower with the lineman on it. About ten minutes is all that is required usually to fix a break.

Features of Overhead Work in Atlanta

There are some features of the overhead work in Atlanta, in addition to the equipment used, which should be mentioned. Most of them are illustrated in the general view of the entrance curves to the Piedmont Avenue carhouse in the accompanying illustration.

All curves are "backboned" by an extra wire, which is a $\frac{1}{0}$ wire, stranded. The result is that no difficulty, practically, is experienced from a curve break. As the pull-offs are placed about every 7 ft., a broken trolley wire on a curve cannot swing very far, and two men on an emergency truck can repair the trouble with a sleeve or new section of wire very quickly, because, with only 7 ft. between pull-offs, the man on the tower can reach both ends of the break without trouble. The short spacing of pull-offs also makes the trolley wire take a very even curve and so reduces wear. No. 000 trolley wire is used.

Another feature of the overhead construction shown is the use of two strain insulators on each side of the trolley wire in all spans. One of these strains is near the trolley wire, the other about 5 ft. from the pole. In consequence, a man working on the trolley wire cannot touch a ground, and in the same way a man who happens to be working on the pole cannot touch a live span wire. In the view shown wooden strains are used near the trolley wire and porcelain strains near the pole, but often porcelain is used in both places.

No Pull-Ins for Five Days at Harrisburg

ON FIVE consecutive days last month the cars of the Harrisburg Railway operated a total of 50,103 miles without a defect serious enough to require a pull-in. The daily record for this period was as follows: March 24, 10,414 miles, 90 cars operated; March 25, 10,386 miles, 89 cars operated; March 26, 10,375 miles, 89 cars operated; March 27, 11,107 miles, 91 cars operated; March 28, 7,911 miles, 49 cars operated.

The Paris Tramway System has recently put in service a single-truck radial axle car which has a length between bumpers of 37 ft., with a wheelbase of 11 ft. 10 in. The car is of the center-entrance type and has a capacity seated and standing of 49 passengers.

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Modernizing Dipping and Baking

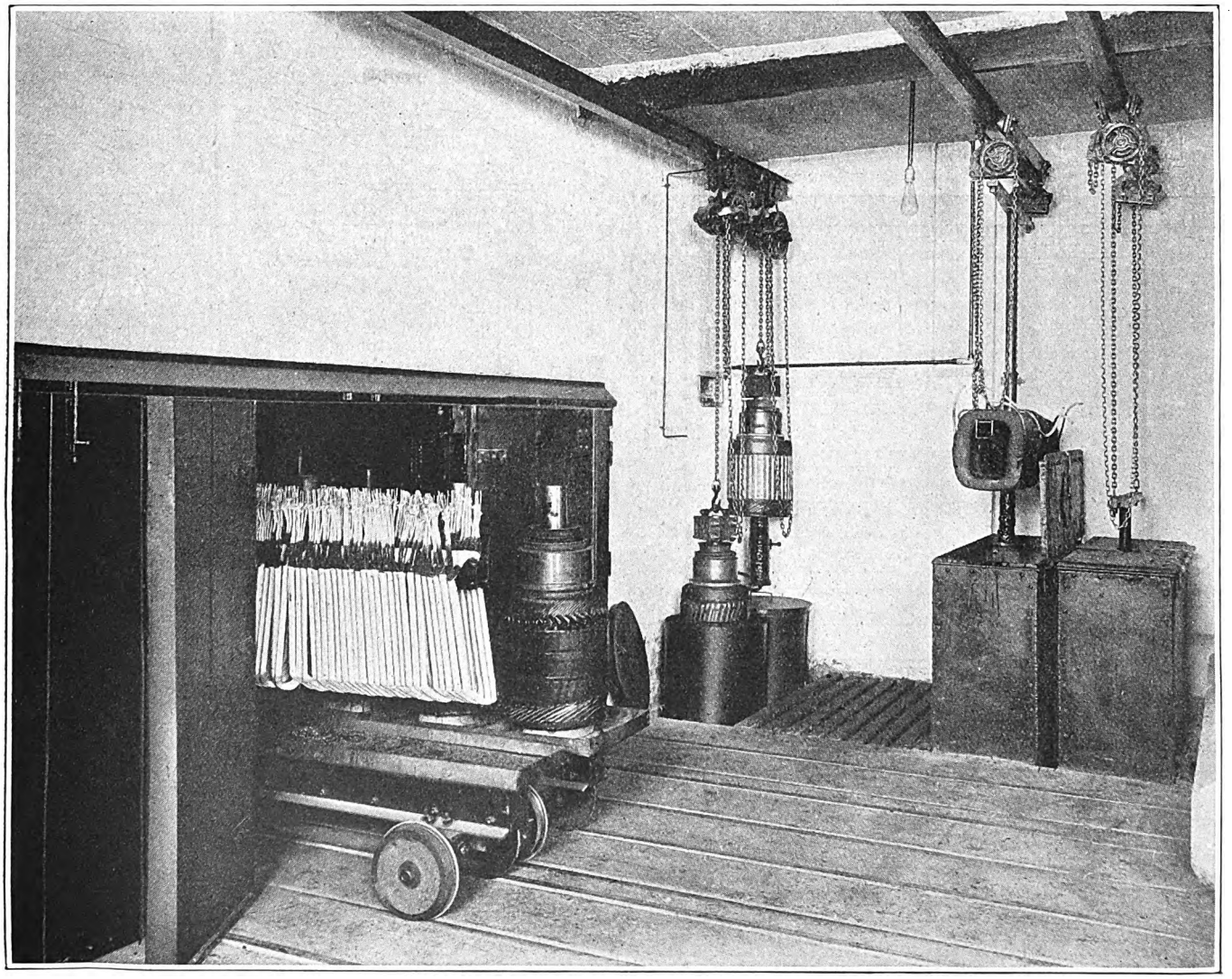
Facilities for Dipping and Baking Electrical Equipment in the Shops of the Montreal Tramways Were Increased in Size and a Number of Improvements Made to Facilitate Handling of Equipment and Reduce Labor

By Julian M. Scott
Assistant Superintendent of Rolling Stock Montreal Tramways, Montreal, Canada

IN ORDER to take care of the increase in work which was necessary to be done in connection with dipping and baking of electrical equipment and to provide for the use of the most modern methods in this work, the Montreal Tramways found it necessary to revise entirely its dipping and baking facilities approximately two years ago. The original oven was 4 ft. 6 in. square and had vertically sliding doors. It was steam heated by pipes on the floor and wall. All material was handled into and out of the oven through the use of small hand trucks.

An extension of the dipping and baking facilities was provided by removing a section of wall which was alongside a passage equipped with fire doors and by extending the adjacent wall until it met the main shop wall. This section was equipped with impregnating tanks, vacuum pumps, dipping tanks and overhead trolleys for handling materials. An oven was provided alongside this section by adding a lean-to along the entire length. Connection between the section used for dipping and the oven is through five pairs of double sheet steel doors. These are insulated with cellular asbestos blocks. Ten tracks are provided into the oven for operating trucks in and out.

The tracks consist of 3-in. channels laid flush with the floor and with a small wheel flange groove. With



Trucks with Armature Coils and Armatures Are Seen at the Left as They Are Being Rolled into the Oven. The Armature Dipping Tanks with Chain Hoists and Overhead Trolley Are Seen in the Center, and at the Right Are Two Tanks Used for Dipping Field and Armature Coils

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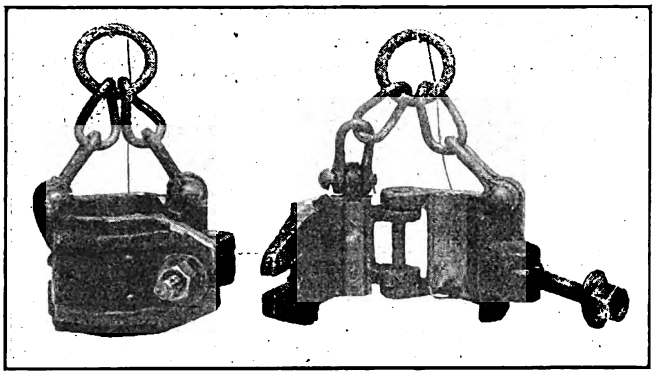
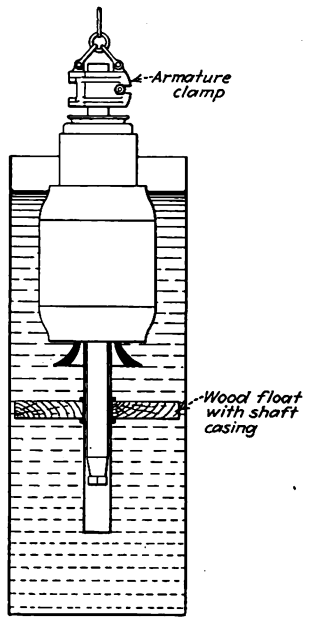


A Hinged Steel Clamp with Copper Gripping Strips Is Used to Grip the Ends of Armature Shafts During Lifting

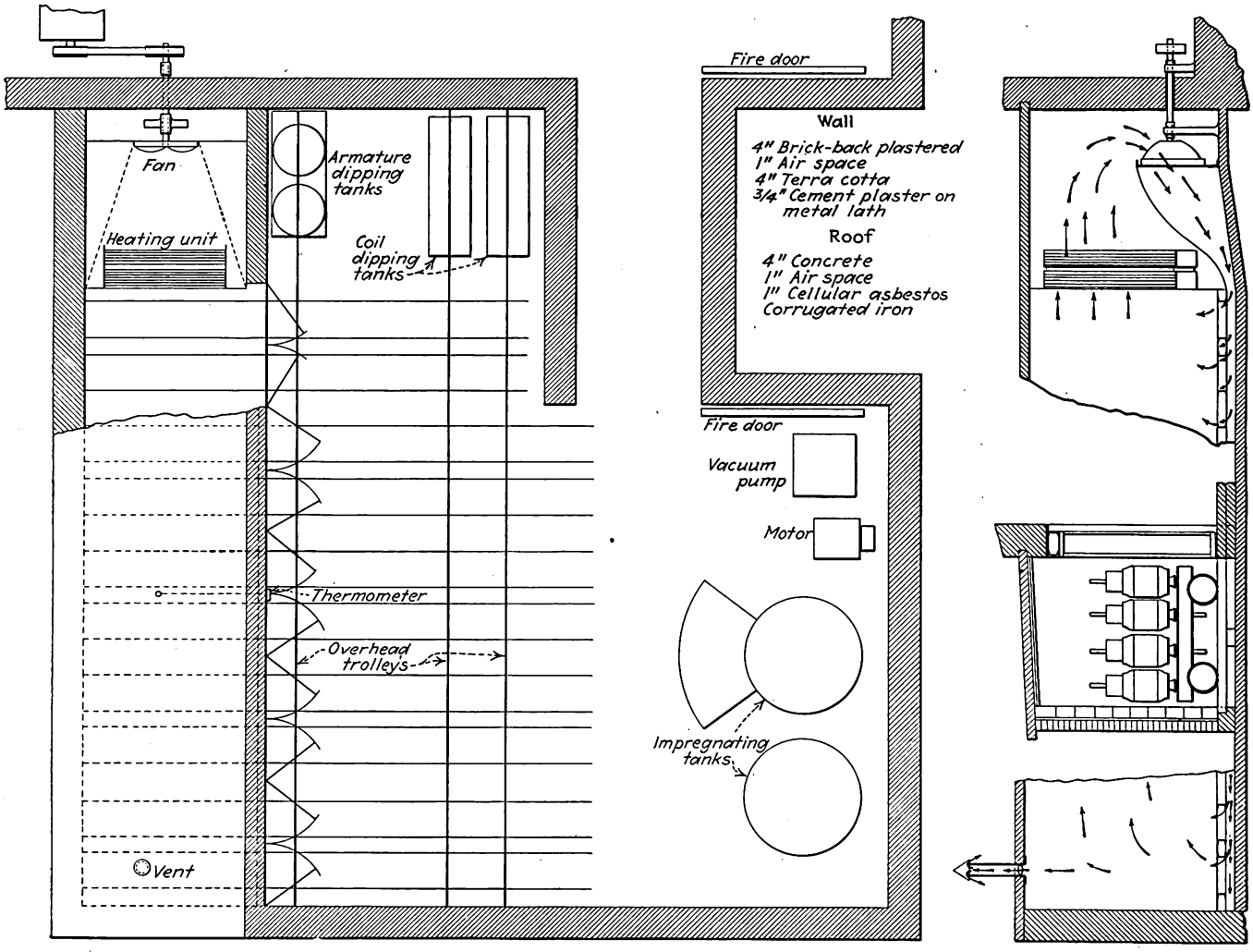
this construction the floor presents a practically unbroken surface which is excellent for working on or for trucking. Accompanying line drawings show the original room and a layout of the facilities now provided.

The oven is heated by a single set of vertical steam coils installed at one end. Air is drawn through the steam coils by means of an ordinary ventilating fan set in a steel partition, and the air is then discharged into the duct formed by the bottom of the oven and the tracks. A temperature of 240 deg. F. is easily maintained and a dial type thermometer is provided on the outside to indicate temperature. All spaces between the rails are filled in with loosely fitting steel plates. This permits a gradual passage of heated air from the ducts through the length of the oven and maintains a very even temperature in all parts.

The trucks now used are of a new type and are all alike. Each remains on its own track. The truck body consists of two 6-in. channels bolted together. These are placed back to back and an oak platform ¾ in. thick is installed over this. This platform consists of five blocks and space is provided between each pair, just sufficient to accommodate the ends of armature shafts. With this arrangement four armatures can be installed on a truck for baking. The center block has a hole provided to receive a pin for a pivoting rack which is used to hold armature and field coils. Drippings from the coils or armatures are caught in removable iron pans. These extend over the entire truck platform and have either one or four holes as required for either armature or coil baking.



Keeping Armature Shafts Dry
Armature shafts are kept free from the varnish during dipping by having a float with a pipe center to receive the armature shaft.



General Layout of the Dipping and Baking Section in the Shops of the Montreal Tramways

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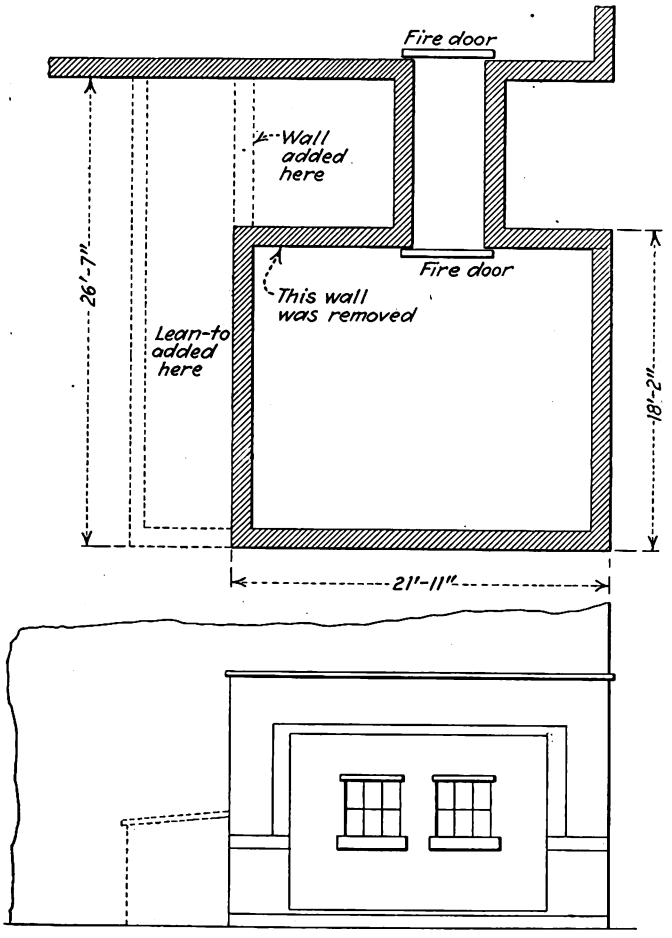
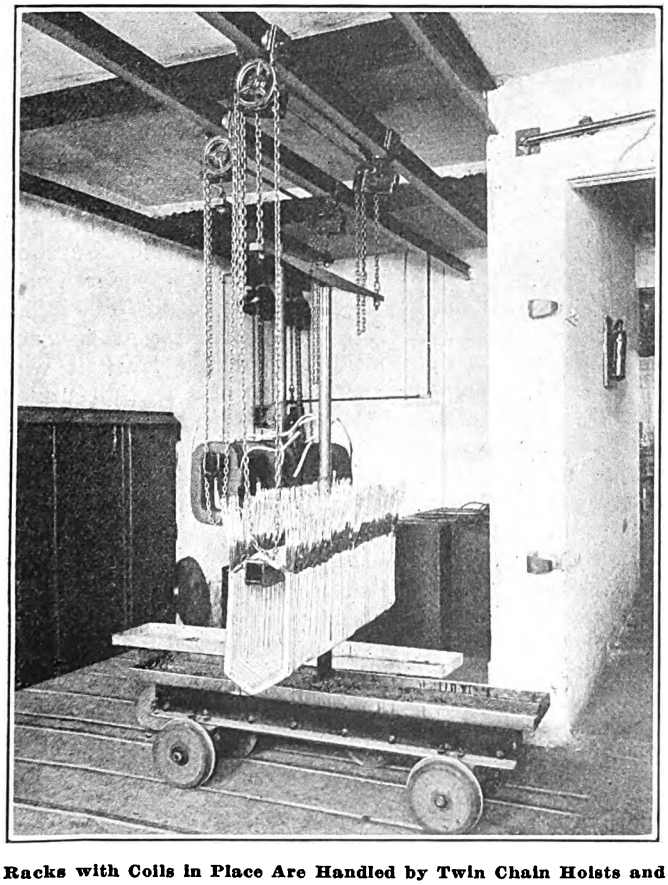


Original Section of the Shop Before Changes Were Made to Install Dipping and Baking Equipment. Full Lines Show the Walls as They Were Originally and the Dotted Lines Show the New Construction



Racks with Coils in Place Are Handled by Twin Chain Hoists and Are Readily Placed in Position on the Truck by One Man

The racks for supporting field and armature coils during baking have a central upright member made of iron pipe. The bottom part of this fits over the pivot pin in the truck and the upper end is fitted with a bar for lifting. Lifting is done by two chain hoists, which attach to the end of the lifting bar. The racks are made with either a single or two crossbars. The single racks are used for armature coils and the two-bar racks for field coils. These crossbars pass either through or on each side of the vertical iron pipe, as shown in an accompanying illustration. Ninety armature coils or ten field coils can be handled by a single rack.

The entire operation of dipping and draining coils is carried out in a completely closed tank. A rack loaded with coils is placed over the tank by the twin chain hoists and is lowered into the varnish to the correct depth. The cover of the tank has a slot in it to allow the stem of the rack to pass through. The cover can thus be closed and the outer ends of the slot sealed with small hinge plates, thus completely closing the tank.

For draining, the coil rack is raised until the coils occupy the space between the varnish and the cover. They are allowed to remain in this position with the cover closed until the draining operation is completed. When fully drained the tank is opened and the coil rack is raised and moved so as to lower it onto the truck for running into the baking oven. The cleanliness and economy of this method can be well appreciated by those who are doing a considerable amount of dipping and baking. Increased production and improved quality of the material are obtained with an absolute minimum of comparatively easy labor, and there are no messy features in the operation, as the dry coils or equipment are the only parts that are touched.

Armature dipping is done in two round tanks with plain covers. An overhead trolley passes directly above the tanks, so that armatures are handled by traveling hoists. Definite stops provided on the overhead track center the hoist directly over the tank. The stop over the first tank is removable, so that this can be taken out of the way when the second tank is used. All varnish tanks are set in a pit 3 ft. 6 in. deep.

A very novel and interesting feature has been developed to protect the armature shaft from the varnish while dipping. This is shown in an accompanying illustration. A light galvanized iron pipe of a size sufficient to accommodate the largest armature shaft is used to protect the shaft during dipping. A wooden float of 15 in. diameter by 4 in. thick is placed around the galvanized iron pipe. The float with pipe remains permanently in the armature dipping tank. When dipping an armature, the shaft enters the pipe, and as the lowering continues the base of the end bell rests on top of the float so that the entire device is carried down with the armature into the compound. The cup-shaped end bell forms an air-closed chamber so that varnish does not enter the pipe. As the armature is raised, the float follows up and assumes its original position. This method is clean and economical and is a great time-saver. It is also very popular with the men.

A special clamping mechanism is used on the armature shaft. This is shown in another illustration. This consists of a hinged steel clamp with copper gripping strips and a single clamping bolt. Chains with a ring at the top provide for attaching the hooks of the hoists. Originally a split wood block with a diagonally square hole and four clamping bolts was tried, but this proved unsatisfactory.

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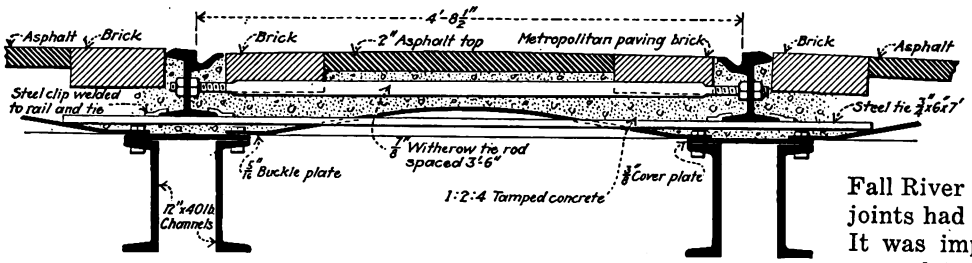
Thermit Welds Used in Rapid Track Reconstruction

Union Street Railway Builds Three-Rail Sections at Side of Street and Installs Them During Hours When Service Is Suspended—Many Joints Welded in Open Track

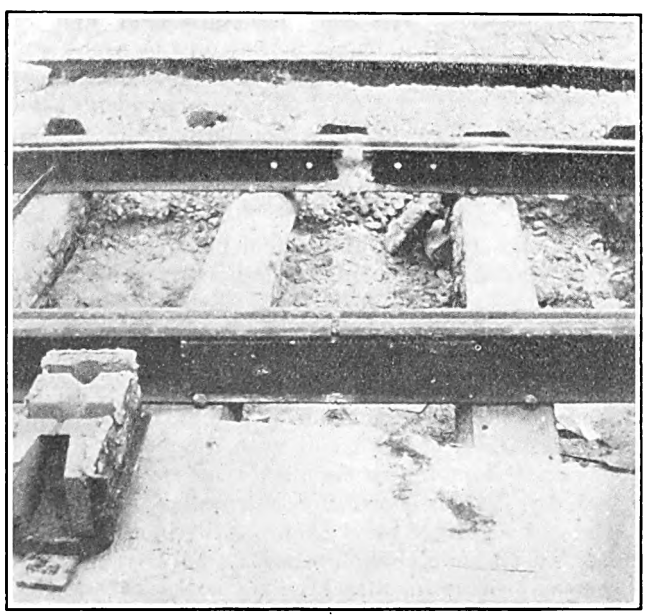
DURING the past three years a complete thermit welding outfit, together with various acetylene torches and a preheating device, has been used extensively by the Union Street Railway, New Bedford, Mass., in track reconstruction work. New rails were laid in two districts of the city where it was impossible to reroute the cars during the progress of the work. Tracks were in constant use from 5 a.m. to 1 a.m. the next day, and the method followed in the reconstruction was to build up complete sections of new track alongside the existing track and to install it during the four early morning hours when service was suspended. Use of thermit welding greatly facilitated this process.

While the tracks were in service the old concrete and dirt were cleared away from the rails and ties. New rails were 7-in., 122-lb. Lorain section No. 491 in 66-ft. lengths. Three-rail sections were lined, surfaced,

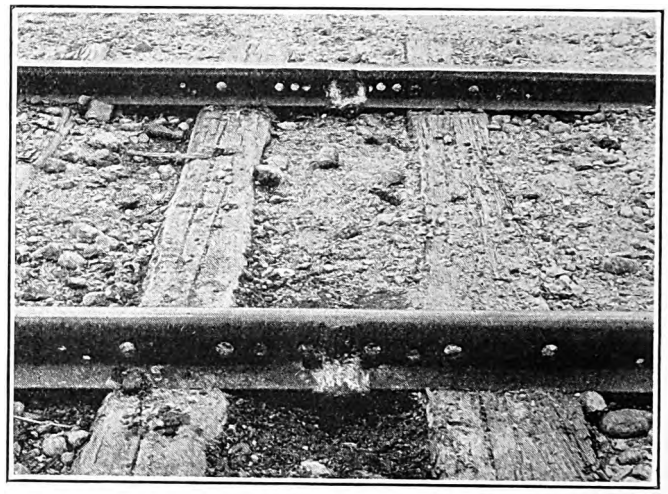


Construction Used by Union Street Railway on Fairhaven Bridge. Rail Base Is Welded to Steel Ties Placed at Depressions in Buckle Plates

and welded together alongside the excavation. During the four hours when there was no service the old rails and ties were quickly removed and new ties "spotted." Then the three-rail sections were rolled into position and properly lined and surfaced. Because of using this



When Time Is Limited Joints Are Temporarily Plated and Spot Welded. Thermit Welding Is Done Later



Welded Joints of This Type Are Used in Open Track Between New Bedford and Fall River

method it was necessary to weld only four joints to complete the installation. If time was limited these joints were temporarily plated and welded the following night.

An accompanying illustration shows two joints, one a finished thermit weld and the other temporarily plated and spot welded at the base. This spot weld holds the ends of the rails in proper alignment when the plates are removed to thermit weld the joint.

On the New Bedford and Fall River interurban line many of the rail joints had become badly battered or worn. It was impossible successfully to bolt on new plates due to the fact that the old plates had worn into the head of the rail. Two hundred of these were thermit-welded with an expansion joint, a regular bolted fishplate, located every 500 ft. The rail is 70-lb. T-section in 33-ft. lengths and is entirely exposed to the atmosphere. Although this thermit welding process has been in use for three years, a joint failure has yet to be experienced.

Double track recently was relaid on the "mile bridge" that connects New Bedford and Fairhaven. Part of this trackwork was located on the steel bridge itself while the other part was located in a dirt fill. The same rail as in the two other districts was used. By operating on one side of the double track it was possible to discontinue service on the section under reconstruction. Before the thermit joints were made the new trackwork was concreted in except around the rail joints. By this method the rail was firmly held in position so that when the thermit metal was poured a nearly perfect butt-weld was made.

In the section on the steel bridge, the old rails had been fastened to the bridge by the use of long through bolts. It was found that many of these bolts had become loose, broken off or badly corroded. In order to overcome this difficulty the new rails were seam-welded to flat steel ties. Bethlehem Steel Company design No. 982 plates were used as it was not considered advisable to use the thermit joint on the steel bridge. The general construction of this trackwork is shown in the accompanying drawing. After the work was completed, it was allowed to set for two weeks before cars were permitted to operate over it.

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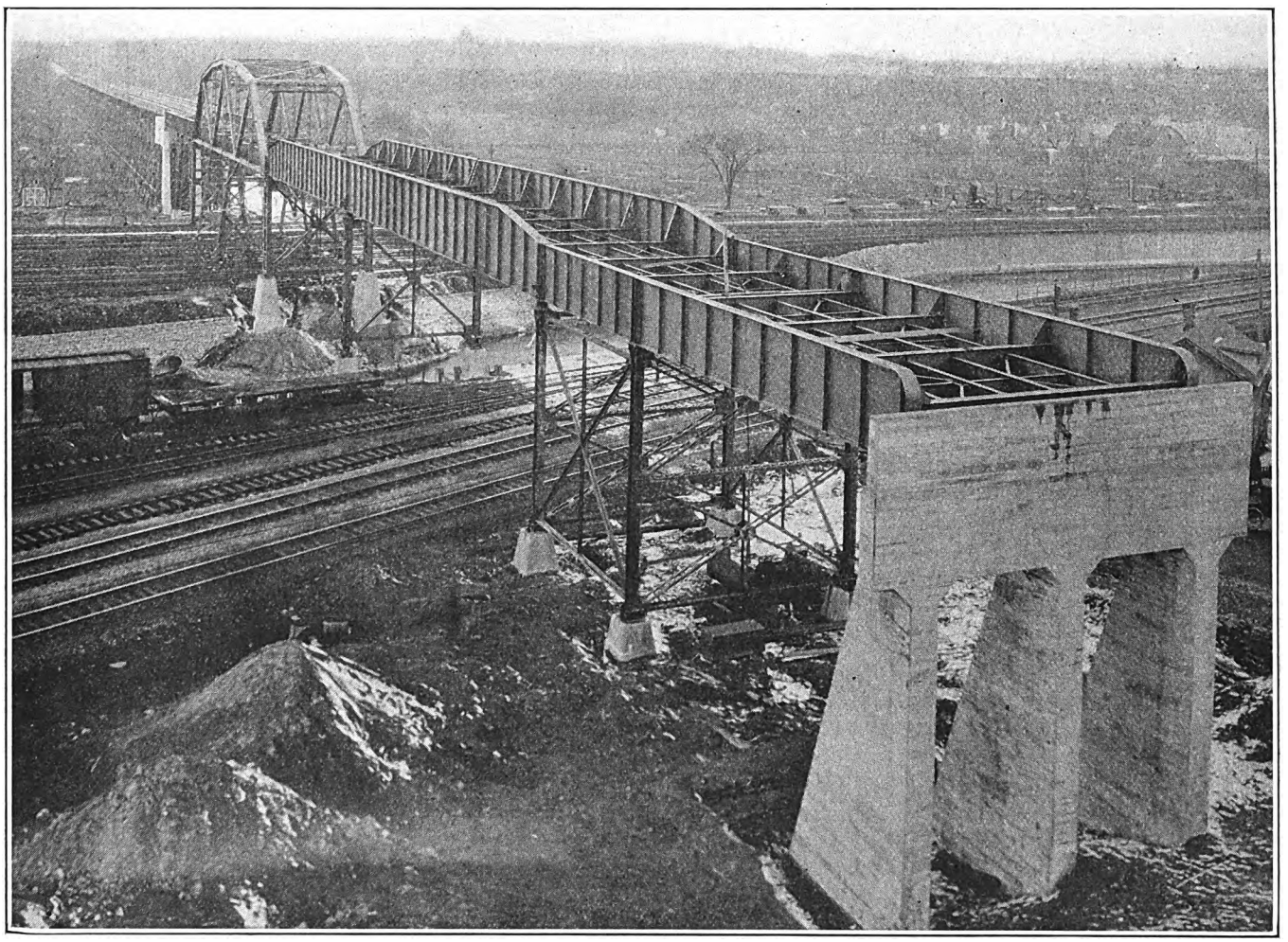
Rapid Transit Line Constructed for Milwaukee

High-Speed Suburban Line and Interurban Cut-off Near Completion—Construction Involves Many Phases of Railroad Engineering Including Cuts, Fills, Grade Separations, Interesting Bridge Erection Features, as Well as Timber Trestle Work—Line Was Built in Winter Months



Steel Work Over the C., M. & St. P. Tracks and Yards and the Menominee River. The Abutment in the Foreground Marks the End of the East Fill. The Wood Trestle Is Seen in the Distance

CONSTRUCTION work is nearly finished on the town of Wauwatosa rapid transit line between the Milwaukee city limits and a point just west of West Allis. It remains only for the advent of warm weather and approximately two months of intensive work until the Milwaukee Electric Railway & Light Company will be able to put into operation Milwaukee's first rapid transit line. It will traverse a rapidly growing suburban territory and service over it will bring the city of Waukesha, 18 miles from Milwaukee, fifteen minutes closer to the city, making it virtually a suburb of Milwaukee. The analysis of traffic conditions and an outline of the survey which prompted the line's construction, together with operating features, will be dealt with in a subsequent article that will be published some time after the line is put into operation on June 1.

Leaving 35th Street, Milwaukee, at a point about 400 ft. south of Clybourn Street, the new line runs west to 37th Street, and then on a reverse curve skirts the edge of a bluff to a point of land which juts out into the Menominee Valley at the foot of Park Hill Avenue. From this point it crosses over the Chicago, Milwaukee & St. Paul Railway main line tracks, the Menominee River, the yards of the C., M. & St. P. Ry. and Aranuld Avenue on a steel structure 600 ft. long consisting of four through girder spans and one through truss span of 175 ft. The line then proceeds across the bottom lands of the valley on a timber trestle 45 ft. high and 1,800 ft. long. Passing through a portion of the National Soldiers' Home grounds it connects with the old right-of-way of the Wells-West Allis suburban line. Operating jointly with this line for about 1 mile it then continues due west and is alternately carried on fills and through cuts affording grade separation for

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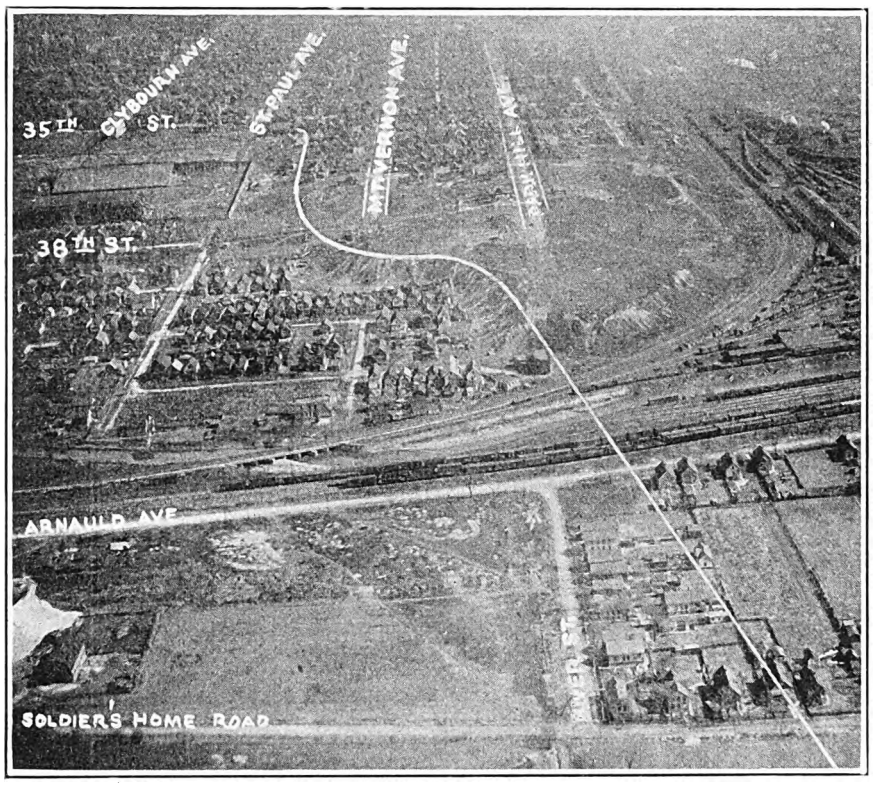


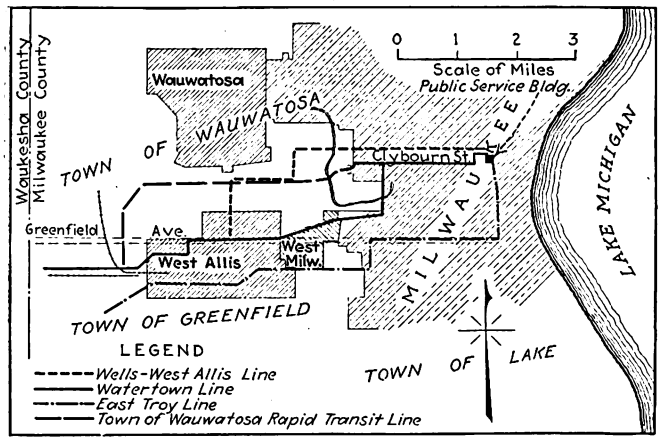
This Aerial View, with the New Route Painted In, Was Used to Show the Railroad Commission that Streets and Alleys Would Not Be Closed

all street crossings to an intersection with the present Waukesha-Oconomowoc-Watertown interurban division at a point just beyond West Allis. The new line is 5½ miles long.

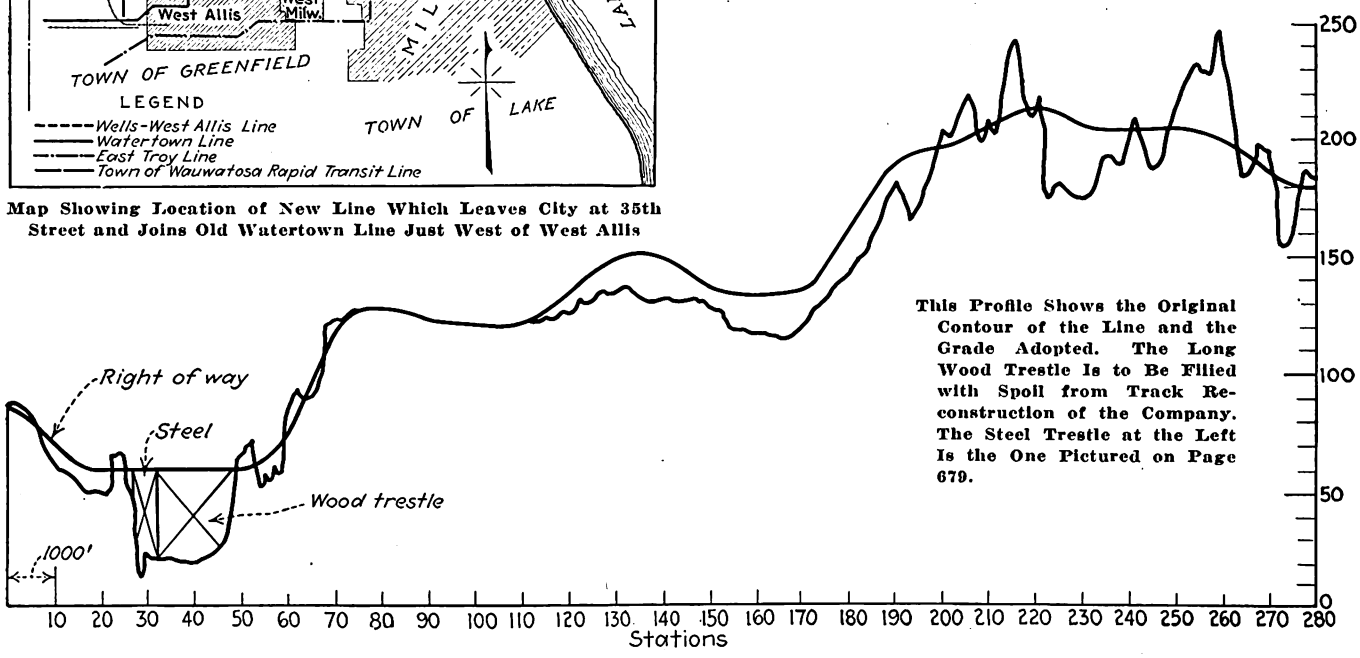
Features of the construction include the convenient approach into the city, wherein advantage was taken of the natural topography to simplify construction; the long timber trestle, built with the idea of permanent fill in the future; the extensive grading which resolved itself into a car job from a borrow pit, with a subsequent relocation of roads and viaducts; and lastly the rapidity with which the work has progressed during the winter months. Contracts for the work, representing an expenditure of $1,250,000, of which approximately $750,000 was for construction, were let during October, 1925. The survey, layout, engineering, inspection and design of all structures were handled by the engineering department of the railway. Practically all of the grading was contracted for, as was also the erection of the steel work.

Once started, the work has been carried on through the winter almost as expeditiously as during the summer, inasmuch as the major part of the material for fills was taken from a large borrow pit. This borrow was made by leveling off high hilly ground to make it suitable for residential purposes. Very few delays were encountered because of sub-zero weather.

Fifteen grade separation structures were erected, which consisted for the most part of three-span deck girder bridges, except in the case where a road through the Soldiers' Home was relocated on an elevated grade over the line with a concrete structure. Fabricated steel totaling 650 tons was employed in the large bridge across the Menominee Valley. Accompanying illustrations show this bridge, together with the wooden trestle, and the method used in placing one of the 114-ft., 80,000-lb. through girders over the main-line tracks of the Chicago, Milwaukee & St. Paul Railway. A gallows frame was mounted on a railway flat car properly supported and braced, and accurately spotted so that when the girder was raised to position it could be swung into its exact location. The other end of the girder was



Map Showing Location of New Line Which Leaves City at 35th Street and Joins Old Watertown Line Just West of West Allis



This Profile Shows the Original Contour of the Line and the Grade Adopted. The Long Wood Trestle Is to Be Filled with Spoil from Track Reconstruction of the Company. The Steel Trestle at the Left Is the One Pictured on Page 679.

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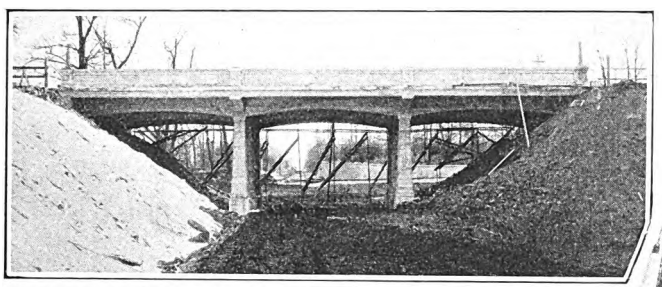
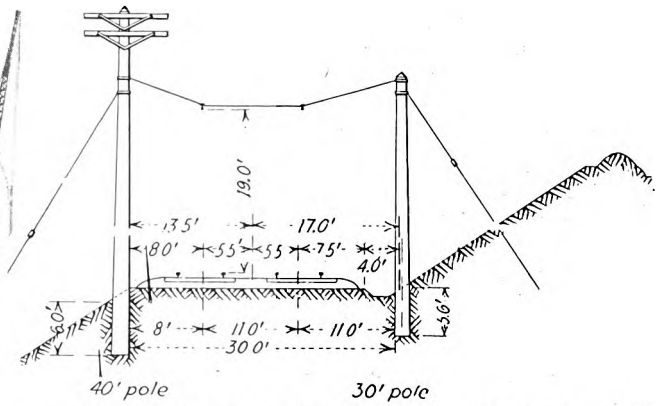
raised by a derrick mounted on the partially completed overhead structure.

As previously mentioned, 1,800 ft. of the line is carried on a timber trestle. This is of standard railroad type construction with pile foundation. A timber trestle was used because it is planned ultimately to fill this portion of the right-of-way. The close proximity of this trestle to the center of Milwaukee prompted its construction, as it allows for easy transportation and disposition of the refuse and dirt removed from city

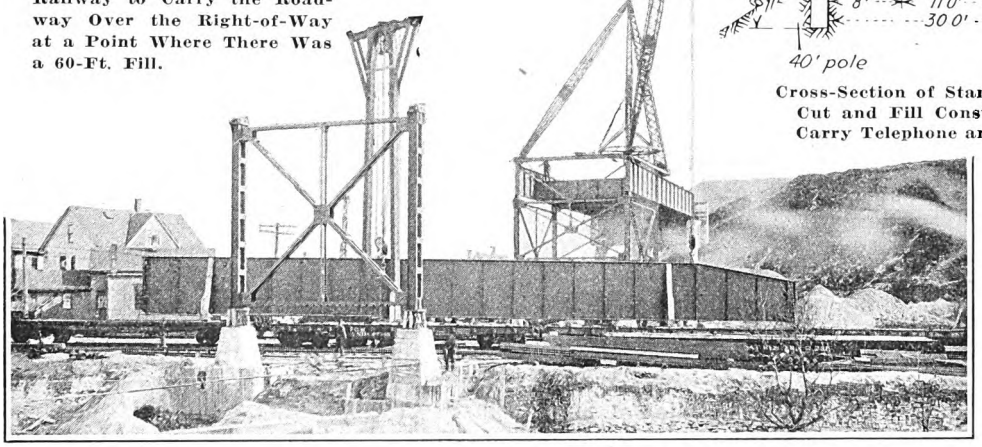
Prior to the laying of track, however, the overhead line department went in on the frozen grade and erected the poles, span and trolley wires. Holes for the poles were dug and the poles raised into position by an earth boring machine mounted on an automobile truck. This machine averaged better than eighteen holes per day. It was followed up by a pole crew which lined up and back-filled the poles raised and set by the machine. As soon as a sufficient number of poles were erected, the cross spans, anchor guys, and No. 0000 grooved

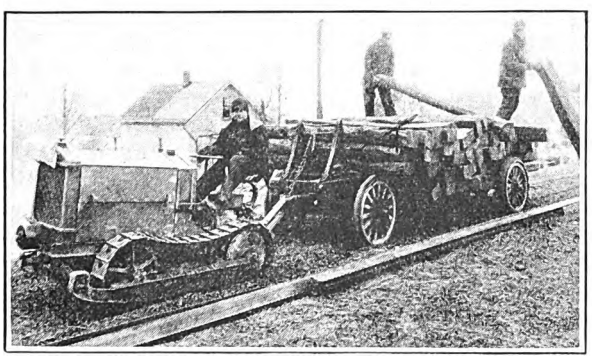


A Concrete Bridge Built by the Railway to Carry the Roadway Over the Right-of-Way at a Point Where There Was a 60-Ft. Fill.

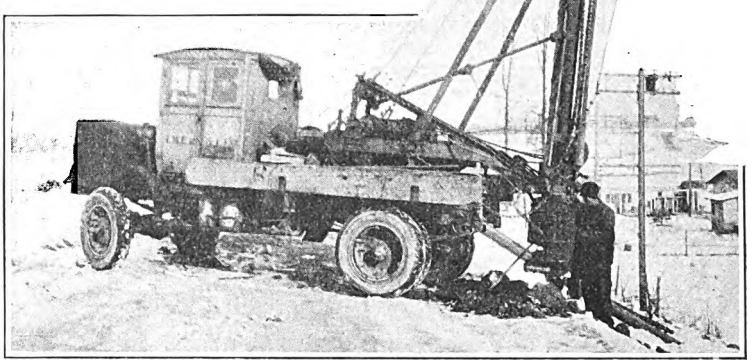


Cross-Section of Standard Type of Grading Used on Both Cut and Fill Construction. The Pole at the Left Will Carry Telephone and Feeder Cables





Center — Raising a 114-Ft., 60,000-Lb. Girder for the Trestle. The Gallows Frame on the Flat Car Was Used to Lift One End of the Girder.



Below, Left—Rails and Ties Were Hauled Into Position Over the Frozen Ground by a Caterpillar Tractor, so that the Work Was Facilitated.

Below, Right—Holes Were Drilled in the Frozen Ground by an Earth Boring Machine and Concrete Poles and Overhead Were Erected Before Laying Track.

track reconstruction work. It is estimated that it will take between ten and twelve years to complete this fill.

One of the extensive grading operations involved the cutting of the right-of-way around a bluff approximately 60 ft. in height. A small portion of this work remains to be completed. As soon as the grading on a portion of the line was completed, cinders to a depth of 6 in. were spread over the top. With the cinders in position, it was then possible for the company to go ahead with the track-laying work. A spur track was constructed on the Wells-West Allis interurban line at a point where the new right-of-way branches off of the old line. This siding was used by work trains.

trolley wire were installed. This unusual procedure of erecting the overhead before the tracks were laid was made possible because of the frozen condition of the already completed roadbed or railway grade which permitted using the motor truck earth boring machine.

Rails delivered at the siding by the supply train were transported along the railroad grade by a small caterpillar tractor. Ties loaded on a highway trailer were also distributed by the tractor for the first track. A track gang followed assembling the track and bringing it to approximate alignment.

With one track in position and power on the trolley it was possible to utilize motor-driven work trains

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for delivering rail and ties for the other track. This work was followed by the placing of crushed limestone ballast by Differential dump car trains. All of this rolling stock and equipment was furnished by the way and structures department utility service. The limestone was obtained from the company's own quarries on the Milwaukee Northern Railway interurban line, a subsidiary of the Milwaukee Electric Railway & Light Company.

The track is of open construction with 5-in., 80-lb. A.S.C.E. standard tee rail. Tie plates and continuous splices employing heat-treated bolts were used throughout. The rails are carried on hewn cedar ties on tangent track and on treated oak ties on all curves. This latter practice insures stability and resistance to side thrusts.

In obtaining the right-of-way into the city, the company purchased the majority of the property, only resorting to condemnation proceedings in a few cases. The location around the edge of the bluff near the city limits made it unnecessary to close or relocate streets or alleys, as none existed on the side of this hill except as were shown on recording plats. Protests were filed, however, by several property owners in the immediate vicinity, contending that the line depreciated the value of their property. These protests and the arguments, together with complaints from the city regarding vacation of certain streets and alleys, were heard by the Railroad Commission. The company supported its argument by presenting aerial photographs. A considerable number of these were taken showing the exact location of the contemplated approach to the city. The accompanying illustration showing one of these photographs indicates clearly the position of the line around the bluff referred to in the article, the St. Paul tracks, the Menominee River, and the valley or low lands. Proof was offered and substantiated by this photograph that the line did not vacate streets and alleys. The photograph did this better than would a map.

The Readers' Forum

Annual Maintenance Number Commended

CINCINNATI STREET RAILWAY

CINCINNATI, OHIO, April 7, 1926.

To the Editor:

The JOURNAL is to be congratulated on its enterprise in publishing the Annual Maintenance Number. More and more street railway operators are getting the idea that more consideration must be paid to improved equipment and devices used thereon and the presentation by the JOURNAL of what the maintenance men are doing to invite this attention on the part of operators is praiseworthy from the point of view of both the operator and the manufacturer. WALTER A. DRAPER,
President.

SAN ANTONIO PUBLIC SERVICE COMPANY

SAN ANTONIO, TEX., April 9, 1926.

To the Editor:

I am very much pleased to see the type of discussion which you have included in your Annual Maintenance Number of the ELECTRIC RAILWAY JOURNAL, March 20.

Often different departments of a company develop along individualistic lines, with resulting lack of co-operation between the departments. There is one common ground which should be a cardinal principle in every department, and that is the effort to sell more rides to help make the company as a whole successful.

There are so many things that can be done in each department to increase the popularity of public transportation service that no department need lack opportunities for work in this direction. With a common aim it is quite natural that co-operation between the departments must follow. This results in co-ordinated effort by the company as a whole and an *esprit de corps* that will win. W. W. HOLDEN.
Manager Traction Department.

Would Act as Token Clearing House

PHILADELPHIA, PA., April 7, 1926.

To the Editor:

For two dollars ($2) per member per month I will act as clearing house for electric railway tokens, furnishing daily or weekly statements as required. I am a responsible property owner and can furnish bond.

The tokens could be sent to me by mail or direct to the owning company and a statement sent to me. There would be no necessity for my handling any money, as all transactions would, of course, be on a credit and debit basis. JAMES F. SHERION, JR.

Superiority of Straight-Line Operation

MOUNT VERNON, N. Y., April 3, 1926.

To the Editor:

In discussing Mr. Storrs' paper at the recent meeting of the Metropolitan Section I made reference to a London test which showed the superiority of straight-line operation to weaving in and out. The test is mentioned in "Some Aspects of Metropolitan Road and Rail Transit," a paper by H. H. Gordon, then member London County Council, read Nov. 25, 1919, and published in 1919 *Transactions* of the (British) Institution of Civil Engineers.

The test was conducted Thursday, July 16, 1914, between 8 a.m. and 8 p.m. on London Bridge, which has a carriage way of 37 ft., or enough for four lines of vehicles. There were then both "fast" and "slow" tracks, so to speak, for the traffic. Owing to failure of vehicles to keep in the assigned grooves, it was found that the bridge was congested, although used only to 41 per cent of its capacity.

Commenting on this, Mr. Gordon said:

> Watching the course of traffic shows why results fall so far short of theoretic conclusions. The assumption that vehicles follow each other in regular lines, with uniform but graduated speed in each, is far from being realized. Lumbering vehicles encroach on tracks reserved for fast traffic. For all kinds of inadequate reasons vehicles stop and cause congestion. . . . London traffic rarely proceeds in regular flow; most frequently in irregular spasms.
>
> To the traffic formula "Keep to the left" (the British rule) should be added the equally important injunction "Keep in line." If some easy method of marking the track longitudinally could be devised, and needless encroachment on more than one were made a breach of traffic regulations, a material increase in the carrying capacity of the existing highways would ensue.

While the foregoing is almost pre-automotive, the principle is there, and that's what counts.

WALTER JACKSON.

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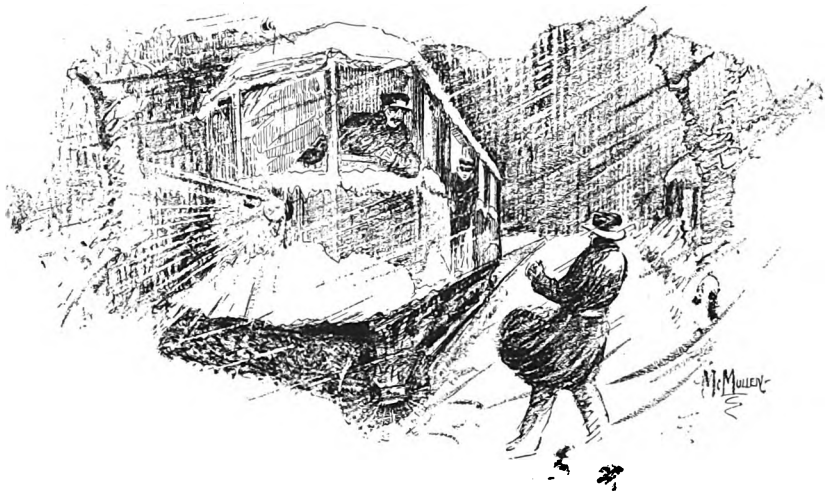
Dick Prescott Gets an Early Call

And a Cold Walk Through the Snow



DICK PRESCOTT, engineer of equipment of the Consolidated Railway & Light Company, awoke with a start one morning before daylight. For a moment he struggled to collect his befogged senses, while all the fire gongs in town seemed to be crashing in his ears. Then he finally realized that the telephone in the hall was ringing lustily.

Still half asleep, Dick stumbled to the insistent instrument and lifted the receiver hurriedly to stop the ringing before it awoke the entire family.

"Hello?" he questioned drowsily.

"Hello! That you, Dick?"

"Yes. Who in the world is this?"

"This is Steve White," answered his good friend the carpenter shop foreman. "It's been snowing to beat the band all night, Dick, and we're shorthanded here with a busted plow. You're fairly close to the shop and I wondered if you could get down to give us a hand."

"Sure I'll get down!" exclaimed the now thoroughly awake young engineer. "Any cars running on Fourth Street?"

"Don't know, Dick. Most of us have been up all night, but we've had our hands full here. She's snowing like the North Pole got lost."

"All right, Steve. I'll be along as soon as I can make it. See you later."

"Say," called Steve, as Dick was about to hang up. "Don't stop for any breakfast. We've got a coffee pot going here and lots of sandwiches."

Dick hurried into his clothes, found a pair of overshoes and quietly slipped out of the house. He looked at his watch and noticed that it was a quarter past three. A blast of wind-driven snow greeted him at the door and he sank to his knees as he stepped into a deep drift on the walk.

"Gee!" he exclaimed, glancing up and down the white-shrouded street. "This is a real storm!"

He tucked up his collar and made his way to the corner. A heavy bank on each side of the street showed that the sweepers had gone through, but the badly drifted tracks indicated that some time had elapsed since the line had been covered.

"Looks like it's getting the best of them," Dick muttered. "Guess I'd better hike it."

Keeping to the center of the street, he braced himself to the storm and started toward the shop. It was hard going, but he made progress. He warmed to the task and soon forgot the chill of the wind as he plodded his lonely way along the storm-blown, deserted street.

Suddenly, through the gloom ahead, a dim headlight faintly glowed and he could hear the tinkle of a snow-choked gong. He looked closer and could distinguish the ghost-like outline of a sweeper slowly making its way in a self-created cloud kicked up by its whirling brooms. When the sweeper came closer, Dick recognized in the figure hunched over the controller grizzly "Pop" Jones, veteran of many years with the Consolidated, now eagerly peering through his snow-smeared window, intent on his important task.

"Pretty bad night," called Dick above the swish of the brooms, at the same time waving his arm over his head.

"Howdy!" yelled Pop, stopping his car and leaning out to make himself heard. "What you doin' up so early, Dick?"

"Going down to give them a hand at the shop. How are things going?"

"Pretty good! We'll make it all right now if it don't come much harder. Just got out of the shop in time, though. Another half hour and she'd 'a' had us whipped on this line."

"What happened?"

"Burned out an armature. Say, you ought to have seen that gang at the shop put us back in commission! Better shake a leg, boy, they got a plow busted and they need help. They're workin' back there like hell broke loose. Got to keep goin', Dick, so long!"

Dick instinctively quickened his pace. He thrilled at the thought of taking an active part in this struggle against the elements—an unseen part, but vital nevertheless. As he approached the shop there ran through his mind the words of old Pop Jones: "They put us back in commission"—hours and fatigue forgotten in the job of keeping the lines open so that those who still slept comfortably would find convenient transportation in the morning.

"This is sure a game of teamwork," thought Dick. "That's the backbone of this idea of selling transportation. Few people will think of that gang at the shop, but they are entitled to a good share of the credit for keeping this line open tonight."

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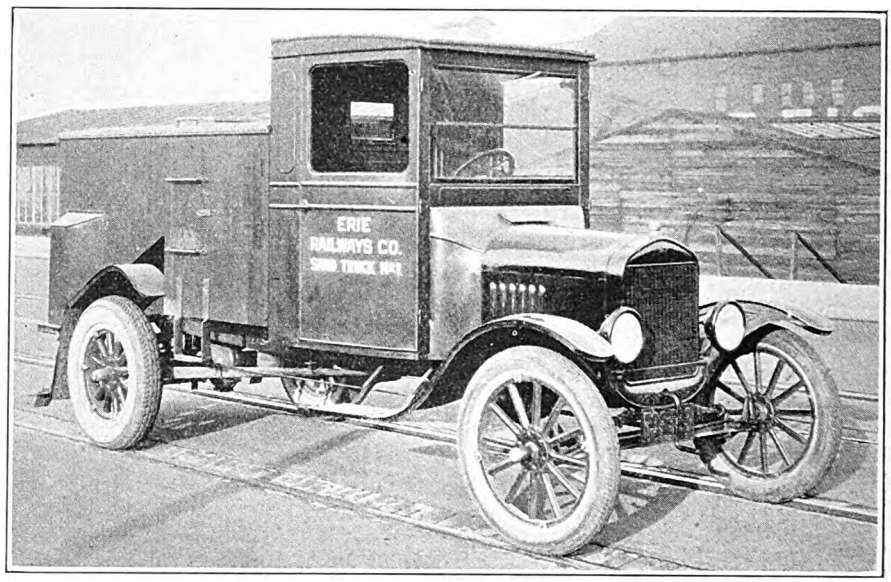
Maintenance Notes

Ford Truck Solves Sanding Problem in Erie

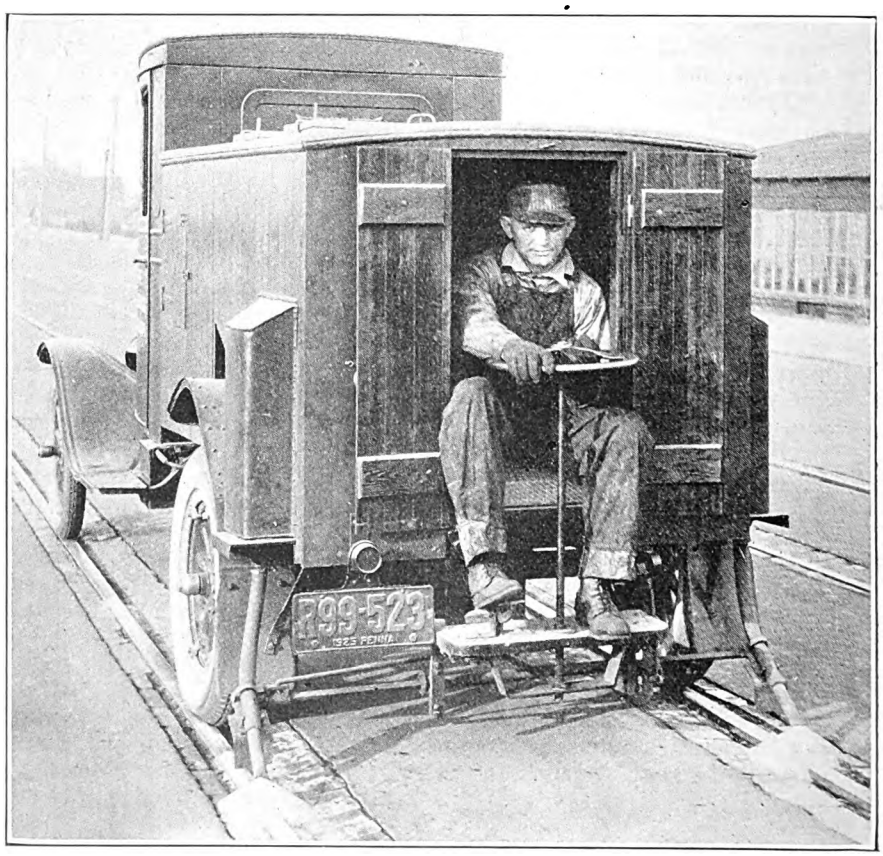
FOR sanding electric car tracks and also sanding the roadway where buses operate during icy or slippery weather, the Erie Railway, Erie, Pa., now uses a 1-ton Ford truck. The arrangement of bins for carrying sand and the mechanism for operating the sand valves and distributing the sand were built in the company's shops under the supervision of P. J. Wood, superintendent of equipment.

The sand hopper has a bottom constructed of No. 20 gage steel and this slopes at an angle of approximately 45 deg. from the back of the driver's cab to the rear end of the truck. At the rear a V-shaped compartment is constructed large enough for a man to sit in so as to direct the sanding and operate the sanding valves. An accompanying illustration shows the rear end of the truck with the operator in position. This illustration shows the truck on the car tracks, but in operation it is not necessary to follow the car track very closely, as the sanding hose on either side at the rear can be moved back and forth a distance of 18 in. on either side of the rails. This makes a very flexible arrangement. The sidewise movement of the sand hose is obtained by the operator turning a hand wheel mounted at the top of a vertical shaft. The lower end of the shaft has a bell-crank lever which attaches to a ¾-in. square sliding shaft. The ends of this square shaft have clamps which are attached to the two sanding hose. There are four bearings for the square shaft. Those at the end are supported from long hangers which reach back to the center framing. The two bearings on either side of the step are supported by strap hangers, which drop down from the step.

These bearings are also arranged so that the hose can be moved vertically. The square rod slides in a hole in a circular center part of the bearing. This bearing itself will also rotate inside its housing. This enables the two hose to be lifted up by moving a lever which can be seen at the right hand side of the step in the rear view of the truck. This raising of the hose is of particular convenience when returning along a route which has already been sanded or when cutting across from one line to another in a section where sanding is not required. With this flexible arrangement, it is easy for the operator to direct the sand hose



Sanding of Tracks and Roadways and the Salting of Switches Are Carried Out Most Efficiently in Erie, Pa., by This Truck



The Rear of the Sanding Truck Has a V-Shaped Compartment for the Operator, Who Directs the Sand to the Track by a Hand Wheel and Regulates the Flow by a Pedal

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so as to strike the rails during operation at the full speed of the truck. Sanding can thus be carried out very rapidly.

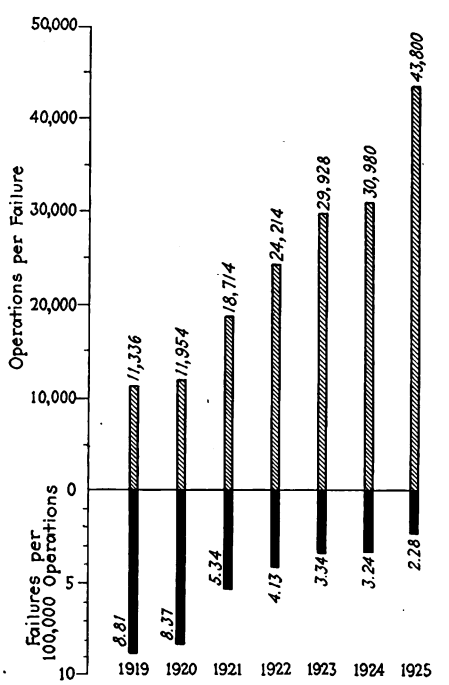
The hopper holds 1 cu.yd. of sand. The flow of sand into the sand hose is regulated by a slide on each side just at the top of the hose. Movement of the slide back and forth is governed by a pedal attached to the step. Pressure of the operator's foot causes more sand to flow, and by raising his foot the opening is reduced or shut off as desired. The operating mechanism for the slides consists of a bell-crank lever attached to the rear end of the pedal. This in turn is attached to two rods which hook into the ends of the slides. Both slides move in the same direction to open and in the reverse direction to close the opening. The hose used to receive the sand as it comes from the hopper is 1½ in. diameter. A wrought iron pipe is attached to the lower end of each hose. This is flattened out at the bottom end, so as to provide an opening ¼ in. wide. This construction is for sanding the track rail. When it is desired to sand a wide area, such as is necessary for operation of buses during slippery conditions, the two wrought iron pipes are replaced with a special nozzle. This is fanned out at the end to a distance of 6 in. on the inside and 12 in. on the outside, making the total width of the nozzles at the ends 18 in. In order to direct the flow of sand, the inside of the nozzle has louvres, so that the sand as it comes from the hose falls into these louvres and thus has a uniform distribution along the entire width of the nozzle. One-quarter inch square openings are provided for the sand to come out. This nozzle of course can be moved back and forth by turning the hand wheel in a manner similar to that described for track sanding and, by rapid operation, a considerable distance either side of the roadway will be sanded.

In the illustration showing the rear end of the truck two shields will be seen attached to the lower end of the sanding hose. These keep wheel wash from interfering with the flow of sand as it comes out of the nozzle. The V-shaped compartment at the end is provided with a seat for the workman and with two doors and a catch, so that this can be locked when not in use. The hand wheel can be lifted off and placed in the compartment, and this can also be used for keeping the workman's overalls and clothing. Buzzers and push buttons are installed at the side of the driver and also at the side of the operator. These are used for signaling, so that the driver can warn the operator when it is necessary for him to pull away from the track or to stop entirely. The operator can also signal the driver when necessary.

In addition to carrying sand for the tracks and roadway, this truck is also used for salting switches during severe weather conditions. A bin for salt is built underneath the back of the hopper. In salting switches, the salt can be removed by a shovel or a bucket can be filled and the salt then applied by the workman in the usual manner.

Signal Operation in Chattanooga Still Better

CAREFUL signal maintenance on the Tennessee Electric Power Company's lines at Chattanooga, Tenn., has resulted in a material reduction in failures, as is evidenced in the annual report of the signal department for 1925.



A Progressive Improvement in Signal Operation in Chattanooga Is Shown for the Years 1919-1925

In the accompanying table is given a list of the troubles.

In all the 42 Nachod signals in service there were but 49 cases of trouble, during which time the signals operated 2,146,200 times, which is at the rate of one interruption for each 43,800 movements. These signals are quite old, some having been installed seventeen years ago, and they have been in continuous service.

Trouble Found	1925	1924
Line wires	6	6
Fuses and storms	4	7
L mps out	5	10
Relay trouble	14	11
Setting contactors	6	5
Clearing contactors	4	1
Bad ground	6	7
Pole wiring	2	8
No trouble found	0	5
Miscellaneous	2	6
Total	49	66
Number of blocks in service	21	21
Total yearly operations of all signals	2,146,200	2,044,680
Number of operations per interruption	43,800	30,980
Average daily operation per block of signals	282	266
Average yearly operation per block of signals	102,200	97,746

An annual record of the signal operations has been published in the issues of ELECTRIC RAILWAY JOURNAL for March 19, 1921; March 18, 1922; Feb. 10, 1923; March 1, 1924; May 16, 1925.

The successive yearly betterment in the signal operation is shown by the graphs.

Wide Gaging Wheels in New Orleans

METHODS of changing a long section of track in New Orleans from 4-ft. 8½-in. to 5-ft. 2½-in. gage were given in an article in the issue of this paper for April 3. This change has been made as part of the policy of the New Orleans Public Service, Inc., to use a wide gage on all of the tracks of its system. Obviously, the change of track gage on part of the system meant a corresponding change of wheel gage on a considerable number of the cars of the company. This work has been conducted in the repair shop. It did not have to be completed in so short a time as the change of a section of track, which had to be done overnight.

For years the New Orleans system has had tracks of two gages, and still uses the narrower gage track on one important line. Consequently, some of its cars have standard-gage and some wide-gage trucks.

When the change of track gage became imminent, a certain number of standard-gage cars were designated for change of gage. No change had to be made in the truck frame because it was wide enough to accommodate the wide-gage wheels. In consequence, the same axle was used, and the only work necessary was to move the wheels farther apart and to move the brake rigging, including the hangers and brakeshoes. As this change has been expected for a number of years the wheel seats on the axles were wide enough to permit spreading the wheels.

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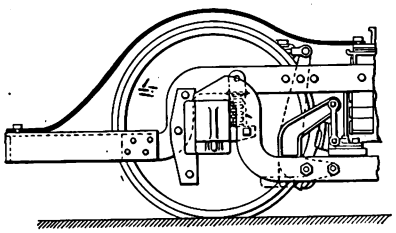
Mud Guard Protects Resistors

PROTECTION of the resistance grids and the air compressor from injurious mud splashing has been secured on certain cars of the Public Service Railway, Newark, N. J., by means of an ingenious



Home-Made Mud Guard Fastened to Truck Frame Protects Resistance Grid from Splash

guard. The type of truck on which this device is used is the Standard 0-50. A piece of 6-in. flat iron was welded between two 1-in. angle irons to form the guard. This was bent to a semi-circular shape to conform to the outer edge of the wheel. One end of the splasher is bolted to the end of the truck frame, while the other end is attached to the truck bolster. Approximately 2-in. clearance is allowed between the wheel and the guard. On account of this close fit there has been no difficulty with securing clearance under the car body frame.

Steel Frames Make Neat Car Signs

FOR announcements inside cars the Grand Rapids Railway, Grand Rapids, Mich., uses cardboard signs 8 in. x 25 in. in size, with a 1-in. border all around. An attractive holder is provided for the signs by using a sheet-steel frame with a slot at the top for inserting the card. The frame is made of 1¾-in. steel

Announcements Inside Cars of the Grand Rapids Railway Are Held in Neat Sheet Steel Frames

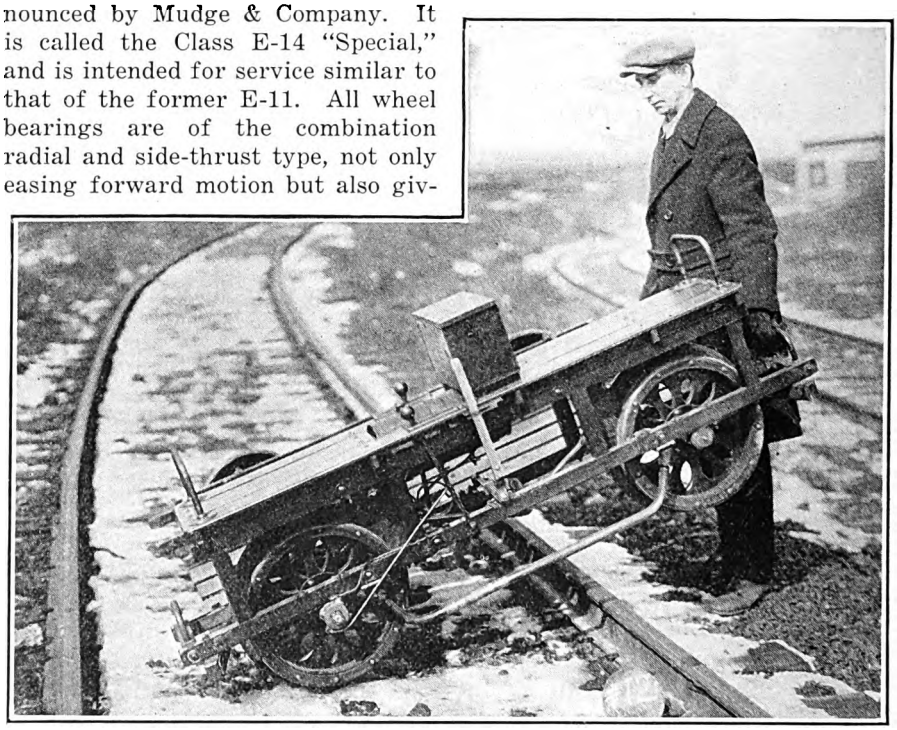
stock which is bent to form the two sides each ¾ in. wide. The sides and ends are welded together.

Two eyes are riveted to the top corners. These are placed over hooks in the center of the headlining inside a car, so that two signs can be read from either side.

New Equipment Available

Light Inspection Car Has Roller Bearings

AN IMPROVED light-weight car for inspection and light repair work on interurban lines, and equipped with roller bearings throughout, has recently been announced by Mudge & Company. It is called the Class E-14 "Special," and is intended for service similar to that of the former E-11. All wheel bearings are of the combination radial and side-thrust type, not only easing forward motion but also giving roller-bearing protection against side sways of the car. Thus the 4-hp. Mudge Class E engine is able to deliver additional power because of the decided reduction that has been made in friction.



Lightness and Reduction in Friction by Use of Roller Bearings Are Features of This Handy Inspection Car

Two decided improvements have been made in the interests of safety. The car is so designed as to permit placing the tool tray on the side of the frame immediately next to the guide wheels, giving the car an additional balance which was lacking in former cars of this type. Moreover, the wheels have been placed at an angle rather than in parallel planes, so that as the car advances on the rails the wheels tend to hug the sides and to hold the car down. The faster the car travels the stronger the downward pull.

Self-equalizing brakes, acting on both drive wheels, are used. These brakes automatically adjust themselves for wear, so that the braking action is always equal on both brakes. Improvement has been made in the brake lock. It is not necessary to chuck a rock or piece of wood under the wheels when the operator leaves the car temporarily to do his work. He needs only to pull back the brake and place the brake lever in the notch, locking it securely and preventing the car from traveling.

Skids and iron handles on both ends of the car are provided as standard equipment to facilitate removal from the rails. The car can be quickly rolled aside by the operator by taking hold of either end, so that in an emergency he can work rapidly.

Welded-in Bushings for Half-Ball Hangers

HARDENED steel bushings welded to the hanger holder castings of the half-ball type of brake hanger are now being furnished by the J. G. Brill Company, Philadelphia, Pa. These bushings are made of No. 14 gage steel, specially hardened. They are manufactured to fit tightly into the hanger holder castings and shoe holders, in which they are held by a special half-ball clamp while they are being spot welded at four points on the edge of the bushing and casting. This change from previous designs was

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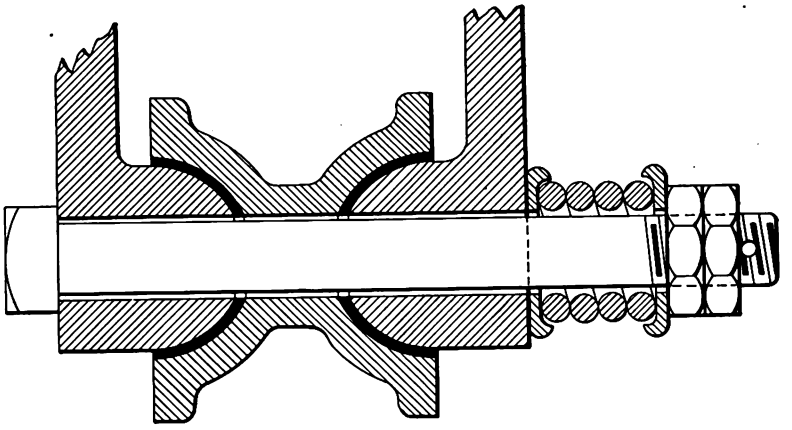


Hardened Steel Bushings Spot Welded to Hanger Holder Casting

made so that the bushing in the socket will take the wear and when desired may be replaced readily at a minimum expense rather than to require the scrapping of the whole hanger holder casting or shoe holder. This type of construction should result in consistently effective performance in addition to reducing maintenance cost.

First Single-Motor Gas-Electric Bus

WHILE several innovations in gas-electric bus design were made by the International Motor Company in placing its first gas-electric Mack bus on the market, many of the standard features in design of the city type bus are retained completely in the new gas-electric unit. Important among these is the standard Mack rear axle, which is retained because the single driving motor is coupled directly to the drive shaft. Previously, all gas-electric buses developed and marketed commercially have been equipped with twin driving motors, one driving each of the rear wheels.

The features of the new equipment are the elimination of considerable weight and the retention of a single propeller shaft. The manufacturers state it to be their belief that material reductions in maintenance costs will be effected through the simplification of the power plant and the driving equipment. The emergency brake lever has been eliminated as unnecessary and the operation of the emergency brake has been transferred to a foot pedal.

Electrical equipment for the new bus is manufactured by the General Electric Company. It consists of a DT-1105 generator, rated at 125 volts, 200 amp. at 1,200 r.p.m., a G.E. 1101 motor rated at 125 volts, 140 amp. at 1,100 r.p.m., and a street car type controller, consisting of a drum type switch to give proper connections for forward and reverse and for emergency electric braking. The generator is self-excited by a shunt winding, also by a small series winding so connected that as the load increases the field strength is automatically kept up and the desired operating characteristics are thus maintained.

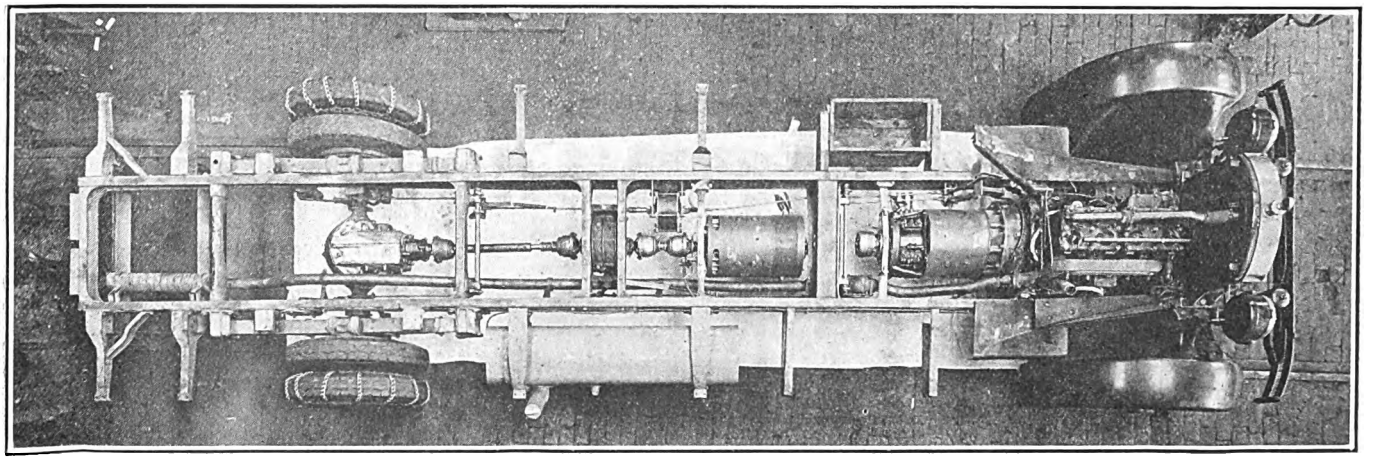
There is also a small field winding on a separate circuit from the main winding. This is fed from a 12-volt starting battery, taking less than 1 amp., its function being to provide a small initial excitation so that when the throttle is opened suddenly the generator will instantly respond.

The added weight of the electric unit over the standard parts which they replace is stated to be approximately 1,400 lb., making the weight of the 25-passenger bus empty 11,300 lb., and the 29-passenger empty 12,130 lb.

As the generator in the Mack gas-electric bus occupies the place of the transmission in the gear-drive unit, the hand brake lever is dispensed with and the right pedal, formerly the service brake, is connected to the emergency brake on the propeller shaft. This propeller shaft brake in the bus operates independently of the service brake, which acts on rear wheel drums.

Although the motor on the new bus has been so installed that it does not protrude above the flooring of the unit, none of the ground clearance has been lost. The clearance is 9½ in., identical with that in the standard gasoline bus. The value of ample clearance in buses has been demonstrated where buses have operated during heavy snowfalls. Units provided with high clearance proved generally satisfactory in maintaining schedules during the winter.

The engine of the bus is mounted on rubber shock insulators in practically the same manner as the springs. The generator is supported by a cross-member attached to the frame by means of steel incased rubber blocks, while a single electric motor is supported at three points by shock insulators. This installation reduces to a minimum the shock of uneven roadbeds, reduces the vibration of fast-running engine and motor and deadens mechanical noise considerably. In general, the aim of Mack engineers has been to adapt the gas-electric principle to standard equipment rather than to develop an entirely new bus throughout.



Placing a Single Motor on the Driveshaft Has Made It Possible to Retain the Standard Mack Rear Axle

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Association News & Discussions

Making the Utility Man a Better Public Servant

At Galveston Convention of Southwestern Public Service Association Many Topics for Improving Operation and Gaining Good Will Were Discussed

PROGRESSIVENESS and a desire to perform better the duties of a public servant permeated the proceedings of the Galveston convention. In that city were assembled delegates from the many companies in the great Southwest forming the joint annual convention of the Southwestern Public Service Association and the Southwestern geographic division of the National Electric Light Association. This was the 31st annual meeting of the former and the sixth annual meeting of this N.E.L.A. Division.

Of outstanding interest to the railway delegates and visitors was the extent to which the women of the industry have been brought into the service of the utilities in helping to put across the companies' message, selling securities and establishing that good will so fundamental in public relations work. The talks and demonstrations by the women delegates of the utility companies were an open invitation to the railway fraternity to follow a good example.

Merchandising transportation on railway cars occupied an entire afternoon under the leadership of Chairman W. W. Holden, superintendent of transportation, San Antonio Public Service Company, San Antonio, Tex. George H. Clifford, Southwestern district manager Stone & Webster, in a paper on methods of encouraging car riding, gave as his belief that the time had passed when the railway manager need worry about the automobile situation. Street limitations and traffic congestion are now the limiting factors and the riding throughout the country is having a tendency upward. It probably will continue despite the increasing number of automobiles sold. In fact, the riding habit thus developed furnishes the greatest field for increasing business. Mr. Clifford laid great stress on the necessity of providing means of limiting street congestion and obtaining greater speed of cars and buses as being of basic importance in the building of traffic. Real estate owners are beginning to realize the importance of faster transportation as a definite element that concerns their operations.

Buses Build New Business

Proper use of buses by railway operators is also an important element of building new business. He gave it as his opinion that many of the old prejudices, such as the popular idea that railways congest the streets and that the traffic and parking regulations are desired for the selfish success of the street railways, must be broken down by showing that the cars not only serve the masses but serve them more efficiently than any other means of transportation known today.

H. B. Flowers, president New Orleans Public Service, Inc., in discussing this subject gave his views in one of the shortest talks of the convention. He said the details were not important as compared with the knowledge that the street car, once the fastest means of street transportation, was now the slowest. Today we must either scratch gravel or quit. However severe the jolt may be, he believes it will redound to the ultimate good of the industry. It should be perfectly possible to evolve a system of street car and bus transportation that will be the fastest means. Cars and buses must not only accelerate quicker but must travel at higher speeds than private cars. Easy-riding cars and comfortable seats, as well as a smooth track, are necessary not only to accomplish this greater speed but as a means of winning the traffic in competition with the private automobile.

Walter H. Burke, local manager Northern Texas Traction Company, Fort Worth, spoke against the boulevard system of stops when the boulevard is a street used by electric cars. In Fort Worth it was found better to establish this arrangement on streets adjoining the railway streets.

Know the Facts, Says Frank Coates

Frank R. Coates, president American Electric Railway Association, discussed the question, saying that it was of great importance that transportation men know the facts of the industry and use them correctly in the public talks given before the local communities. Many skeleton talks were being prepared by the A.E.R.A. for use of member companies.

As rolling stock plays an important part in the selling of transportation many equipment men told of the practices of their local companies. Among these men were F. J. Bennett, Houston, Tex.; C. O. Rushing, Shreveport, La.; and H. C. Pressler, Beaumont, Tex.

Likewise the preparation of schedules is also important in this connection, as told by T. A. Owens, Dallas, Tex., and W. R. Castle, San Antonio, Tex.

Tom P. Walker, local manager El Paso Electric Railway, spoke of personality as being the complement to good service. While composed of a multitude of little things, he said, this was a big factor in itself. Good will, courtesy, humanity, the promotion of safety and a smile were the important elements of this intangible quality.

Dallas Publicity Methods

C. J. Crampton, manager publicity department Dallas Railway, gave many details of the practices of his company. All stories of accidents are given promptly to the newspapers, as are also all items and stories of news. The background of publicity is the newspaper. He finds it of far greater value than

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 21—Central Electric Traffic Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 22—Central Electric Railway Accountants' Association, special meeting, Keenan Hotel, Fort Wayne, Ind., 9 a.m.

April 21-23 — American Welding Society, annual meeting, Engineering Societies Building, 29 West 39th Street, New York City.

April 23—Metropolitan Section, American Institute of Electrical Engineers, Engineering Societies Building, New York City, 8 p.m.

April 30—National Highway Traffic Association, annual meeting, Automobile Club of America, New York City.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26 — New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

August 12-13 — Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

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spreading advertising over a wide range of small-circulation or one-time publications. The radio is another means of creating a wider knowledge of publicity material. His department was characterized by himself as a small lyceum for the furnishing of public speakers for all occasions.

Of outstanding importance has been the work of the Junior Safety Council among school children of lower than high school grade. Juvenile accidents have practically been eliminated due to the activities of this group of school children. The public relations department cannot do it all. Every employee is invited to send in advertising suggestions. Five dollars is paid for each suggestion used and the employee's name appears signed to each advertisement published.

James P. Griffin, vice-president Texas Electric Railway, Dallas, spoke of the importance of adjusting rates to fit all conditions. A special party of any number may now have a private car on a tariff constructed to meet different sized parties. Tickets have been placed on sale at colleges and excellent results have thus been obtained. An advertising council has been formed on this property that will aid in the expenditure of double last year's appropriation. Newspapers, billboards and other means of publicity are being used.

CUSTOMER AND EMPLOYEE OWNERSHIP COMMENDED

During the joint session Wednesday morning Ralph S. Child of Bonbright & Company delivered a paper on public utility financing, in which he commended the activities of public utilities in the sale of stock to employees and customers. In 1925 the billion and a half dollars of utility financing was twice that of three years ago and a third of all money raised for corporate financing. In discussing the basis of utility financing, Mr. Child made a plea for sound economic study and the preparation of tentative budgets five to ten years in advance of actual requirements. Investment bankers look with disfavor on financing utilities of any kind into competitive territories.

One of the most interesting features of the railway section meeting was the discussion of traffic by police officials of eight cities in the Southwestern district. Stanley Good, captain of traffic, El Paso, made a plea for closer co-operation with railway officials. Elimination of parking was stated by Captain Good as well as other police officials who followed him as being the most important element of the traffic problem. Since the cars were the largest public servants, the police officials in the performance of their duty to the public must move the cars quickly, even at the expense of the private automobile. There is no question but that the traffic officials of the Southwestern cities are making great strides in the solution of this difficulty.

James W. Welsh, executive secretary American Electric Railway Association, talked on bus operation and the ways that this vehicle can serve the railways.

Traffic regulation in Chicago and other cities, with particular reference to control signal, was discussed by Claude Van Auken of Chicago and John Dewhurst of New York.

Harold E. Broten, vice-president Mineral Wells Electric Company, was elected president of the Southwestern Public Service Association, and W. H. Burke, general manager Northern Texas Traction Company, was elected chairman of the railway section.

The total attendance of both associations was 572, the largest ever at a meeting of the combined bodies.

C.E.R.A. Announces Plans for Boat Trip

SUB-COMMITTEES for the annual meeting have been announced by President G. K. Jeffries of the Central Electric Railway Association. These include the hotel and arrangements committee and sub-committees for the principal cities in the territory. The list follows:

Hotel and Arrangements—J. H. Drew, chairman; John Benham, J. A. Donahey, L. P. Morris, C. C. Creighton, C. L. Van Auken, E. S. Gunn, Charles Gordon.

Sub-committees: Cleveland-Akron—R. W. Emerson, chairman; F. H. Wilson, L. G. Tighe, Frank Campbell, W. F. Healy, R. C. Snell, J. H. Walker.

Detroit—W. S. Rodger, chairman; E. J. Smith, A. H. Ferrandou, Dean MacLaughlin.

Chicago—L. E. Gould, chairman; O. A. Broten, C. F. Dougall, R. R. Holden, R. J. Deneen.

Cincinnati—J. B. Stewart, Jr., chairman; A. G. Olberding, A. L. Kasemier.

Dayton—J. H. McClure, chairman; T. A. Ferneding, J. R. Johnston, W. B. Fincher.

Indianapolis—L. M. Brown, chairman; T. H. Nichol, W. F. Graves, W. D. Hamer, T. H. David, H. E. Rassmussen.

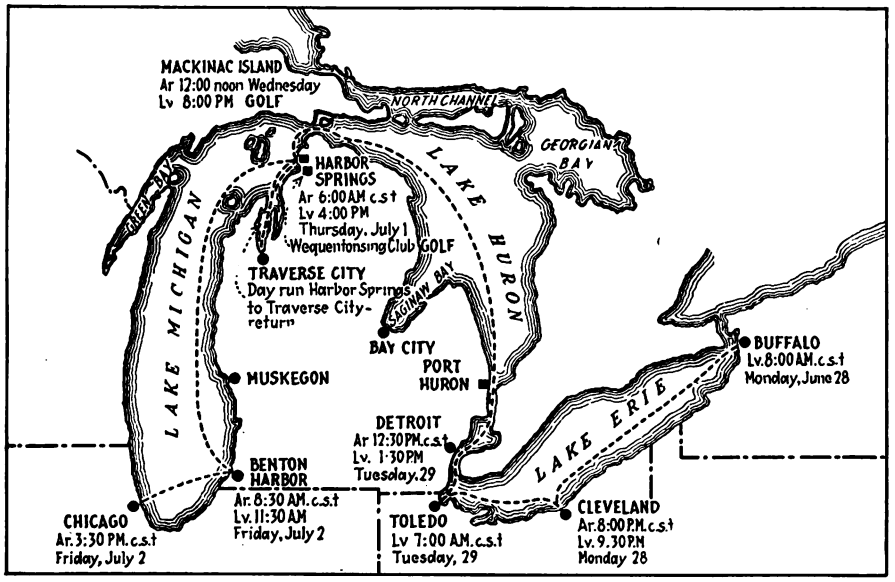
Sandusky - Toledo — M. A. Ackerman, chairman; J. F. Johnson, C. T. DeHore, H. O. Kelley.

Pittsburgh—C. D. Smith, chairman; W. H. Boyce, M. B. Lambert, H. W. Kilkenny.

Columbus—Lawrence Wilcox, chairman; C. C. Slater, A. F. Van Deinse.

St. Louis—G. L. Kippenberger, S. W. Crawford.

Several slight changes have been made in the schedule of the trip from that published in this paper for March 13. The new itinerary is being sent out in the form of a map, a reproduction of which is shown on this page. Central standard time is used throughout this trip.



Itinerary of C.E.R.A. Boat Trip. Note that Central Time Is Used

Engineers Needed for Executive Positions

Technical Education Is Valuable to the Modern Business Administrator—Qualifications for Engineer Executive Outlined

ENGINEERING is the most important new factor which has been introduced into our everyday life during the past 50 years, and it seems reasonable to believe that a substantial majority of the successful business executives of the future will come from the ranks of those who have had technical training. This was the consensus of opinion expressed by the speakers at a joint meeting of the Metropolitan Sections of the four Founder Societies before an audience that filled the large auditorium of the Engineering Societies building in New York City on the evening of April 14.

The speakers were E. M. Herr, president Westinghouse Electric & Manufacturing Company; H. A. Guess, vice-president American Smelting & Refining Company; Dr. F. B. Jewett, vice-president American Telephone & Telegraph Company, and J. C. Parker, vice-president and chief engineer Brooklyn Edison Company.

All agreed that the qualifications for a good executive include the ability to lead and direct, initiative, energy, courage and knowledge of the human side of business. These qualifications must be inborn and cannot be instilled solely by education. They can, however, be developed and strengthened by this means. Engineering education should give the student thorough knowledge of the fundamentals and should include also study of the humanities.

Describing the qualifications which the engineer should have, Mr. Herr mentioned the ability to lead and direct others, decision and initiative, the ability to evaluate men and materials, the willingness to assume responsibility and the ability to make economic decisions. He emphasized particularly that the engineer should not neglect cultural studies, as the human side of

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business is just as important as the technical side. In addition to the cultural studies and humanities, an engineering education should include a thorough study of the fundamentals and some attention to the principles of special industries.

Prefacing his remarks by the statement that they applied particularly to mining and metallurgical engineering, Mr. Guess said that the apparently greater number of lawyers and business men occupying executive positions might be accounted for by the fact that the total number of such professional men is greater than the number of engineers. In his opinion, the engineering profession is filling its proportionate share of executive positions. His ideas of the qualifications which an engineer should possess coincide closely with those of Mr. Herr. He, too, believed that these qualities must be inborn to a large extent. Detailed study of particular engineering subjects need not be included in the educational program of the engineer, but he should get sufficient information along these lines to enable him to earn a living.

Specialization in technical work in the past has kept many good engineers out of executive positions, according to Dr. Jewett. In the future, however, he believes that this tendency will be less marked and that the successful executives will be drawn in a large measure from the ranks of those who have had engineering training. He stressed the necessity of making a conscious effort to seek out promising men for future selection as executives.

The first qualification for an engineer as an executive is that he be a good engineer, Mr. Parker said. Knowledge of the fundamentals is essential, but too great a knowledge of detail is likely to be a disadvantage rather than an advantage. He spoke of the danger of becoming so absorbed in the technique of engineering that the real reasons for doing the job were forgotten. Consideration of the human side of industry is highly important, he said. Most men respond in the spirit in which they are approached, and it is essential that the executive have a good working knowledge of the human side of business.

Wire and Sheet Metal Gages to Be Unified

ELIMINATION of the confusion caused by 30 wire and sheet metal gage systems now in use in this country is to be brought about as the result of a conference held on March 18 in New York City, and attended by representatives of 25 organizations, including the A.E.R.A., interested in all phases of the subject, which includes wires, sheets and tubes of metals of all kinds. Unanimous decision was reached that the confusion brought about by the existence of the numerous conflicting gage systems has become intolerable, and that industrial practice should be unified in a simple consistent plan. The detailed technical work will be in the hands of a sectional committee broadly representing all interested industrial groups and working under the American Engineering Standards Committee.

The trend of opinion at the conference strongly favored the elimination of all gage numbers and the use of a simple system of designating sizes in decimals of an inch. The decision, however, on the exact form of the solution was left to the sectional committee, the scope of whose work was outlined as follows:

The standardization of a method of designating the diameter of metal and metal-alloy wire, the thickness of metals and metal alloys in sheet, plate and strip form and wall thickness of tubing, piping and casing made of these materials; and the establishment of a standard series, or standard series, of nominal sizes and of tolerances for wires, sheets, plates and strips.

American Association News

Traffic Congestion

POINTS to be covered in the final report of the committee on traffic congestion were discused at a meeting held on April 2 at Cleveland, Ohio. It was suggested that this final report should contain (a) excerpts from the report of the National Conference on Street and Highway Safety; (b) portions of the report of the 1925 committee on traffic congestion, and (c) the model traffic ordinance adopted several years ago by the committee on code of traffic principles.

A sub-committee consisting of A. J. Fink, R. W. Emerson and C. H. Evenson was appointed to analyze the report of the National Conference on Street and Highway Safety.

Progress was reported in the matter of department store checks to determine the means of transportation used by customers in reaching the stores. It has developed, however, that some stores object to making such a check on account of the comparatively small number of patrons using automobiles.

Toledo, Ohio, was selected for the next meeting, to be held June 4. Those present were C. D. Smith, A. J. Fink, E. S. Rider, R. W. Emerson, J. A. Greig, J. P. Tretton, P. E. Wilson, sponsor, and A. R. Myers, chairman.

Power Generation

REVIEW of the work of its subcommittees was made at the meeting of the power generation and conversion committee of the Engineering Association, held on April 1-2 at association headquarters in New York City. The committee's report this year will be divided into four sections. First, will be a review of existing manual substations; second, existing practices in design and operation of automatic substations, including remote and supervisory control. The third subject is the application, characteristics and present status of the mercury arc power rectifier; and the fourth and final section of the report will be on the ventilation and reduction of noise of automatic substations.

Members present at the two-day meeting were L. D. Bale, superintendent of power Cleveland Railway, chairman; W. E. Bryan, St. Louis; F. W. Peters, Schenectady; G. I. Wright, Chicago; W. C. Dixon representing C. A. Butcher, East Pittsburgh; T. Blommers, Pittsburgh; G. Solberg, Schenectady; F. R. Kelley, Pittsburgh; J. K. Keller, Pittsburgh; H. W. Codding, Newark, N. J.; C. L. Gerhardt representing G. W. Saathoff, New York; C. E. Bennett, Atlanta. O. Naet and O. K. Marti, American Brown Boveri Electric Corporation.

Arc Welding Processes

AT A meeting at association headquarters in New York City on April 9 special committee No. 6 of the way and structures committee discussed methods for utilizing arc welding for repairs to rails and to manganese steel. In 1925 a similar committee studied this question and also welding wire specifications. A set of rules was compiled representing what was thought to be the best modern practice. These rules were submitted at that time for information only.

This year it is proposed to continue the investigation. In connection with welding wire specifications the information obtained in 1925 showed that the only recognized standard specifications were those of the American Welding Society. It is planned to make a further study of the subject in an effort to secure data which will permit the committee to prepare a satisfactory specification for wire for railway track welding purposes. It was decided to work on the basis of five classes of welding steel: (1) Low carbon, not over six-hundredths of 1 per cent. (2) Low carbon, fifteen-hundredths to twenty-hundredths of 1 per cent. (3) High carbon. (4) Managanese. (5) Coated.

Those present at the meeting were A. L. Donnelly, H. H. Dartt, E. L. Lockman, R. B. Fehr and C. F. Gailor, chairman.

Special Reports Available

FOLLOWING is a list of special reports that have been prepared by the Bureau of Information and Service of the American Electric Railway Association and are available to member companies upon request:

Bulletin No. 73. Working Conditions of Electric Railway Trainmen. A tabulation showing the hours of labor, length and types of run, proportion of straight and swing runs, overtime rates, extra compensation allowed for special types of work, labor turnover, etc., for some 250 operating companies.

Bulletin No. 74. Electric Railways Operating Motor Bus Lines. A newly revised list of companies operating motor bus lines including some 325 companies and showing for each company the number of miles of bus route, number, type and seating capacity of buses, fare chart, transfer privileges, etc.

Bulletin No. 75. Relief from Paving Burdens. This is a supplement to Bulletin No. 52, issued Nov. 1, 1925. It contains a review of cases occurring since that time, in which street railways have been relieved of their paving burdens. It also contains a brief summary of cases now pending, in which application has been made for relief from paving operations.

In addition to the above, supplements to the Fare Bulletin, Wage Bulletin, Bus Wage Bulletin and Cost of Living Studies (Bulletin No. 76) have been prepared, bringing them down to date.

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The News of the Industry

Increase in Pay for San Francisco Municipal Men Suggested

An increase in pay for trainmen of the San Francisco Municipal Railway, San Francisco, Cal., has been recommended by the Board of Supervisors. Final action on the matter is now up to the works board, which has already indicated its approval.

Under the resolution passed at a recent meeting of the supervisors an increase of 40 cents a day was recommended. The men had asked for 60 cents. This additional 20 cents has been promised the men as soon as funds become available.

The 40-cent increase will bring the men's pay up to $5.80 for an eight-hour day.

The Supervisors suggest a $2,000,000 bond issue to replenish funds that will be used up by the new pay scale. This money would be used for extensions and upkeep. It is also proposed to abolish the present depreciation fund, which now gets 18 per cent of the net annual revenues. In its stead it is proposed to create a 3 per cent depreciation fund, to be so designated that it can be used only for depreciation. Heretofore sums have been diverted from this fund for purposes other than those for which it was originally set up.

The resolution concerning the bond issue provides that $1,000,000 of bonds be sold at once to carry out the proposed program of extensions and that the second $1,000,000 be held practically as a depreciation fund asset to be sold when needed for purposes of a depreciation fund.

$1,450,000 Improvement Program for Dallas

The Dallas Railway, Dallas, Tex., has formally accepted the terms of an ordinance passed on April 7 by the City Commission. The new grant raises the cash fare from 6 cents to 7 cents and provides for the sale of five tokens for 30 cents. The half fare for children between five and twelve years of age remains at 3 cents, as does the half fare token issued to school students under seventeen years of age. The new fare ordinance requires that the company raise and expend $1,450,000 for replacements, improvements and extensions which are specified. Of this amount, $1,000,000 in new money must be raised and placed to the credit of the company before the ordinance becomes effective.

The Dallas Railway has been operating under a franchise granted on Jan. 8, 1917, wherein a 5-cent cash fare was stipulated. This franchise was later amended to permit the charge of a 6-cent cash fare for a limited period, conditional on the company's carrying out certain improvements and extensions named by the city. Three different fare extensions were made, all for limited periods and conditional upon carrying out certain stipulated improvements. The company found itself unable to make all the required improvements and extensions and keep its property up with a 6-cent fare and filed application for a 7-cent cash fare for an indeterminate period. The present fare adjustment is for an indeterminate period. It represents compromises proposed by the Supervisor of Public Utilities.

The final passage and acceptance of this ordinance ends a fare controversy which has been pending for several months.

Amendments to Cleveland Grant Pass First Reading

April 12 saw the City Council of Cleveland, Ohio, approve on first reading the so-called Horr transportation report. If this report is finally sanctioned the Tayler grant, under which the Cleveland Railway operates, will be modified to permit the company to obtain new capital and make service extensions. The amendments, which contain these provisions, will come up for final action on April 26 according to the present program.

After much discussion the City Council defeated by a vote of eighteen to six amendments proposed by the street car union. The union had attempted to have included in the new railway franchise clauses which would recognize the American Federation of Labor and provide for arbitration of wages and disputes over matters of discipline. John J. Stanley, president of the Cleveland Railway, had emphatically declared that the company would reject any such amendments.

At a meeting of the street railway committee before the general session of the Council 150 motormen and conductors, a few with their children, packed the committee rooms. A sergeant and a squad of police were detailed to prevent any possible trouble.

At this meeting platform men appeared for the first time to heckle union leaders and urge passage of the Horr amendments and acceptance by the union of President Stanley's offer of a 5-cent-an-hour increase in wages. Mr. Stanley presented 380 new names on petitions asking passage of the Horr amendments. He presented 1,482 names the week before. Some men who spoke against the union leaders charged the union heads with playing the "same old game, year after year," and being responsible for the men being "hornswoggled" out of the 15-cent increase last year in the courts.

City Law Director Carl F. Shuler and his assistant, Alfred Clum, expressed the opinion that the union amendments in the present form were illegal.

Thirty-Year Control Bill for Boston Killed

The bill to extend the public control of the Boston Elevated Railway, Boston, Mass., for a period of 30 years was killed in the Massachusetts Legislature on April 14 by an overwhelming vote. There will be no further legislation this year affecting the financing or control of the Boston property.

At the first voting the bill scored a victory with the committee on metropolitan affairs and committee on street railways sitting jointly. The trustees of the railway were in favor of the Boston control bill. Recently, H. Ware Barnum, general counsel for the Board of Public Trustees, said that such an extension was necessary to economic financing as it gave an element of certainty to the investment. The Chamber of Commerce was of the opinion that it was for the best interest of the car riders and the community that public control of the Elevated should be maintained for at least 30 years more as this would pave the way to obtain capital and permit service to be improved.

Denies Motion to Dismiss Utica Fare Case

Chairman William A. Prendergast of the New York Public Service Commission denied on April 14 the motion of Corporation Counsel Clarence E. Williams of Utica to dismiss the petition of the New York State Railways for permission to increase fares in the Utica zone to a 10-cent cash fare and 7½-cent ticket fare.

Chairman Prendergast said that if the petition were dismissed the company would not be disqualified from filing a new petition immediately, and that in view of the completed examinations of the company's books by the commission's accountants and a spot check of the company's inventory by the commission's engineers now under way, it would be better to proceed to a conclusion of the case. Mr. Williams based his motion to dismiss the proceeding on the claim that the inventory and appraisal of the company's property submitted by H. C. Throop was not reliable, and that if a rate base is to be fixed it should be on the basis of a definite inventory, reliable and up to date. He further argued that the company had not taken into consideration any depreciation of its property. The accountant of the Public Service Commission who has had charge of the examination of the company's books presented his report, which showed a reduction of $52,000 in the gross income in four years from 1921 to 1925 over that set forth by the company, adding that much to the deficit claimed by the company.

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Dispute in Los Angeles Over Tunnel Use

A lively public discussion with an element of local politics injected has existed in Los Angeles, Cal., over a proposed rerouting of some of the street cars to the north section which involves the use of the North Broadway tunnel by the Los Angeles Railway.

Preparations for the construction of a new city hall as part of a civic center group on Spring Street would make operation of street cars through this section of Spring Street impossible. Main Street is used for street car operation, but as it would be practically impossible to route all north and southbound cars on the one street, the city officials proposed that car tracks be laid through the North Broadway tunnel. At the request of the city, the Los Angeles Railway applied for a temporary permit to lay such tracks and operate cars through the tunnel. The permit was granted and work started.

An application for a court injunction to prohibit the laying of tracks was filed by John W. Arnold, citizen and taxpayer, whose son, John E. Arnold, was a defeated candidate for election to the City Council at the last election. Before the injunction suit came to trial the construction of tracks had been practically completed.

Later, a suit was filed in intervention in the Arnold suit by Miss Madeline F. Wills asking for a permanent injunction restraining the railway from using the tunnel and a permanent injunction restraining the City Council from granting franchises to the street railway permitting tracks through the tunnel. City and Council officials have been in conference on a division of cost on the work, which is estimated at $550,000. The last move to straighten out the tangle was taken by the City Council when it filed a suit to quiet title to the Broadway tunnel property so that the city will have undisputed right to the land.

Bonding Plan at Detroit Disapproved

Some way will be found to purchase the new buses and cars needed by the Detroit Municipal Railway, Detroit, Mich., but the Detroit City Council has refused to grant the request of the Municipal Department of Street Railways for a $4,000,000 bond issue to be included in the new budget. It was intended that this sum should cover the purchase of 125 double-deck gas-electric buses and 150 street cars.

The Street Railway Commission based its request upon the recommendation of General Manager H. U. Wallace that $4,000,000 be supplied by a bond issue, to be augmented by $70,000 which the department was to furnish. This would have enabled the purchase of the needed equipment for cash at a saving of more than $379,000 compared with the terms offered by the manufacturers in their proposals to furnish the equipment on the seven-year payment plan.

It was explained by Councilmen in refusing to grant the request that because of the 7 per cent bonding limit in Detroit it had become necessary to raise by taxation $3,000,000 which ordinarily would have been obtained through bond issues. The Council expressed a favorable attitude toward public utility bonds or mortgage bonds and practically agreed to submit the necessary proposition to the people. Some of the Councilmen favored the time-payment plan.

At the meeting at which the equipment matter was discussed the Miller-Shorn plan of rapid transit on surface lines on Jefferson Avenue was taken up with reference to cutting down the number of street cars and adding buses. The additional street cars asked for by the D. S. R. are needed on other city lines and it is estimated that about 575 street cars now in use will have to be scrapped within a few years. Mr. Wallace expressed the opinion that sufficient service could not be given to the people of Detroit without the purchase of the 125 coaches and 150 street cars.

Governor Approves Acts on New York Transit Laws

Governor Smith of New York, on April 15, signed the reorganization bill under which the Transit Commission becomes the Metropolitan Division of the Public Service Commission and the terms of commissioners are made nine years. The terms of Transit Commissioners Harkness, McAneny and O'Ryan have now expired, but the Governor deferred appointment of their successors.

Wage Demands Presented by New York State Men

Demands for a new working and wage agreement for the year beginning May 1 have been sent to James F. Hamilton, president of the New York State Railways, by the union employees of Rochester, Syracuse and Utica. It is certain that the employees have asked for a wage increase, but the amount is not revealed. The railway is to ask for a renewal of the present contract.

It is likely that the Rochester men will demand a settlement independent of the unions of the two other cities. A fare increase granted in the Kodak City is the main basis on which the Rochester men make their appeal for a pay boost. The railway has applications before the Public Service Commission in Utica and Syracuse for a like fare advance, but it is not probable that action will be taken before May 1.

Gasoline Tax Bills in New York Probably Lost

All of the gasoline tax bills introduced in the Legislature have been sent to the rules committee, which has assumed charge of legislative steering in the Senate and Assembly. The bills are believed to be dead for this year. Milan E. Goodrich, the father of the gasoline tax measure of two years ago and introducer of one of the five bills of this year, has not given up hope that the Assembly rules committee may report out his bill before adjournment, but opinion seems to be that the rules committee will not take any chance with the measure.

South Americans Study U. S. Industry and Highways

Publishers and editors from Central and South America, Mexico and the West Indies arrived in Washington on April 7, where they met a similar group of representatives of the press from every part of the United States at the first Pan-American Congress of Journalists.

Following the Washington sessions of the congress, which terminated April 13, the 100 or more Latin American editors started on a tour by bus of the eastern and central parts of the United States. On this tour many of the great industrial plants of the country will be visited and an inspection made of highway development.

The gathering is considered the most important journalistic conference ever held in the New World. Twenty-one republics are represented. Welcomed by President Coolidge and addressed, among others, by Herbert Hoover, the congress organized the Pan-American Association of Journalists to perpetuate the movement toward international understanding through the press initiated at the present gathering.

The men in attendance at the session discussed the part of the press in maintaining understanding among the American nations and considered the various problems of newsgathering, advertising and editorial policy common to all journalistic enterprises.

Every facility is being provided on the bus tour to present to the visitors a manifestation of the warm sentiment existing here toward the other republics of the Western Hemisphere. The expenses have been met by citizens of the United States desirous of fostering good will and trade relations with Latin America. The trip will be in two parts. The first part, from April 14 to 22, includes a visit in the South, together with a five-day stop in New York City. The second part will include a tour west to Ohio and possibly Chicago.

Detroit's Right to Regulate Jitneys and Buses Confirmed

The Michigan Supreme Court has reversed the decision of the Wayne County Circuit Court and upheld the validity of the Detroit ordinance regulating jitney bus traffic on Detroit streets. The court ruled that the legislative department of the city of Detroit has determined that the ordinance is for the public's welfare and for the public good, and the ordinance was declared valid on these grounds. The Corporation Counsel's office will draw a reasonable ordinance regulating all public conveyances operating on the streets of Detroit, including jitneys, buses and taxis. The effect of the decision will be to give Detroit absolute control over its streets.

Cummins Bill Tabled

With the assurance that the Cummins bill (S. 1734) designed to regulate interstate bus operation will not be reported out of committee for the Senate's consideration, the prediction is made by Washington observers that no legislation of this nature will be passed during the present session of Congress.

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East Oakland Transportation Again Up for Discussion

The California Railroad Commission has taken under advisement a proposition by the city of Oakland to have the Southern Pacific give local transportation facilities to territory in East Oakland. It is desired to have the company complete a loop from the heart of the business section connecting with a line that runs from the Mole on the bay into East Oakland territory. The plan was first instituted in 1921, but hearing was delayed by mutual agreement until now.

J. E. Warren, chief of the passenger rate department of the Southern Pacific, who was a witness, said that the Key System was in the street car business and that the Southern Pacific was willing to let it handle all the East Bay local traffic. His company did not want to develop any local service unless it could be assured beforehand that it might expect a reasonable return on the investment. From surveys made he said the company felt that additional service such as was desired would be a net loss. Mr. Warren declared that there had been a marked decrease in patronage on the line into East Oakland in the last five years. He attributed this, in part, to the Key bus service. It was also pointed out at the hearing that the Key system now has an application before the commission for permission to operate a bus line between Oakland and Hayward, and that this service, if authorized, would do much to improve East Oakland transportation. Commissioner Decoto proposed that the two companies study interchange of transfers.

Seeks Higher Fare in Rome

The New York State Railways applied to the Public Service Commission on April 12 for authority to establish a new maximum rate of fare of at least three tickets for 25 cents and a cash fare of 10 cents in Rome in place of the 7-cent fare, which has been in existence since May 25, 1920. The company alleges that the 7-cent fare in Rome was authorized in 1920 upon condition of the company undertaking and completing certain improvements to its property in that city. These conditions, it alleges, were complied with at great expense. The company claims that at no time since the 7-cent fare was established has its earnings met the cost of operation in the city of Rome and that it is not now earning the same. The net operating deficit in 1925 was $6,914. The company claims that there is no reasonable ground upon which to base the hope or expectation that the Rome lines can be operated without a similar deficit in the future, and if service is to be continued in Rome the petition states that it is imperative relief be afforded by increased fare.

Ejecting Passengers Scored by Winnipeg Company

The Winnipeg Electric Railway, Winnipeg, Manitoba, Canada, recently sent to its motormen and conductors a bulletin which read as follows:

A child of tender years, a person of unsound mind, or a person in such a feeble or helpless condition as to be unable to take care of himself must not be ejected. If you are in doubt make no attempt to eject a passenger.

The company assures its employees that in this as in all other cases it is expected employees use their best judgment in the application of the rules laid down by the company.

Billboard Campaign at Providence

Two series of billboard posters were used by the United Electric Railways, Providence, R. I., at 48 locations in a campaign that extended from Jan. 12 to March 12. Eight of these were illuminated at night. The ads were placed on main highways leading in and out of Providence, where the heaviest private automobile traffic was known to exist. One of the most striking of the ads was located at the Providence end of Washington Bridge, where all auto traffic coming in to Providence from the East concentrates. Two others were placed on Broad Street, one of the busiest thoroughfares in the city, and two on the road to Narragansett at a point where an average of 2,000 cars an hour pass. Others were placed near manufacturing plants to call the attention of the workers using private autos to the advantages of going to and from work by trolley.

Since the first of the year, riding on the trolley lines has increased materially and consistently and the poster campaign is credited by railway officials with stimulating a portion, at least, of this increase.

Eight-Cent Railway and Bus Fare Sought for Pasadena

The California Railroad Commission recently took under consideration the application of the Pacific Electric Railway for an increase in railway and bus fares in the city of Pasadena, Cal., from 6 cents to 8 cents. At a former hearing the company was denied its 2-cent increase on the grounds that the commission lacked jurisdiction to rule on buses. Later a rehearing was granted and at this recent meeting Frank Karr, chief counsel and vice-president of the Pacific Electric Railway, argued that under the law creating the State Railroad Commission, a rate-fixing body of common carriers, it had control of buses.

The city of Pasadena will resist an increase in local street car and bus rates on the ground that the company can obtain a fair return on its investment by changes being made in the operation and routes of the buses. Those who have made a study of the local transportation system claim that the bus lines could be put on a paying basis if the routes were further apart. In Pasadena the routes are spaced one-quarter of a mile apart. It is said that although the buses show a deficit in Pasadena, the railway lines of the Pacific Electric are making money.

City Attorney Howard said that the city was not opposing commission jurisdiction, but that if the commission should assume jurisdiction over the buses the city would suggest the appointment of a committee to change and modify the Pasadena bus system.

Amalgamated Wants Certain Clauses in St. Louis Franchise

The Amalgamated Association hopes to have the new railway franchise for St. Louis, Mo., include a provision against the use of one-man cars. A bill providing against such cars was defeated at the last session of the Missouri Legislature. The carmen hope to include in the franchise a clause recognizing the right of the employees to organize. They want a form of franchise now in effect in Montreal, Canada, also a clause providing for compulsory arbitration of disputes over wages or working conditions, taking in the ideas expressed in the Watson-Parker bill now pending before the United States Senate.

Indifferent Indeed Would Be the Person Who Did Not React Favorably to These Billboard Messages

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Ten Cents Sought in Oneida

The New York State Railways on April 12 made application to the Public Service Commission for authority to establish a new rate of fare of at least three tickets for 25 cents and charge a 10-cent cash fare on its lines in the city of Oneida in place of the 7-cent fare which the company has been collecting since Feb. 7, 1923.

The company alleges that at no time since the increase to 7 cents has it earned its actual cost of operation. It further alleges that in 1923, 1924 and 1925 the net operating deficits ranged from $9,065 to $28,836, and that the actual gross loss ranged from $15,413 to $35,740. The company further alleges that in view of the long period of time during which the deficit has continued there is no reasonable ground upon which to base the hope that the lines in the city of Oneida can be operated without a similar or increased deficit in the future. It is therefore imperative, it claims, that relief be afforded in the form of an increased rate of fare.

Change in Ticket Collecting Method at Portland, Me.

The system of fare collection on the lines of the Cumberland County Power & Light Company, Portland, Me., will be changed on June 1. There will be no change in the amount of fare, but an alteration in type of tickets and in the kind of fare boxes used for their collection. Instead of the present ticket, which requires punching, strip tickets will be sold for the same price as the present tickets—40 cents. These strips will contain five tickets each, and when the fare is paid a ticket will be torn off and deposited in the new fare box, which is so arranged that it can take care of ticket as well as cash fares.

The object of the change is to facilitate the handling of fares and prevent the congestion that frequently results at the present time, particularly on the one-man cars, when an operator is required to punch several tickets in succession, and possibly also to stop and make change.

The company has purchased 120 Cleveland fare boxes to re-equip the system.

Storm Affects "Radial" Railways in Ontario

A severe storm swept over the Province of Ontario, Canada, on March 31 and April 1, damaging the hydro system and various electrical utilities in Toronto and a number of other centers. The damage to the provincial hydro system was estimated between $35,000 and $40,000. The "radial" railways in Toronto also were damaged. The Metropolitan, serving a thickly populated district, was the hardest hit when the collapse of a 12,000-volt line cut the service for many hours. In Weston, a suburb of Toronto, factories were obliged to close for three days through the disruption of the hydro service. Telephone and telegraph systems suffered a complete paralysis. Manufacturing plants closed down in Brantford, Guelph, Woodstock and Galt.

News Notes

Service Between Hartford and Springfield.—The Hartford & Springfield Street Railway, Warehouse Point, Conn., which is planning reorganization through a sale of its property during April, received an additional blow to its plans when the New England Transportation Company, bus subsidiary of the New Haven road, announced a bus service, effective April 18, between Hartford, Conn., and Springfield, Mass. The new service will run express exclusively between the two cities. Coaches of the 27-passenger type will be used, four of which will run regularly and two during rush periods or on other special occasions. The route will be along the east side of the Connecticut River. In the establishment of this new line is foreseen a natural tendency to draw all through fares from the Hartford & Springfield's bus route.

Proceedings Halted to Honor Mr. Maltbie.—The memory of William H. Maltbie, valuation counsel for the United Railways & Electric Company, Baltimore, and a member of Mayor Howard W. Jackson's Efficiency and Economy Commission, was honored before the Maryland Public Service Commission on April 9. Mr. Maltbie died several weeks ago. The memorial services were held following a hearing in which the United was interested. At the services lawyers for the company, including Edwin G. Baetjer; Clarence W. Miles, people's counsel, and the members of the commission spoke.

Temporary Fare Cut to Beaches.—D. W. Pontius, vice-president and general manager of the Pacific Electric Railway, Los Angeles, Cal., has announced a temporary summer special 50-cent excursion over the lines of the company to near-by beach resorts. The round-trip fare of 70 cents will be reduced to 50 cents and will continue in effect for several Sundays in order to determine the volume of business that may be developed by reason of the reduced fare. Special excursion fare tickets will be good for use only on the Sunday purchased. Whether the fare will apply throughout the summer depends on its providing sufficiently attractive to develop the traffic necessary to make it remunerative.

Pamphlet Tells of Stock Sale.—How the Philadelphia Rapid Transit Company, Philadelphia, Pa., secured applications from 50,000 car riders and employees for more than 20,000 shares of 7 per cent cumulative preferred stock is told in "A Million a Day for Ten Days," a twelve-page pamphlet with illustrations of the advertisements used in this campaign. The extent of the publicity used in the campaign is noted in the booklet where "ads" run in foreign language newspapers are reproduced. Car signs displayed on the dash, in subway stations and on buses are also reproduced. An account of the plan and methods employed in the stock-selling campaign was published in the ELECTRIC RAILWAY JOURNAL, issue of March 13, page 437.

Under Georgia Jurisdiction — The transfer of the Augusta-Aiken Railway & Electric Corporation from a South Carolina to a Georgia organization has been approved by the Secretary of State. The company operating a railway system between Augusta, Ga., and Aiken, S. C., has been functioning under a South Carolina charter since 1906. It is capitalized at $4,500,000.

Parley on Wage Agreement.—Negotiations are under way between the Memphis Street Railway, Memphis, Tenn., and the trainmen's union. The men are seeking an increase of 12 cents an hour over the present scale, which would fix the new scale at 57 cents for the first-year men, 62 cents for the second-year men and 67 cents for the men who have been in service for more than two years.

New Fare Hearing Allowed. — The Wheeling Traction Company, Wheeling, W. Va., has been granted a rehearing on its petition for a change in rates, according to A. C. Spurr, general manager of the company. The company seeks to sell nine tickets for 50 cents instead of ten tickets as at present. Mr. Spurr further stated that the petition had once been denied by the commission following a hearing. The change sought by the company for its lines on the West Virginia side of the river is now in effect in Ohio as the Public Utilities Commission of that state granted a similar petition some time ago.

Improvement in Worcester Service Planned.—The Worcester Consolidated Street Railway has announced a radical change in the operation of one-man cars in Worcester, Mass. Beginning April 20 it is planned to use one-man cars on all lines from 4:39 a.m. to 11 a.m. and after 8 p.m. The company anticipates an improved service under this plan. As an illustration of this the proposed new schedule provides for a 3½-minute headway between the City Hall and Webster Square.

Power Situation in Holyoke Adjusted.—The Massachusetts Department of Public Utilities has dismissed without prejudice the petition of the Turners Falls Power & Electric Company for permission to establish connections with the Berkshire Street station of the Holyoke Street Railway, in Holyoke, as a result of a settlement of the controversy between the Turners Falls company and the Holyoke Water Power Company. The petition asked for the right to take by eminent domain land necessary for a transmission line between Chicopee and the street railway power house. Contracts have since been executed providing that the railway shall receive energy from the Turners Falls company through sale to the Holyoke Water Power Company and resale by it. It was more than a year since the original hearing was given by the commission in Holyoke on the petition. At that time, the Turners Falls company's purpose was firmly opposed by the Holyoke Water Power Company on the ground that entrance to the city by the competing company would threaten the Holyoke company's status with manufacturing concerns that are large purchasers of energy. Hitherto efforts to bring the three companies to an agreement had failed.

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Recent Bus Developments

De Luxe Service by Public Service in New Jersey

Forest Hill, originally selected by the Public Service Transportation Company, Newark, N. J., to be among the first sections favored with de luxe buses, will have a line of this kind soon. At the same time a similar line will be started between Newark and Plainfield, if the plans of the company are successful.

Applications for municipal permits for the Plainfield line have been made to the municipalities through which the line will operate, with the exception of Newark. The Newark application will be made within a few days.

Eleven buses of the gasoline-electric drive type have been ordered for use on the two lines. Of these, six will be placed in the Newark-Plainfield service and five on the Forest Hill line. The bodies of the Newark-Plainfield buses will be of the de luxe type used on interstate lines and will have 27 seats upholstered in leather. No more than a seated load will be carried. The bodies of the Forest Hill line will be similar to the type ordered for general service but with leather upholstered seats.

The Newark-Plainfield route will be through Irvington, Union Township, Roselle, Cranford, Garwood, Westfield, Fanwood to Plainfield, a distance of 20 miles, with a scheduled running time of about one hour. The buses will give express service between the Newark terminus at the tube station to Union Township, no Irvington passengers being carried, running on a half-hourly schedule from 7:30 a.m. until after the close of the evening performances of Newark theaters. The through one-way fare has been fixed at 75 cents; intermediate fares will be in proportion, with a 10-cent minimum.

The Forest Hill line will serve local needs only. The one-way distance will be about 4 miles at a 10-cent fare.

The equipment and service are designed for shoppers, theatergoers and others who desire special comforts and conveniences. The Newark-Plainfield and Forest Hill lines will be followed by others if the approval of the public authorities is obtained.

Non-Stop Service Between Detroit and Toledo

Non-stop bus service between Detroit and Toledo was started on April 3 by the Detroit-Toledo Transportation Company, a subsidiary of the Detroit United Railway, operated under A. L. Drum, executive manager for the receivers of the railway. The buses start from the Detroit Bus Terminal at 158 Bagley Avenue. They make the non-stop run of more than 60 miles to Toledo in two hours and fifteen minutes. The buses carry only through passengers between Detroit and Toledo.

Except on Saturdays, the buses leave at 9:10 a.m. and 1:10 and 5:10 p.m., making three trips a day. On Saturdays and Sundays two additional buses are operated, starting from the terminals at 8:10 and 10:10 a.m.

The buses are named the Royal Blue Goose Fliers. They are Yellow Coach equipment, painted a royal blue with vermillion roof and hood and ivory colored window frames. The interiors are finished in white enamel, with staggered individual seats.

Sightseeing Services to New York Restrained

Supreme Court Justice George H. Taylor, Jr., of Mount Vernon, N. Y., has issued a temporary injunction against the New Rochelle Sightseeing Company restraining it from operating bus service from New Rochelle to Times Square, New York City. The injunction was obtained by the Westchester Electric Railroad. Two other companies are operating bus lines from New Rochelle to Times Square, but they were not specifically named in the injunction. The railway contended that it had franchises to operate over the routes on which the bus companies were operating. Justice Taylor has not given a decision on the application of the Third Avenue Railway for a permanent injunction against the Mount Vernon Sightseeing Company, which operates a bus line from that city to Times Square. Arguments on this application were heard on April 7 after a temporary injunction had been granted. The railroad said it was not legal for the buses to operate because necessity for a franchise had not been recognized by the commission.

New Bus Regulations in British Columbia

Speed, weight of cars, schedules and other details connected with the operation of buses will be the subject of regulations announced by the government of the province of British Columbia, Canada, as going into effect during the next few weeks. The proposed regulations set out in minute detail the gross weight, including weight of vehicle and its load, which may be hauled on any class of load on either of the two road seasons, winter or summer. All bus lines will have to file schedules of their operations with the Minister of Public Works, and if these schedules are approved must operate buses strictly in accordance with them. The speed of buses will be restricted to the average speed provided in the schedules. In addition, operators will have to furnish security in the form of a bond or policy of guarantee from an approved insurance company, covering possible accidents. The operator's liability is limited to $1,000 in respect of a single person and $5,000 in respect of all persons injured in a single accident. Buses must stop not more than 20 ft. away from any level railway crossing before traversing it.

Paving Question Raised in Kansas City

Advent of the bus system of the Kansas City Railways, Kansas City, Mo., has brought up the question among property owners as to who shall pay the expense incurred in repaving and repairing the streets over which the railway's buses are operated.

In the case of Warwick Boulevard, the City Council had arranged to have the street repaved at the expense of the property owners, but the plan has been meeting with not a little opposition.

In a recent "Speaking the Public Mind" column of the Kansas City *Star* one of the property owners contended that the brunt of the expense of repaving should not, in any event, fall upon the property owners. He did not demand that the Kansas City Railways be made to pay the amount expended, but he contended that some one other than the property owners should pay it. Since he credited the bus service with being responsible for much of the need of repaving and repairing the city streets, it was asked that the railway be assessed at least a portion of the expenses, or that the gasoline tax paid by that company be set aside as a sinking fund to care for future unavoidable expense.

Buses Win Temporarily in Beech Grove

After an absence of several weeks buses again are operating through the main thoroughfare of Beech Grove, Ind. The seesaw fight in which the town board of Beech Grove, the Beech Grove Traction Company and the South Side Motor Coach Company were involved finally resulted in a victory for the buses on March 17 when the Superior Court granted a temporary injunction preventing the board from enforcing the town's bus ordinances. One ordinance keeps the buses from the principal street or any street within one square of this street. The other prescribes a route for buses. A motion for a new trial, presented by attorneys for the town board, was overruled by the court. Attorneys then said an appeal would be taken.

The skirmish started last fall when the town board enacted its first regulatory ordinance. Officials of the bus company attacked the ordinance and carried their fight into the Marion County courts. Restraining orders were obtained against enforcement of the ordinance. On final hearing the restraining order was dissolved.

The buses then were operated over a new route. The board several weeks ago enacted a new ordinance, permitting the buses to use only certain streets. This route prohibited the buses from running to their station. A restraining order prohibiting enforcement of the ordinance was obtained by the operators. Judge Miller's recent action had the effect of dissolving the orders.

Citizens of Beech Grove were said to have assured Frederick Schmidt, who purchased the Beech Grove Traction Company at receiver's sale in Circuit Court, that he would have no competition from buses. The bus line was proposed after the sale was made.

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Franchise Awards in New York Expected by May 1

Joseph V. McKee, acting Mayor of New York City and chairman of the sub-committee appointed by Mayor Walker to arrange the terms for the bus franchises for which applications have been made by several companies, reports the work of that committee practically completed. The fundamental terms of the franchises have been gone over and the committee will make its report to the Board of Estimate and Apportionment within a few days. The Board of Estimate will then grant franchises to those companies or company which in its opinion appear to offer the best terms and give evidence of ability to carry the franchises. The franchises will probably be granted by May 1. In the event that this is so, the first of the buses to be run under the new arrangement will probably be in operation by July 1.

More Buses for Worcester.—The license board at Worcester, Mass., has granted the Worcester Consolidated Street Railway permits for two additional buses to Marlboro and one to Southbridge.

Bus Line to Replace Rail Line.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will replace railway service with bus service on its Wanderer's Rest Cemetery branch of the Walnut Street line. This is to provide more frequent service during rush-hour periods. The bus line will be included in the single city fare zone with full transfer privileges.

Route Book Ready.—A new bus route book has been issued by the Los Angeles Railway, Los Angeles, Cal., for the convenience of patrons. Copies may be obtained by writing or calling at the office of the traffic department, 1050 South Broadway, Los Angeles, Cal.

More Buses for Use in San Francisco.—The Market Street Railway, San Francisco, Cal., has started its first bus line. The new line is located in the Mission district. Three buses are being operated on a ten-minute schedule. The buses are of the latest safety coach type, and each accommodates 30 passengers. The Municipal Railway has several bus lines in San Francisco, but this is the first venture of the Market Street line into that field.

A Slogan Sought for Bus Riding.—A contest has been started by the Wisconsin Power & Light Company among its 150 Fond du Lac employees to secure a new name or slogan for use on its city and interurban buses. The slogan to be selected must not be longer than four words, which will be painted on all cars and buses operating in this territory.

Buses to Replace Remaining Lines in Salem.—T. E. Billingsley, superintendent of the street railway lines in Salem, Ore., has applied to the City Council for authority to replace the cars with buses on the South Salem-Fair Grounds route. Buses have already been substituted on the Seventeenth Street and Yew Park lines. The railway lines in Salem were included in the Southern Pacific system.

Financial and Corporate

$65,000,000 Associated Electric Financing

Offering was made on April 6 of $65,000,000 Associated Electric Company 5½ per cent convertible debentures, due 1946. The bonds were priced at 95¼, to yield over 5.90 per cent to maturity. The new issue is convertible into the $6 dividend series preferred stock of the Associated Gas & Electric Company at the rate of eleven shares for each $1,000 bond.

Thirty different issues of securities carrying interest or dividends at rates varying from 6 per cent to 8 per cent are to be retired through this financing. Security holders in all parts of the country will be affected, not only by the call of high interest bearing obligations but by reason of the fact that the new financing will furnish Associated Gas & Electric system with what is termed a sound and conservative vehicle for financing its future requirements. The position of stockholders and other junior security holders of Associated Gas & Electric Company, of which the Associated Electric Company is now the largest and most important subsidiary, is being materially improved through this financing, according to the bankers.

Practically the entire proceeds of the $65,000,000 of bonds to be sold tomorrow will go toward paying off underlying bond issues, preferred stocks, notes and bank loans, so that the interest charges of the Associated Gas & Electric Company will be somewhat less after the transaction than before, owing to the fact that many of the underlying bonds, preferred stocks and notes to be retired bear higher interest rates than the new bonds to be issued.

The offering syndicate was headed by Harris, Forbes & Company. It was announced that C. W. Beall and F. S. Burroughs of Harris, Forbes & Company will become directors of the Associated Gas & Electric Company.

Improvement in Earnings and Traffic in Springfield

Business of the transportation department of the Illinois Power Company, Springfield, Ill., both in earnings and in the number of revenue passengers carried, increased in 1925. This statement was contained in the report to the stockholders. Railway earnings totaled $708,984, against $691,386 for the year previous. The number of revenue passengers carried was 11,286,894, a total that exceeded either of the preceding two years and is an increase of 625,443 over 1924. This recovery is worthy of note, says the report, "especially in view of the fact that the management accomplished this result, provided an enlarged service, continued the development of a unified street railway and bus system and carried forward its program of track and paving improvements in the face of rising costs of operation and maintenance and a need for an increased fare."

The company expended $141,183 for additions and improvements to the transportation department. Two new bus routes were established and three new 29-passenger buses were purchased and placed in service.

$1,700,000 Equipment Trust Issue

Application has been made to the California Railroad Commission by the Key System Transit Company, Oakland, for permission to market $1,700,000, par value, of equipment trust certificates to supply funds to purchase two new turbo-electric ferryboats and 40 steel cars.

The boats are at present under construction in the Moore shipyards; eight of the cars have been delivered, three are en route from St. Louis and 29 others are being built.

According to C. C. Vargas, comptroller of the Key System, the certificates will bear interest at the rate of 5½ per cent and will be retired serially, the first $175,000 being redeemable three years after issuance. The remainder will be redeemed at the rate of $112,000 annually.

The new equipment to be secured by the certificates is valued at $2,153,561. A favorable decision by the Railroad Commission is regarded as likely in a few days.

Baltimore Valuation Confirmed

Acting on a protest filed recently by the United Railways & Electric Company, Baltimore, the Maryland Public Service Commission has handed down an order in which its valuation of $77,000,000 on the company's property is ratified, confirmed and made final. The commission recently fixed this valuation after a long series of hearings. In the total amount an item of $7,000,000 was allowed on the value of easements. This was protested by Clarence W. Miles, people's counsel, who has taken the question into the courts. Following Mr. Miles' action, the United filed a protest with the commission, charging the valuation on its property as fixed by the commission was too low. It was on this protest that the commission took its most recent action. Four items in the valuation were disputed.

Further Steps in Reorganization of Dayton Property

The Ohio Public Utilities Commission, by order entered March 31, 1926, authorized the Cincinnati, Hamilton & Dayton Railway to acquire the railway property of the Cincinnati & Dayton Traction Company and to issue to Thomas Conway, Jr., Warren S. Hayden and Livingston E. Jones, reorganization managers, in exchange for said property, $200,000 bonds secured by a first mortgage on the local rail-

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way lines in the city of Hamilton, Ohio; $250,000 first and refunding mortgage bonds secured by a lien on the entire property, and 59,500 shares of common stock without par value. In addition thereto the commission authorized the issue and sale of 500.000 shares of common stock without par value for cash and the extension of an underlying mortgage aggregating $200,000 covering part of the interurban line.

The foregoing steps have been taken in furtherance of the plan of reorganization of said property summarized in the ELECTRIC RAILWAY JOURNAL, issue of March 13, 1926, page 464.

Phoenix to Do Some Financing Soon

Following the submission of the report of the investigating committee, consisting of J. M. Richardson and A. B. Clements, recently appointed by Mayor Jefferson of Phoenix, Ariz., to make a survey of the local transit situation, it is now planned to hold a bond election to provide funds necessary for rehabilitation of the Municipal Railway property. City Manager Henry Rieger explained to the City Commission on March 31 that the plans for a special election to consider the voting of bonds would be completed within a week from that date and that the election itself would probably be set for some time in May. The amount of bonds to be issued will probably be $500,000.

Hull Electric Company Under New Control

The International Pulp & Paper Company, New York, has purchased the Hull Electric Railway and the Hull Electric Company, Hull, Que. The purchase includes the water power development at Deschenes Rapids on the Ottawa River above Hull, as well as a power development of the Hull Electric Company at Paugan Falls on the Gatineau River.

Bus Company Meets New Jersey Board's Stock Idea

The Delaware & New Jersey Transportation Company, which is to operate five bus lines in southern New Jersey and Delaware, was authorized on April 13 by the Board of Public Utility Commissioners to issue 5,000 shares of common stock and 2,400 shares of preferred stock at $100 a share.

The application of the concern was contained in an amended petition filed after the board refused to approve a prior request on the ground that the sanction sought would create a voting trust with control in a few stockholders' hands. At that time the company asked permission to issue $200,000 of non-voting preferred stock, 2,000 shares of non-voting common stock and 2,500 shares of voting common stock.

In granting approval of the amended application the board assigned a value of $50,000 to the common stock.

The decision is of interest because of the attitude taken by the commission on the matter of non-voting stock when the question first came before it. The ruling was made the subject of an editorial in the ELECTRIC RAILWAY JOURNAL for April 10.

Balance in Pittsburgh $52,131

Many Improvements Effected in 1925 on Lines Carrying 320,968,755 Passengers—Pittsburgh Motor Coach Company Reports Surplus

Final results of operations of the Pittsburgh Railways, Pittsburgh, Pa., for the year ended Dec. 31, 1925, leave a balance of $52,131 after provision for the agreed return on investment, cost of new money, liquidation of one-tenth of certain obligations assumed upon termination of receivership and payments to municipalities according to the terms of the respective agreements. This statement was made in the annual report of the Philadelphia Company, the parent company, to the stockholders. The gross revenues decreased $250,000 compared with the preceding year. After providing $2,075,000 for depreciation reserve, operating expenses and taxes were reduced $567,742, resulting in a gain of $282,942 in net earnings.

The effect of the weekly pass and other methods of stimulating the use of the street cars is reflected in the estimated number of car rides of more than 370,000,000 against the revenue passengers carried of 269,000,000, which includes transfers and the equivalent revenue rides per pass. The weekly pass and other special inducements to attract patronage have increased the volume of business and have made available to the regular car rider a lower fare. The result should be that without any noticeable increase in the expenses the additional rides which justify the purchase of the weekly pass can be taken care of. Furthermore, there is an incentive for many car riders to use the street cars during the day or in the evening, when otherwise they might not do so.

During the year 5.86 miles of track was added to the system and 2.06 miles abandoned, giving a net increase of 3.8 miles of single track. In addition, 26.06 miles of track was reconstructed, a program which is being closely followed in the work of rehabilitation planned well in advance.

The company has effected a number

SUMMARY OF INCOME OF THE PITTSBURGH RAILWAYS FOR THE YEAR ENDED DEC. 31, 1925

(Prepared in accordance with the terms of the agreement between city of Pittsburgh, sundry other municipalities, Philadelphia Company and Pittsburgh Railways.)

Gross revenue from street railway operations		$21,813,696
Operating expenses:		
Maintenance of way and structures	$2,492,696	
Maintenance of equipment	2,235,267	
Traffic	204,489	
Power	2,005,651	
Transportation	7,263,545	
General	913,405	
Miscellaneous	1,731,978	
Taxes	614,142	
Total		$17,461,176
Net revenue from street railway operations		$4,352,519
Auxiliary operations:		
Operating revenues	$176,007	
Operating expenses	153,977	
Net revenue from auxiliary operations		22,030
Total net revenue from operations		$4,374,550
Non-operating revenues:		
Rental of real estate and buildings	$24,927	
Interest and discount	247,402	
Miscellaneous	1,731	
Total	$274,061	
Non-operating expenses	12,420	
Net revenue from other operations		261,640
Gross income		$4,636,191
Income charges:		
Items under agreement:		
Return of 6% on property valuation of $62,500,000	$3,750,000	
Return of 6% on additional capital for new property: $5,000,000 for 12 months	300,000	
1,200,000 for 8½ months	51,000	
Payments of city of Pittsburgh and other municipalities in lieu of licenses and paving assessments	352,969	
Amortization of debt discount and expense on additional capital	122,817	
Items not under agreement:		
Interest on judgments and settlements	116	
Rental of Seventeenth St. incline plane	7,155	
Total		$4,584,059
Net income for the year		$52,131

STATISTICS OF PITTSBURGH RAILWAYS

Miles of road		335.69
Miles of track		595.86
Carhouses		19
Car shops		2
Passenger cars—motor	1,339	
Passenger cars—trail	188	
Miscellaneous cars	276	
Total cars		1,803
Passengers carried—revenue		269,345,924
Passengers carried — revenue, transfer and pass rides based on the equivalent in regular fares		320,968,755
Estimated number of car rides, including revenue, transfer and pass passengers		370,412,204
Car-miles operated		39,688,609
Car-hours operated		4,766,548
Earnings per passenger car-mile—cents		54.32
Average fare per revenue passenger—cents		7.94
Average revenue per car ride—cents		5.77

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE PITTSBURGH MOTOR COACH COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Operating revenues		$90,207
Operating expenses:		
Maintenance of equipment	$23,267	
Traffic	2,146	
Transportation	34,937	
General and miscellaneous	11,863	
Depreciation	10,482	
Taxes	2,588	
Total		85,284
Net revenue from operations		$4,922
Non-operating revenue—interest and discount		38
Gross income		$4,960
Income charge—interest on unfunded debt		1,916
Net income for the year		$3,043
Deductions from surplus—miscellaneous		15
Surplus, Dec. 31, 1925—per balance sheet		$3,028

STATISTICS OF PITTSBURGH MOTOR COACH COMPANY

Routes operated	3
Coaches owned	22
Coach-miles operated	193,867
Coach-hours operated	18,929
Passengers carried	338,387
Earnings per coach-mile, cents	41.67

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of improvements during the year both in operations and in additions to facilities. An outstanding improvement was in the rerouting which was effected in the downtown district, reducing overlapping. In the safety work, too, there was an improvement, resulting in a decrease of 5.45 per cent in the total number of accidents.

In April the company sold on excellent terms $1,200,000 of 6 per cent car trust bonds, series B. These bonds were taken by the public at a premium. With the proceeds 103 street cars were purchased. These cars were delivered late in the year. While continued study is being made of the problem of refunding and readjusting the capitalization of the railway system no plan is yet ready to be offered security holders. The holders of 88.8 per cent of the $2,187,000 matured bonds of thirteen underlying railways are co-operating generously by accepting meantime a continuation of the respective mortgage rates of interest.

During the year, through purchases out of funds available with trustees, derived from sales of property, underlying bonds to the amount of $219,000 were retired. Continuing the plan of eliminating subsidiary corporations where practicable several companies were closed out or merged with others.

On the subject of public relations the report says that undoubtedly the courtesy of trainmen, continuous advertising and dissemination of facts about the Pittsburgh district in general and street railway problems in particular, as well as the many appearances of officers before civic and trade organizations, have tended to bring about a closer understanding not only between passengers and personnel, but have continued to strengthen friendly relations with the general public.

President Thompson refers to the fact that the company won for the fiscal year ended Aug. 1, 1925, the award presented by the Charles A. Coffin Foundation "for distinguished contribution to the development of electric transportation for the convenience of the public and the benefit of the industry." In awarding the medal, the committee made it known that briefs of accomplishments were submitted in the contest by thirteen companies.

The accompanying tables contain statistics as well as income accounts of the railways and its bus subsidiary.

The Pittsburgh Motor Coach Company was chartered for the purpose of meeting a demand for this type of transportation. It began operations on Aug. 14, 1925, by taking over several independent companies, and on Aug. 17, 1925, established a new route between the downtown and Squirrel Hill sections of Pittsburgh. It also received a certificate of public convenience from the Public Service Commission of Pennsylvania for a route from downtown to the Point Breeze section of Pittsburgh, which will serve a high class residential district.

Petition for Discontinuance Allowed.—The Northern States Power Company has been authorized by the City Council of Eau Claire, Wis., to discontinue its interurban line between that city and Chippewa Falls and to tear up its tracks. Having secured the permission of the City Council of Chippewa Falls the company will now go before the commission for final permission.

Deficit of $210,355 in Buffalo

For the year ended Dec. 31, 1925, the International Railway, Buffalo, N. Y., reports a deficit of $210,355, against a deficit of $666,513 in 1924. The accompanying table shows the income account for 1925 compared with 1924.

INCOME ACCOUNT OF THE INTERNATIONAL RAILWAY FOR THE YEARS ENDED DEC. 31, 1925 AND 1924

	1925	1924
Passenger revenue	$10,357,800	$9,933,923
Other revenue	337,895	342,406
Operating revenue	$10,695,695	$10,276,330
Way and structures, equipment and power:		
Maintenance	1,505,072	1,647,992
Depreciation and renewals	1,016,000	1,016,000
	$2,521,072	$2,663,992
Power operation	634,890	646,057
Conducting transportation	3,235,793	3,421,455
General and miscellaneous	2,303,641	2,079,197
Taxes	712,704	698,642
Operation and taxes	$9,408,102	$9,509,345
Operating income	$1,287,592	$766,984
Non-operating income	48,094	46,225
Gross income	$1,335,686	$813,210
Interest	$1,434,943	*$1,362,781
Rentals	61,962	52,465
Amortization and discount	49,136	64,476
Income deductions or fixed charges	$1,546,041	$1,479,723
Deficit	$210,354	$666,513

* $87,106 credited to fixed charges, being the amount contributed by I. R. C. stockholders.

Earnings at San Diego for 1925 Decline

The San Diego Electric Railway, San Diego, Cal., reports to the Railroad Commission its 1925 operating revenue at $1,608,501, compared with $1,482,831 for 1924. The operating expenses, excluding taxes, for 1925 were $1,405,130 and for 1924 $1,220,041, leaving net operating revenue of $203,371 for 1925 and $262,790 for 1924. During 1925 taxes were $106,583 and for 1924 they were $100,492. Deducting the taxes leaves operating income of $96,788 for 1925 and $162,297 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income of $175,822 for 1925 available for interest, amortization of debt, discount, other fixed charges, non-operating expenses, dividends and surplus. This compares with $220,355 for 1924 for similar purposes.

Seeks to Abandon Unprofitable Trackage.—The Alabama Power Company proposes to abandon that portion of its Pickett Springs car line in Montgomery, Ala., which extends beyond the Montgomery state fair grounds. The distance which the company plans to dismantle and remove will be approximately 3,200 ft. It is the contention of the company that the portion of trackage sought to be abandoned is not profitable.

Small Abandonments in Mount Vernon.—The Westchester Electric Railroad, New York, on April 9 applied to the Public Service Commission for permission to abandon two small sections of its route in the city of Mount Vernon. In one of these cases the city contemplates widening the street and is willing to have the tracks removed. There is no demand for railway service there, it is said.

May Abandon Two-Mile Line.—It is understood that the stockholders of the Batavia Traction Company, Batavia, N. Y., are considering the abandonment of the trolley system and putting in a bus line. The Batavia Traction Company operates 2 miles of line.

Revenue Lower in Santa Rosa.—The Petaluma & Santa Rosa Railroad, operating in Santa Rosa, Cal., and vicinity, reports to the Railroad Commission its 1925 operating revenue at $567,695, compared with $605,332 for 1924. The operating expenses, excluding taxes, for 1925 are reported at $431,764 and at $450,797 for 1924, leaving net operating revenue of $135,930 for 1925 and $154,534 for 1924. During 1925 taxes amounted to $26,799 and for 1924 to $28,581. Deducting the taxes leaves operating income of $109,131 for 1925 and $125,953 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income available for interest and surplus of $116,024 for 1925 and $129,810 for 1924.

Income Higher in 1925.—Nearly $50,000 increase in net operating income of the Bamberger Electric Railroad, Salt Lake City, Utah, for 1925 over 1924 is reported by the company in its annual report filed with the Public Utilities Commission of Utah. Its profit and loss schedule is fixed at $548,621, or a decrease of $72,157 over the preceding year. The net operating income was $135,545. This was an increase of $47,865 over 1924. Transportation operation brought in a revenue of $577,411, to which should be added $6,163 revenues from other sources, giving a total of $583,574, with operating expenses of $444,030, a decrease of $23,345 over 1924. The investment in roadbed and equipment is $3,629,182. The company operates 73.21 miles of road.

Abandonment Petition Withdrawn.—The long-heralded plan of the Wisconsin Traction, Light, Heat & Power Company to abandon its interurban line connecting Neenah, Menasha and Appleton, Wis., was dropped suddenly when the Railroad Commission approved the company's request for the withdrawal of its abandonment petition made in October, 1925. Agreement with the commission, company and city representatives over the question of new bridges which were to be built by Neenah and Menasha over the Fox River, a substantial part of their cost to be borne by the railway, was responsible for the willingness of the company to continue this line. In its abandonment petition the railway contended that its fast-declining revenues, due to the private automobile and bus competition, would not allow it to share in the cost of any new bridges and recommended that no provision whatever should be made for the accommodation of its tracks in the design of the new bridges.

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Personal Items

M. B. Rosevear Leaves Public Service

M. B. Rosevear has resigned as superintendent of distribution of the Public Service Railway, Newark, N. J. Mr. Rosevear's record with that company covers a period of eighteen years. He went with the company as a cadet engineer in 1908. He was the first young man hired for the railway under the cadet system.

At that time the cadet course was arranged to cover a period of two years of training in the various departments

M. B. Rosevear

of the company, but Mr. Rosevear extended his period of apprenticeship over 2½ years. He served in the transportation, the track, the line and in the electric generation and distribution departments.

On Jan. 1, 1911, he was made assistant to E. J. Dunne, the superintendent of distribution. Mr. Dunne died in 1914 and Mr. Rosevear succeeded to the duties which he had performed, a few months later Mr. Rosevear being made superintendent of distribution.

Ever since that time he has been in charge of the entire railway power distribution system. This work has covered not only maintenance and construction but financial responsibility and the handling of the personnel of this state-wide system. No sooner had Mr. Rosevear succeeded Mr. Dunne than the World War threw upon the whole Public Service organization many added responsibilities, among them the need for extensions to the system.

At Cornell he had constantly reiterated to him the need for the engineer who hoped to keep abreast of the times to participate in the proceedings and the work of the engineering societies. It was good advice, and Mr. Rosevear followed it. In 1919 he was a member of the power distribution committee of the American Electric Railway Engineering Association. Later he was made chairman of that committee and served in that capacity for two years. For the last three years he has served on the engineering executive committee. He has taken an active interest in the projects of the American Engineering Standards Committee and represented the American Electric Railway Association on certain technical committees dealing particularly with the subject of wire and cable standardization. He is also a member of the sectional committee dealing with the revision of the National Electrical Safety Code.

The whole course of Mr. Rosevear's experience has been so directed on the combined railway and the power and light system in New Jersey as to qualify him eminently not only in the line of work in which he has been engaged but in electric light and power distribution and as an executive. His plans for the future are not fully matured.

T. N. McCarter a United Gas Improvement Director

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, has been elected a director of the United Gas Improvement Company, Philadelphia, to succeed the late Randal Morgan. Mr. Morgan was president of the Philadelphia company at the time of his death, but no announcement has been made of a successor to him in that post.

Directors of the Public Service Electric & Gas Company, a Public Service Corporation subsidiary, announced the election of Richard R. Young as vice-president in charge of sales. F. Milton Ludlow, stock transfer clerk of the Public Service Production Company, has been elected assistant treasurer, and Ivan L. Gulick, auditor, has been made general auditor.

E. H. Sniffin and T. J. Pace Assume New Responsibilities

Culminating in a reorganization of the Westinghouse Electric & Manufacturing Company sales system, which has been in course of development for some time, E. H. Sniffin, formerly manager of the power department, was made assistant to the vice-president, and T. J. Pace, formerly manager of the supply department, became director of sales. The announcement of these appointments, as well as a number of others affecting departmental sales managers, was made in the issue of ELECTRIC RAILWAY JOURNAL for April 3.

E. H. Sniffin

Mr. Sniffin, newly appointed assistant to the vice-president, became prominent as commercial aide to George Westinghouse, founder of the Westinghouse Company. He is one of three men who are directly responsible for the introduction of the steam turbine to the United States. His whole career has been closely bound up with the Westinghouse destinies. In his sixteenth year he became a stenographer in the New York offices of Westinghouse, Church, Kerr & Company, who were, at that time, sole agents for the Westinghouse Machine Company. Not long content with a purely routine job,

T. J. Pace

he devoted spare moments to the study of mechanical engineering and at the age of 22 became a salesman of power plant equipment. He was not long in impressing the force of his personality upon his associates and in 1900 was made sales manager of the company he had joined as a stenagrapher.

Further advances were not slow in materializing. Three years later he was appointed sales manager of the Westinghouse Machine Company and in 1906 became vice-president in charge of sales for the company. When the electric company absorbed the machine company in 1915 Mr. Sniffin was made manager of the power sales department. He has held that position until his most recent promotion was announced.

The new director of sales, Mr. Pace, has held the position of manager of the supply department since 1922. He became associated with the Westinghouse interest in 1899, when he was engaged by the Manhattan General Construction Company, Newark, N. J., owned at that time by George Westinghouse. During the latter part of the three years Mr. Pace was with the Manhattan Company he held the position of assistant to the general manager. In 1902 the Manhattan Company was purchased by the Westinghouse Electric Company. At that time Mr. Pace forsook the purely constructive enterprises which had characterized his activities previously. He moved to East Pittsburgh and was placed in charge of illuminating apparatus in the detail

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and supply correspondence department. Three years later he was made manager of what was termed the illuminating and rectifier sections. From the former detail and supply department appeared an outgrowth known as the supply sales department, and in 1915 Mr. Pace was made assistant to the manager of this department. Only five years elapsed and Mr. Pace was assistant manager of his department, a position he held until 1922, when he was appointed manager.

F. D. Gordon Heads New England Street Railway Club

For the second time within a period of five years the railway men of the New England territory are congratulating Frederick D. Gordon. The occasion this time is his election as president of the New England Street Railway Club,

F. D. Gordon

which took place at the meeting in Boston on March 26. The other time they rejoiced with him was in January, 1921, when he assumed the general managership of the Cumberland County Power & Light Company, Portland, Me.

Mr. Gordon entered the public utility business in the power and light department in 1896, and has been associated with public utilities for 30 years. He was manager of the Androscoggin Electric Company, which operates an interurban railroad between Portland and Lewiston, Me., for fifteen years, and has been general manager for six years of the Cumberland County Power & Light Company, which operates the Portland Street Railway.

As general manager of the latter property he succeeded A. H. Ford. In this capacity he has had charge of a system capitalized at more than $2,000,000 and serving a population of 100,000 people. The railway department of the company operates 106 miles of track, including a number of interurban lines.

Mr. Gordon is regarded as one of the most efficient railway operators in New England. He was born in the town of Readfield, Me., in 1876.

Thomas E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has sailed for Europe. He intends to visit England, France, Germany and Austria, studying taxicab operation in London, Paris and Berlin. Other than this the trip is purely for pleasure. He is accompanied by A. G. Mitten.

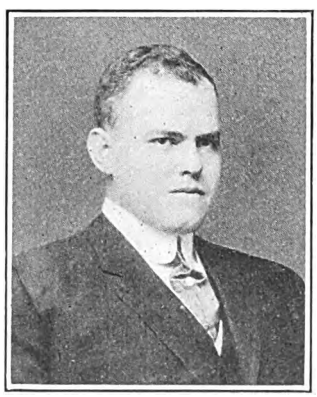
H. A. Hegeman and W. C. Peters Are Advanced

Harold A. Hegeman accedes to the position of first vice-president and treasurer of the National Railway Appliance Company, New York, N. Y., while W. C. Peters assumes the duties of vice-president in charge of sales and engineering, following the resignation from the former office of Charles C. Castle.

Mr. Hegeman is well qualified by a long and varied experience in the railway field to undertake the responsibilities of his new office. His is no mere smattering of knowledge regarding the complexities of electric railway practice. He served an arduous apprenticeship in the shops of the New York & Queens County Railway, passing through the mechanical and maintenance of way departments, before taking a position with the United States Metal & Manufacturing Company as salesman. Later that company was liquidated and the railway end was succeeded by the National Railway Appliance Company. Mr. Hegeman became vice-president and treasurer of that concern in 1917. That office has been his until his recent election to be first vice-president.

Prior to his service with the New York & Queens County Railway Mr. Hegeman was affiliated with the Ingersoll-Rand Company in its pneumatic hammer department. In fact it was with this firm that his business career started. He entered the shops, but later served in the sales end of the company. Mr. Hegeman is a member of many transportation clubs and similar organizations, among them the New England Street Railway Club, the New England Railroad Club, the New York Railroad Club, the Central Railway Club, the American Electric Railway Asociation and the Metropolitan Section, A.E.R.A. He is also a member of the Engineers Club of Boston, Mass.

Mr. Peters became affiliated with the National Railway Appliance Company in April, 1920, as manager of the New England department. His not-to-be-gainsaid abilities in sales and engineering work soon led to his appointment as manager of all sales and engineering activities of the company. His recent elevation to the vice-presidency is but fitting tribute to the qualities of executive leadership which the passing years have discovered.



H. A. Hegeman

Born on Sept. 29, 1891, at St. John, New Brunswick, Mr. Peters was educated at the English high school in Worcester, Mass., later taking the mechanical engineering course at Worcester Polytechnic Institute. He entered the employ of the Boston & Albany Railroad in June, 1911, as a special apprentice in the locomotive shops at West Springfield. He successively held positions as shop draftsman, foreman, safety appliance inspector, and then located in the office of

W. C. Peters

the superintendent of motive power and rolling stock at Boston as draftsman and assistant mechanical engineer.

Mr. Peters enlisted with the Fourteenth Engineers (light railway) in June, 1917, going overseas in July, 1917. He successively saw service on the Somme front, in the Château-Thierry sector and in all of the later major engagements of the United States forces. He returned to this country as a first lieutenant and was discharged in July, 1919. He is also a member of the railway and steam railroad clubs with which Mr. Hegeman is affiliated, is a member of the Society of Automotive Engineers and of the Engineers Club of Boston.

W. A. Bertke, assistant division manager of the Illinois Power & Light Corporation, Chicago, Ill., has been elected president of the Illinois State Gas Association.

Harold E. Bachman has been appointed acting superintendent of distribution of the Public Service Railway, Newark, N. J., to succeed M. B. Rosevear, resigned. Mr. Bachman has been with the company about six years. More recently he has been distribution engineer. Before that he was connected with the Interborough Rapid Transit Company, New York. Not all his experience has been in railway work,

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for Mr. Bachman engaged in industrial work upon his graduation from Penn State College.

Obituary

John W. Shartel

A gray dawn broke for the residents of Oklahoma City, Okla., on April 14, occasioned by the death the day before of John W. Shartel, president and general manager of the Oklahoma Railway and co-receiver of that company. With his death there passed also a spirit of adventure, evidenced by his work in organizing this railway with 138 miles of city and interurban tracks. He shared with Anton H. Classen the honor for the excellent system of transportation which the people of Oklahoma City now enjoy. Each of these men in his respective field made the success of the enterprise possible. In the brief period of twenty years the city grew from a town of 15,000 to a city of 100,000 population. The local company was liberal in the building of new lines through unsettled territory and in securing much private right-of-way for terminals. In addition the company has been almost uniformly successful, which is mighty significant in view of the adverse conditions affecting electric railways everywhere during and since the war-time period.

Mr. Shartel was graduated from the Kansas Agricultural College, Manhattan, Kan. Following graduation he went to Topeka to study law and was admitted to the bar in 1885. He then practiced law in Topeka for a year and later went to Sedan, Kan. After serving three years there as county attorney he formed a partnership in 1890 with W. C. Hackney and practiced at Winfield, Kan., until Jan. 1, 1893, when he moved to Guthrie, Okla., where the firm of Asp, Shartel & Cottingham was formed. In 1898 Mr. Shartel went to Oklahoma City and became general attorney for the Choctaw, Oklahoma & Gulf Railroad, which position he held until 1901. Several years later he formed a law partnership with J. R. Keaton and Frank Wells. This connection continued until 1912, when he retired in order to devote his time to the Oklahoma Railway, which he had helped to organize in 1902 and which had grown meanwhile to such proportions that the conduct of the company's affairs required the greater part of his time. He was vice-president and general manager of the property for many years before assuming the presidency upon the death of Mr. Classen in 1923.

In 1920 he was elected president of the Oklahoma Utilities Association and the following year was re-elected to that office. Mr. Shartel was also a director of the Chamber of Commerce of the United States, representing the Fifth District. He was elected to this office at the last annual meeting of the chamber held in Washington in May, 1922.

Mr. Shartel was born in Harmonsburg, Pa., in 1862. When he was very young his parents moved to Missouri. There the man who later was to be a railroad pioneer in Oklahoma received his early education.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Gerard Swope Analyzes Labor Problem of General Electric

How the introduction of more automatic machinery and improved methods of manufacture have resulted in a reduction of prices of products of the General Electric Company, as well as higher wages for employees, is pointed out in a statement made public recently by Gerard Swope, president, in announcing figures of the company's business for the first three months of the present year. Mr. Swope said in part:

A study of our largest factory, at Schenectady, where today 21,000 men and women are employed, indicates that supplementing the worker's skill by electrical power has enabled him to increase his earnings. This is along the lines that civilization has moved in the past. It has been the constant effort of man to produce the necessities of life in the least time and with the least effort.

During the twelve-year period from 1914 to 1925 the cost of living increased about 68 per cent, while the average earnings of the workers (not the hourly rate, but the actual dollars they received each week) increased 107 per cent; in other words, more than doubled.

Let us assume that the average earnings in 1914 were $20 per week and the average cost of living was $18 per week, leaving a margin over and above the cost of living of $2 per week, or 11 per cent. In 1925 the average income would be increased 107 per cent to $41.40 per week, while the cost of living would have increased 68 per cent to $30.24, leaving a margin of $11.16 per week, or 37 per cent over and above the cost of living.

In this same period the electric power consumed in this plant, much of which is purchased from a public utility company operating hydro-electric plants, has also more than doubled—from 45,000,000 kw.-hr. in 1914 to 93,000,000 kw.-hr. in 1925, while the average number of workers increased 34 per cent. The product of this plant during the twelve years under review, measured in dollars, increased 179 per cent.

In concluding his statement, Mr. Swope declares that these figures show progress in the right direction. He believes that, with more power supplied to the worker, he produces more with less effort and is thereby enabled to earn more money and improve his standard of living.

Extensive Improvement Program for Tampa

The Tampa Electric Company, Tampa, Fla., plans an extension program of $2,000,000 and will not stop at that figure if conditions warrant further expenditures. Approximately $500,000 will be expended on the railway department. T. J. Hanlon, general manager, referring to the program, said that from 20 to 25 new street cars would be added this year on the Belmont Heights line. The order, which will be placed soon, will approximate an expenditure of $160,000. Eight new buses to be operated on East Broadway will be ordered soon at a cost of $64,000 and will be similar to those now in use throughout the city.

In addition the company is planning considerable trackwork. One project will be double tracking the Hyde Park line at an expenditure of $60,000. This work will be completed in about three weeks. Directors have approved a recommendation to double track Grand Central Avenue at a cost of $40,000. This project is awaiting the approval of the City Commission. Passing tracks to accommodate additional cars on Seventh Avenue, Nebraska Avenue and Belmont Heights lines will be installed at a cost of $25,000. The company's share toward the construction of the Fortune Street bridge is $75,000. This will include the laying of street car rails.

Under construction the company now has an automatic substation at Eighth Avenue and Tenth Street, costing $40,000. In addition to this work, a two-story addition is being constructed adjacent to the present building of the Tampa Electric Company and will be completed in July at a cost of $85,000.

Obstacles in the Path of Coal Legislation

Constitutionality is the big obstacle in the path of coal legislation. This was brought out clearly during the second week of the coal hearings before the committee on interstate and foreign commerce of the House of Representatives.

Chances of any legislation have been hurt by the differences of opinion among the members of the House as to what form the legislation should take. Each witness has a different plan and most of them are hostile to the other proposals. There is marked opposition to the creation of another "extravagant" government agency to deal with coal. There has been considerable crystallization of opinion against lodging the emergency powers with the President.

The point is made that under present conditions a strike among the soft coal workers would not interfere particularly with supply. Non-union operations have increased to the point where they can meet the country's requirements. All western Kentucky is now non-union. Only 5 per cent of West Virginia's production now comes from union mines. Indiana and the Pittsburgh district are developing production which is not under union control.

The position of the operators seems to be that the public is amply protected in the matter of bituminous coal supply, except possibly against strikes. The producing area is scattered widely. There is no semblance of monopoly or centralized control of production. As there now is no great probability that a coal strike could stop enough bituminous production to cause much trouble, the greater danger lies in the possibility of a railroad strike. Even that is be-

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coming more remote, but the hearings before this same committee developed the fact clearly that no absolute assurance against strikes can be established. The feeling is that that situation can be controlled alone by public opinion. The conduct of the public during the last strike, it will be pointed out to the committee, has done more to discourage another anthracite strike than any legislation that could have been enacted for this purpose.

Action Now Pending in Detroit on Bus and Car Bids

Funds Have Been Requested from the City Council to Purchase Needed Rolling Stock Equipment—Several Financing Plans Suggested by Manufacturers

Five manufacturers submitted bids on Peter Witt type cars as specified by the Department of Street Railways, Detroit, Mich., and six companies bid on the light-weight type cars, in answer to the department's request for bids on from 150 to 300 street cars for replacements and additions to the D.S.R. equipment.

Bids were asked on a cash basis and also based on time payments. Each company submitted a cash bid and a bid on the seven-year payment plan, but no bids were received on the ten-year payment basis suggested by the department.

The following bids were received for cash tenders on Peter Witt type cars f.o.b. Detroit in accord with the department's specifications:

	Cars	Each
Osgood-Bradley Car Co., Worcester, Mass.	50	$17,792
J. G. Brill Co., Philadelphia, Pa.	150	$17,500
	300	$17,500
Cummings Car & Coach Co., Chicago, Ill.	50	$17,425
St. Louis Car Co., St. Louis, Mo.	150	$17,500
	300	$17,500
Cincinnati Car Co., Winton Place, Ohio	50	$17,675

The bids submitted on the Peter Witt type cars on the seven-year payment plan were as follows:

	Cars	Per Car per Month
Osgood-Bradley	50	$263.27
J. G. Brill	150	$258.93
Cummings Car & Coach	50	$257.82
St. Louis Car	100	$258.93
Cincinnati Car	50	$261.52

Numerous alternate proposals were submitted based upon cars with fixtures and equipment not in accordance with the regular specifications, which affected the price bid on the complete car, both on the cash basis and on the seven-year payment plan.

On the light-weight cars six bids were received on from 50 to 300 cars for cash tenders and 50 to 150 cars on the seven-year payment plan. The cash tenders were as follows:

	Cars	Each
Osgood-Bradley	50	$16,350
J. G. Brill	125	$16,000
	300	$16,000
Cummings Car & Coach	50	$15,886
St. Louis Car	125	$15,978
Cincinnati Car	50	$16,266
Light-Weight Noiseless	125	$16,000

The proposals submitted for the light-weight cars on the seven-year payment plan of 84 equal monthly payments were:

	Cars	Per Car per Month
Osgood-Bradley	50	$241.91
J. G. Brill	150	$236.75
Cummings Car & Coach	50	$235.00
St. Louis Car	125	$236.42
Cincinnati Car	50	$240.68
Light-Weight Noiseless	125	$287.60

In a letter to the City Council, written April 6, H. U. Wallace, general manager of the D. S. R., cited that the department had received the bids on 125 motor coaches and 150 street cars and requested an allowance in this year's budget of $4,000,000 for the purchase of the equipment—$1,670,000 for buses and $2,330,000 for street cars. He further cited that the D. S. R. has received cash bids on buses, one company offering a monthly plan which would extend over seven years, but with a restriction in the bid which provides that this monthly payment plan will be an unconditional obligation of the city of Detroit. This restriction is not practical, as the obligation will only be an obligation of the Street Railways.

The cash cost of 150 cars is $2,400,000. This is $70,000 more than is being asked in the budget, but the department can provide the $70,000 out of present funds. If this money is provided through budget allowance so that budget bonds can be issued and cash paid for the equipment the total cost of the street cars, including interest paid on bond money at 4½ per cent, will be $2,782,507, the letter states. If purchased on the time-payment plan as offered by the bidders, on equal monthly payments over a period of seven years, the equipment will cost $2,983,050. The increased cost of purchasing the equipment on the seven-year plan over the cash payment plan will amount to $200,542.

The cash cost of 125 buses is $1,670,000. If this money is provided through budget allowance so that the department can issue budget bonds and pay cash for the equipment the total cost of the coaches, including interest on bond money at 4½ per cent, will be $2,047,800. If purchased on the time-payment plan as offered by the bidder, on equal monthly payments over a period of seven years, the equipment will cost $2,226,950. The increased cost of purchasing the equipment on the seven-year plan over the cash payment plan will amount to $179,150.

Mr. Wallace said:

> It will be noted from the above that the total saving to the Department of Street Railways resulting from an issue of budget bonds to cover the purchase of this equipment will amount to $379,692.

The general manager recommended to the Council that this saving be taken into consideration with a view to authorizing bonds in the amount of the total cost of this equipment with a ten-year maturity. Speaking of the need for the new equipment Mr. Wallace said:

> We do not believe that sufficient service can be given to the people without the purchase of 125 gas-electric coaches and 150 street cars.

The D. S. R. is now renting approximately 60 street cars per day from the Detroit United Railways and during the past winter was unable, despite this emergency measure, to give satisfactory service owing to the lack of equipment. The general manager estimates that the department should have at least 150 cars to replace the cars now rented to take care of the business of the coming winter. 157 street cars are in operation that vary in age from 21 to 26 years. These cars are running on an average of 100 miles per day and the expense of maintenance on this equipment is growing daily. These cars are so old that they cannot be kept in condition to give the people satisfactory service without a very large expenditure of money, the general manager stated. The letter continues:

> By the purchase of the new cars we can set the old cars aside, using them only for tripper service, two hours in the morning and two hours at night. By putting these cars to this use we can utilize them for another year.

It is pointed out that the department's present coach service is very inadequate on lines now in operation, owing to shortage of coaches. It is very difficult to give the equipment proper attention in order to keep it in working order and there are a number of new lines that should be put on during the coming year to serve outlying districts. In addition, the general manager cited, coaches should be substituted for the service now being given on the Woodmere line, which is unsatisfactory, owing to the fact that the old car line on Porter Street is worn out and was abandoned more than a year ago.

That there is also a large demand for a new coach line on Fourteenth Street from the end of the pavement near Boston Boulevard into the center of the city is stated, and the opinion is expressed that it is absolutely necessary for the department to provide the equipment requested at this time.

Increased Fares Permit Akron Company to Purchase New Buses

In line with its avowed policy of providing an adequate co-ordinated transportation service to the city of Akron, Ohio, the Northern Ohio Traction & Light Company has just purchased twenty Safeway bus chassis and two complete double-deck buses from the Six-Wheel Company, Philadelphia, Pa. Bus operation in Akron has been conducted at a loss since its inauguration by the company due to franchise restrictions which made it impossible to impose an adequate fare. It was

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finally suggested that the whole matter be laid before the people living in communities which would be served by the proposed new express bus line.

Neighborhood meetings were held in residential sections and petitions circulated in the factory districts. Practically no opposition was encountered, and in a short time a citizens' committee approached the City Council with petitions containing thousands of signatures asking that the railway company be compelled to institute an express bus service with a 10-cent fare. The net result of this agitation was the purchase of the equipment previously mentioned.

During the current year the Northern Ohio Traction & Light Company plans to spend approximately $500,000 on new buses, while $30,180 will be spent in rebuilding truck bus equipment. The Six-Wheel equipment just purchased will be used in express service to outlying sections of the city.

Specifications for Richmond Cars Were Misstated

A number of errors occurred in the list of specifications on fifteen cars now being built by the American Car Company for the Virginia Electric & Power Company, which was published in the issue of ELECTRIC RAILWAY JOURNAL for March 20. These items are herewith corrected:

Headlining ..... Haskelite
Curtain fixtures .... National Lock Washer Company
Registers ..... No registers were installed on these cars
Sash fixtures ..... Schecter post casings without sash locks
Ventilators ..... Utility
Trucks ..... Brill 177-E-1
Special devices, etc. .... Full safety devices

Southern Properties Order Light-Weight Cars

Orders for new rolling stock have just been placed with the Light-Weight Noiseless Electric Street Car Company, Chicago, Ill., by three Hodenpyl, Hardy properties. Ten double-end light-weight cars will be delivered to the Tennessee Electric Power Company, Chattanooga, Tenn.; ten cars of a similar type to the Nashville Railway & Light Company, and thirteen cars to the Southern Indiana Gas & Electric Company, Evansville, Ind. A portion of these latter cars will be double end, while the remainder will be of single-end construction. Delivery of all of the units is expected to be made in 120 days from the date of ordering.

Railway Motor Exports Decrease in February

While there was a slight decrease in the exports of railway motors during the month of February, this was more than balanced, from the standpoint of the electrical industry as a whole, by the increase in stationary motors of more than 200 hp. There was a considerable increase in the shipments of fractional horsepower motors and of stationary motors of from one to 200 hp. Shipments of accessories and parts for motors increased materially.

A marked increase was noted in the exports of electric locomotives, the total being $477,485 for February, 1926, as against $7,563 during February, 1925. Shipments of portable electric tools totaled $33,506 during February, as against $19,196 during January.

"900" Type Cars for Atlanta

Work has been started by the Cincinnati Car Company on an order for 60 new street cars received from the Georgia Railway & Power Company, Atlanta, Ga. As reported in ELECTRIC RAILWAY JOURNAL for March 27 the cars are similar in type to those already in operation on the Georgia company's lines and will seat 48 passengers. They are designed for double-end operation, the rear door being treadle operated. Provision will be made so that a street fare collector can open this door from the outside with a key. The clear height of the cars inside will be 7 ft. 11⅜ in. Specifications follow:

Weight ..... 37,300 lb.
Length over all ..... 45 ft. 4 in.
Post centers ..... 29½ in.
Truck wheelbase ..... 5 ft. 4 in.
Width over eaves ..... 8 ft. 3⅜ in.
Height, rail to trolley boards .. 11 ft. 2⅛ in.
Roof ..... Monitor
Air brakes ..... Westinghouse
Compressor ..... Westinghouse DH-16
Control ..... G. E. K-35-JJ
Curtain fixtures
Operator's vestibule curtains
Curtain material ..... Pantasote
Door-operating mechanism
National Pneumatic
Fenders ..... "Atlanta" type drop basket
Gears
G. E. A-1 long and short addendum tooth
Hand brakes ..... Peacock staffless
Heater equipment
Twelve Consolidated panel electric
Lightning arresters ..... Aluminum cell
Motors ..... Four G. E. 265-A, 35 hp.
Seats .... Hale & Kilburn No. 400 reversible
Seating material
Springless canvas lined rattan
Slack adjuster .... American Brake Co., E-1
Trucks
Brill No. 177-E-1 Stucki side bearings
Wheels ..... 26 in. diameter
Special devices, etc. ..... Safety
Car Devices double-end safety equipment

Haskelite Marketing Policy Cites Operating Facts

Selling operators of street cars and buses with cold facts has been the advertising policy of the Haskelite Manufacturing Corporation, Chicago, Ill., according to an article appearing in the March issue of *Class Industrial and Trade Advertising*. It was not sufficient, the Haskelite Corporation found, to make general statements as to the saving effected with Haskelite or Plymetl. To the companies in the electric railway field, therefore, it has stated definitely how Haskelite or Plymetl has been used, the exact number of pounds weight saved, and has ended by translating this into dollars. The article outlines the development of Haskelite products for use in transportation.

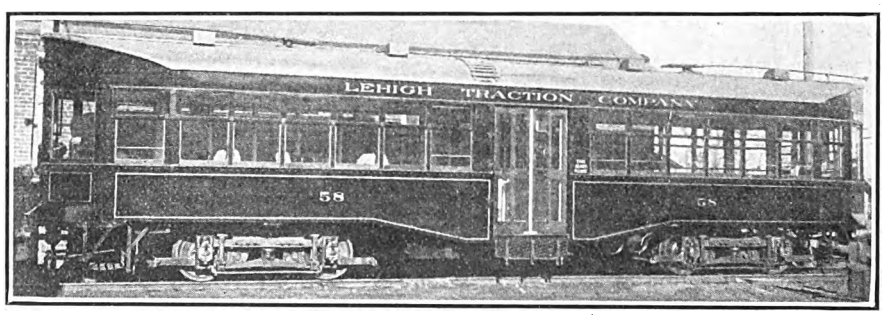
$196,268 Increase in Allis-Chalmers Net Earnings

A net profit of $3,417,368 after charges, depreciation and federal taxes is shown in the report for 1925 of the Allis-Chalmers Manufacturing Company. After preferred dividends this equals $8.78 a share earned on $25,770,750 of common stock. This compares with $3,221,100, or $8.01 a share, in 1924. The surplus, after dividends, for 1925 stood at $716,315, as against $1,035,461 in 1924.

The company had unfilled orders amounting to $10,147,073 on Dec. 31, as compared with $10,124,028 on Dec. 31, 1924.

Total sales for 1925 reached $28,921,357, as against $27,855,523 in 1924. Other income for the two years respectively was $689,666 and $632,504. Costs, depreciation, etc., reached $25,639,655 last year, while federal taxes were $554,000. In 1924 these figures were respectively $24,751,927 and $515,000.

Lehigh Cars on Modernized Trucks



In the early part of 1925 the Lehigh Traction Company, Hazleton, Pa., placed an order with the J. G. Brill Company, Philadelphia, for three complete cars mounted on Brill 27-MCB-1 trucks, duplicating trucks furnished the railway ten years ago. Ten all-steel bodies were also ordered to be mounted on modernized 27-E-1 trucks. A description of these trucks appeared in the issue of ELECTRIC RAILWAY JOURNAL for Jan. 16, 1926. General specifications on the cars follow:

Seating capacity. Smoker, 40; passengers, 30
Length over all ..... 48 ft. 8 in.
Truck wheelbase ..... 6 ft. 0 in.
Width over posts ..... 9 ft. 0 in.
Height, rail to trolley board ..... 11 ft. 8½ in.
Body ..... All steel
Interior trim ..... White enamel
Roof ..... Arched
Air brakes ..... Westinghouse
Bumpers ..... Hedley anti-climber
Car signal system ..... Buzzers
Compressor ..... G. E. CP-27-B
Control .... G.E. type M, automatic features
Couplers. Tomlinson form and radial drawbar
Curtain fixtures ..... Rexall metal rollers
Curtain material ..... Pantasote 86 Morocco
Destination signs ..... Hunter illuminated
Door operating mechanism
National Pneumatic
Fenders ..... HB lifeguards
Heater equipment
National Railway Appliance
Headlights ..... Golden Glow RR28
Paint ..... Black with gold lettering
Sanders ... Two Wyoming type, air operated
Seats ..... Longitudinal and transverse
Step treads ..... Irving
Trucks ... Three Brill 27-MCB-1; ten 27-E-1
Ventilators ... Railway Utility honeycombed

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$2,587,422 Increase in G. E. Orders for Quarter

Orders received by the General Electric Company for the first three months of the present year totaled $86,433,658, Gerard Swope, president, has announced. This compares with $83,846,236 for the first three months of 1925, or an increase of 3 per cent.

Rolling Stock

Asheville Power & Light Company, Asheville, N. C., has received seven 29-passenger gas-electric buses from the Fageol company, Kent, Ohio. Two new street cars were also delivered recently by the J. G. Brill Company, Philadelphia, Pa. The new cars will be placed in service on the Grace-Biltmore line, while the buses will supplant the old equipment which has been in service between the city and West Asheville. The new buses are equipped with Westinghouse air brakes.

Stark Electric Railroad, Alliance, Ohio, ordered eight passenger interurban cars from Cincinnati Car Company on March 13. Following delivery, which is expected about June 15, the cars will be placed in interurban service between Canton and Salem, with limited service on the hour and local service on the half hour. Principal specifications are given here:

Seating capacity	52
Weight	32,500
Length over all	47 ft. 3 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8⅝ in.
Height, rail to trolley base	10 ft. 10¼ in.
Body	All steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	General Electric
Bumpers	Cincinnati Car Co.
Conduits and junction boxes	General Electric
Control	K-35 KK
Curtain material	Pantasote
Destination signs	Perforated sheet metal
Door operating mechanism	Pneumatic
Fare boxes	Cleveland
Hand brakes	Cincinnati Car Co.—staff brake
Heater equipment	Electric
Journal boxes	Pedestal type
Lightning arresters	General Electric
Motors	Four G.E. No. 265A, 35 hp.
Finish	Duco
Sanders	Cincinnati Car Co.
Seats	Transverse, non-reversible
Seating material	Leather in smoker —washable linen in passenger compartment
Slack adjuster	Turnbuckle
Springs	Combination elliptic and coil
Trolley retrievers	Ohio Brass
Trucks	Cincinnati Car Co.
Wheels	28 in.

Key System Transit Company, Oakland, Cal., has received the first six of an order of 40 new cars from the American Car Company, St. Louis, Mo., which are now being made ready for service in the shops at Oakland. Specifications on these cars were published in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 22, 1925.

Chicago Surface Lines, Chicago, Ill., is at present negotiating for the purchase of a number of new street cars.

Track and Line

Dallas Railway, Dallas, Tex., has extended its Mount Auburn car line for a distance of a quarter of a mile. The construction of the extension through new residential sections in the White Rock Lake district was financed by real estate developers at a cost of $20,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will take up the tracks of the stub line between 47th Street and the cemetery to permit the city to proceed with paving improvements and the same district will also be tapped soon by another extension to the Center Street car line, taking in the now unserved territory between 51st Street and Lisbon Avenue. Construction on this extension will start just as soon as weather conditions permit. About 2,900 ft. of double track will be laid, at an estimated cost of $49,000.

Trade Notes

Robert W. Hunt Company, Ltd., has appointed its chemical engineer, F. O. Farey, manager of its Montreal office, but has made no change in the personnel of its offices at Toronto and Vancouver or in the conduct of its inspection and testing work.

R. M. Alvord has been appointed manager of the San Francisco office of the General Electric Company, according to an announcement by J. A. Cranston, Pacific Coast manager. Mr. Alvord succeeds E. O. Shreve, who recently was made manager of the industrial department of the company with headquarters in Schenectady.

Pierce-Arrow Motor Car Company, Buffalo, N. Y., announces that total shipment of all vehicles produced during March represents an increase of 33 per cent over the total shipment in March, 1925. Shipments for the first quarter of this year show an increase of 30 per cent over the same period of 1925. These figures cover passenger cars, heavy-duty trucks and Pierce-Arrow buses.

Electric Service Supplies Company, Philadelphia, Pa., has announced the removal of its Pittsburgh office from Room 829 Oliver Building to Room 1123 Bessemer Building. The move was made necessary by the demand for new and larger quarters.

New Advertising Literature

National Automobile Chamber of Commerce, 366 Madison Avenue, New York, N. Y., has issued general bulletin No. G1053, listing price changes for passenger cars, motor trucks, motor buses and taxicabs since March 15, 1925. Prices of all new models that have been brought out in that time are also indicated.

North American Cement Corporation, Hagerstown, Md., has issued a booklet entitled "Quick-Hardening Concrete." This is a practical consideration of products, methods, results and costs involved in the use of Cal-Concrete. Among the subjects discussed in this publication are the effect of accelerators on the strength of concrete, the effect of curing, and of the water ratio on the strength of the product, aids in waterproofing, intensifying, etc.

Bridgeport Brass Company, Bridgeport, Conn., has issued a leaflet setting forth the merits of its new traffic spots for permanent marking of traffic directions. It is pointed out that the Bridgeport Brass cup markers are permanent, while paint markings on the road or highway soon wear off and must be renewed.

ELECTRIC RAILWAY MATERIAL PRICES—April 13, 1926

Metals—New York

Copper, electrolytic, cents per lb.	13.95
Lead, cents per lb.	8.00
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.50
Tin, Straits, cents per lb.	63.75
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.225
Somerset mine run, Boston	1.95
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.325
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.25
Sheet iron, galvanized (28 gage), cents per lb.	4.50
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.00
White lead in oil (100 lb. keg), cents per lb.	15.50
Turpentine (bbl. lots), per gal.	$0.98
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4-6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.625
Light copper, cents per lb.	9.625
Heavy brass, cents per lb.	7.25
Zinc, old scrap, cents per lb.	4.625
Lead, cents per lb. (heavy)	7.00
Steel car axles, Chicago, net ton	$17.75
Cast iron car wheels, Chicago, gross ton	16.75
Rails (short), Chicago, gross ton	17.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	8.50

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ElectricRailway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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The $6,000,000,000 Won't Be Wiped Off the Books

TWO men recently expressed their views on the electric railway situation. They spoke in the same state but in different cities; one in St. Louis and the other in Kansas City. They represented two points of view on electric railways—one reactionary, the other progressive. They based their opinions on their experience with electric railways—one failure, the other success. Their conclusions follow the same deadly parallel. One said that the $6,000,000,000 investment in electric railways should be wiped off the books as a loss. The other expressed confidence in their future and outlined the steps by which the industry is definitely winning its way back to prosperity. What a contrast there is between the point of view expressed by L. F. Loree, president of the Delaware & Hudson Railroad, and that of Britton I. Budd, president of the Chicago, North Shore & Milwaukee Railroad!

Speaking before the Chamber of Commerce of St. Louis in the interest of the proposed combination of Southwestern steam railroads which he and his associates are attempting to put through, Mr. Loree apparently went out of his way to deliver his funeral oration for the electric railway industry. So unfair was this statement that it was difficult to believe a man in Mr. Loree's position would make it. The JOURNAL went to great pains and no little expense to check the accuracy of the reports. Unfortunately, no stenographic record was made, but the accounts of several reliable and experienced reporters agree very closely. According to the JOURNAL'S own correspondent who attended the meeting, Mr. Loree expressed in no uncertain terms the opinion that the country could "wipe off the books the six thousand million dollars invested in electric street and interurban railroads because the automobile, truck and motor bus had placed them in the discard as effectively as the steam railroad shelved the stage coach and stage coach tavern during the last century."

In the very audience he addressed were several of the men who are even now engaged in negotiations for combining the bus and street car in St. Louis to give a modern co-ordinated service. The people of that city have come to see the wisdom of such a co-ordinated transportation system. The public officials have come to see the importance of the electric railway as the mass transportation agency. And incidentally the bus system there, operating independently of the rail lines at a higher fare, has not been conspicuous by a favorable balance sheet. It has been generally recognized that combination and co-ordination of the two systems is essential to the financial success of the buses as well as the rails.

It may be that the speaker was not informed on the experience of St. Louis and the progress that has been made there in understanding the fundamentals of properly co-ordinated local transportation. But if he was, it is difficult to understand what process of reasoning he employed in coming to the conclusion that $6,000,000,000 of electric railway investment should be dumped in the scrap heap.

Rather a sizable investment this is to wipe off the slate so unequivocally! When a man who occupies so prominent a position in the public eye, the transportation world and financial circles makes so sweeping a statement about so important an industry, it is imperative that his qualifications to speak as an authority on this particular question be carefully examined.

There is no question of the position and success which Mr. Loree has won as a steam railroad executive. That very fact tends to add to the surprise and chagrin occasioned by his remarks on the electric railway situation. But should that necessarily follow? He is a successful steam railroad operator. He is also the owner of several electric railway properties. And there lies the explanation for his St. Louis statement. Mr. Loree undoubtedly sees the electric railway industry through glasses darkened by the record of his own properties. Just how dark are these glasses is shown by the statement published elsewhere in this issue from the annual report of the Delaware & Hudson Company.

Dark indeed lies the future of the properties whose chief executive has the point of view expressed in St. Louis! And such a point of view represents in a sense both cause and effect. Mr. Loree owns electric railway properties to be sure, but he does not believe in them and he probably never did. There lies the alpha and the omega of their difficulties. The Delaware & Hudson, much as in the case of the New York, New Haven & Hartford and other steam railroads, acquired electric railway lines to control all the transportation facilities in their territories. But they did not believe in the electric railways and the hand of control proved to be a heavy hand that stifled development. The Connecticut Company was in much the same position under the New Haven as are Mr. Loree's electric railways under the Delaware & Hudson. After the federal dissolution degree which split the Connecticut Company from the New Haven, Mr. Storrs was able almost entirely to reverse the situation of his property. Recently the New Haven has been permitted to take back the Connecticut Company. It has also retrieved the Worcester and Springfield system. But its executives have learned their lesson. Millions of dollars are to be poured into these properties in a program of rehabilitation and development.

The electric railway industry has come through a period of most profound difficulty and suppression. But so also have the steam railroads! And merely in pass-

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ing it may be worth adding that the electric lines are more than three years ahead of the steam roads in adopting the bus instead of vainly trying to kill it. Mr. Loree looks with optimism toward the future of the steam roads and is even now engaged in trying to put through a large consolidation in the Southwest. But he doesn't see any future for the electric railways and he probably doesn't want to see it. He bought electric railway lines—yes; but he bought them for control —not development.

In his own book, "A Century of Progress," he recounts the affairs of the Delaware & Hudson Company. There he tells part of the story of his electric railway difficulties. But from that account there is no basis for the conclusion that the conditions are unsurmountable. In his foreword to that volume Mr. Loree quotes the words of Ruskin, "When we build let it be such work that our descendants will thank us for." But the building of such a structure requires a breadth of view such as the author has not acquired in considering the electric railways.

Thus his words at St. Louis lend themselves to explanation and interpretation. The incongruousness of the situation developed there begins to clear up in the light of better understanding of the speaker's point of view. Electric railway men have been accused—and in some cases with cause—of taking a similar point of view relative to the bus. There has been some basis for the feeling that certain electric railway men while adopting the bus have continued to consider it as a stepchild and have been more interested in its death than in its development. For this reason electric railway men may readily understand Mr. Loree's viewpoint.

But as to the future of the $6,000,000,000 investment, there is growing evidence that the situation is improving each day. In bright contrast indeed are Mr. Budd's remarks made in Kansas City and printed elsewhere in this issue. In bright contrast are the records of the properties that he heads. In bright contrast also is the viewpoint of the management of the Chicago Surface Lines as discussed in an article printed elsewhere in this issue. That $6,000,000,000 won't be wiped off the books and its security is growing by leaps and bounds!

An Epidemic of Erroneous Views on the Car and Bus Situation

JUST now it seems to be popular to predict the early disappearance of the electric railway. Mr. Loree's pronunciamento is only one instance. Others will readily be recalled. One of the most conspicious was the report, two months ago, that the electric railway cars in New York were to be superseded generally by buses. The report was based on a bad misunderstanding of the bus franchise situation in this city, but it received considerable publicity in the daily press throughout the country. The JOURNAL called the industry's attention to the situation and urged transportation men to correct this untruth by giving as much publicity as possible to the facts.

New York is not the only city about which similar false statements have been published. Others, both in this country and abroad, have been evolved without a particle of fact to justify the assertion. There seems to be an epidemic of false publicity on this particular point during recent weeks.

Where wild statements are made that large cities in this country will change from car to bus, electric railway men familiar with the situation can readily correct the error. It is not quite the same when these remarks are made about large cities abroad. Authentic information is more difficult to obtain. It is therefore satisfactory to state that there has been no such change in either London or Berlin, the two foreign cities about which rumor has been most persistent on this score.

An account of the London situation was published in this paper two weeks ago. A letter on Berlin conditions appears in this week's issue. Recently, a dispatch purporting to come from Berlin and stating that buses were about to be substituted for tram cars in that city was widely published in the daily papers in this country. Promptly upon the appearance of the statement, this paper cabled to the Berlin Street Railway for the facts. They are given in a letter by the operating head of the company, Mr. Pforr, published on page 725 of this issue. Not only is the surface street railway not going to be abandoned but it is carrying an increasing number of passengers yearly and continues to remain the principal agency for local transportation in Berlin.

The frequent publication of the statement that electric railway transportation is becoming obsolete is doing harm to both railways and buses. It is the duty of every one interested in the local transportation industry to correct this error by getting the facts before the public. The bus has a rapidly growing field of usefulness, but its future is endangered by unwise attempts to apply it in service for which it is not adapted. Low cost mass transportation is not the place for the bus.

Galveston Convention Marks New Milestone in the Progress of City Transportation

PROGRAMS at railway meetings only a few seasons ago consisted largely of maintenance talks. Today, thanks to the automobile, the transportation manager is far more concerned with selling transportation. For several years he has been groping about to discover ways and means of increasing traffic, and, naturally enough, attention has been focused on advertising, publicity and public relations work. On many properties trained men have been employed and departments started to accomplish these results.

Something more is necessary. There must be a product to sell that equals or exceeds that of its competitors. This thought has fast been permeating the industry. It was forcefully recognized in several of the forward looking talks at the Galveston convention of the Southern Public Service Association.

Every talk and paper in Galveston had one common meeting point, namely, the elimination of such parking and garaging of automobiles as prevents today the faster operation of cars on our congested streets.

George H. Clifford said we need not concern ourselves with the saturation point of the private automobile. There will be a saturation in effect due to street capacity, and while automobile sales may go merrily on, the railway and bus line must serve as common carriers for business purposes and take care of the natural growth in traffic for some years, partially counteracted by wild strides in automobile usage.

Frank R. Coates pointed to the traffic problem as one that calls for solution by the combined efforts of those

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who know the problem best—the railway engineers and the police authorities. The work in Chicago is an example of outstanding merit. In less than two years elimination of left-hand turns and a scientific regulation of traffic accomplished marvels.

Stanley Good, captain of traffic police in El Paso, told how traffic officers there are acting as public servants to eliminate accidents. A violator of traffic is approached in El Paso in a manly and courteous manner and told that the traffic rules are made for the purpose of protecting every one alike. No coarse "bawling out" is permitted. Such action on the part of an officer only serves to rouse the anger and enmity of the offender.

Herbert B. Flowers stated in no uncertain terms that speed is the essence of the transportation problem today. When common carriers can offer a safe ride in a comfortable vehicle at higher rates of speed, the traffic will naturally be increased. This means a lot of things, cars geared to accelerate more rapidly, equipment and tracks that will accommodate such speed, and a clear way on the streets.

Not that maintenance and public relations are of less importance today than a few years ago, but service to the public is so momentous a feat to be accomplished that it may rightfully be expected that this basic necessity will stand in the limelight at future meetings.

And so rapid has been the progress that by the time of the Cleveland convention next October it is not too sanguine a hope that some city—perhaps several—will come to that meeting with reports of real results in the wholesale elimination of parking and of rededication of the streets to the transportation of its citizens.

Why Cater to One Customer Out of a Hundred?

REFUTATION of the argument so frequently advanced by retail store proprietors that parking of automobiles in front of their premises is necessary to secure the most desirable class of customers is found in a traffic count made recently by four large department stores in the Loop district of Chicago. The figures are summarized in an article in this issue on page 722. It was arranged that checkers should interrogate only those customers whose appearance indicated that they were likely to use motor cars. Out of a total of 15,229 such persons 1,680 arrived in automobiles, and but 716 of these drove their own cars. Included in the number of those who came by automobile, 151, or 9 per cent, parked on public streets or alleys within reasonable walking distance.

When out of a large selected group such as this less than 1 per cent used the near-by streets for parking, the absurdity of the old argument is apparent. It would have been even more interesting to find out what proportion of all the customers parked their cars on the streets. Such a figure would undoubtedly have been much lower.

Transportation men in other cities who have had difficulty in getting suitable parking regulations adopted and enforced will find much interest in these figures. Similar tests made in other cities probably will show results comparable with those in Chicago. Such information will do more to convince the merchant that parking works to his detriment than any amount of unsupported argument.

The Common Touch Often Delivers a Knockout Blow

EASY enough it is to "walk with crowds and keep your virtue"—but when it comes to riding with mobs in the New York subway nature demands her price, sometimes in the form of a dislocated shoulder and at other times in the sacrifice of an errant arm. A wounded leg is the penalty recently meted out to a wealthy straphanger of fourscore years and five who was bowled over by an impelling and compelling rush-hour crowd. Although scarred at the hands of the mob, he is not scared of them and would willingly turn the other leg for a similar scourging. Such loyalty to so hazardous a transport system is outstanding, but this aged capitalist has said often that he prefers the noise and crowding in the subway to privacy and comfort in a limousine because he wants to mix with the "masses." He hadn't counted on the impression, often lasting, that this common touch leaves with the seekers of local color. Then, again, subway riding gives him a chance to think, he claims, and thinking in a Rolls Royce is rare.

Of course, his fellow camaraderie-in-straps cannot be accused of ignorance for not recognizing the richest subway advocate; they're so preoccupied reading of wealth to be distributed among homeless chickens and wild birds that they failed to note the position of the prodigal in their midst. If they had, he would undoubtedly have forsaken his subway slogan and have finished the trip downtown to his office in an airplane, bicycle or even in an ambulance, if necessary. Some fine day when the elasticity of the nickel fare snaps this side of South Albany the optimism of this octogenarian will fail him. Then there will be more breathing space in the subway and a place for another pair of weary feet.

Performance Comes Up to Expectations on Interstate Railway

FIGURES now available for seven months operation of new cars bought last year by the Interstate Street Railway, Attleboro, Mass., show a reduction of nearly one-third in the cost of operation. Moreover, the gross earnings have shown a substantial increase during this period. While these developments are quite in accord with the hopes of the new management at the time its modernization program was undertaken, in certain respects the actual results have somewhat exceeded expectations. Details of costs and earnings are given in an article in this issue.

Modernization on this property has not been confined to the purchase of new rolling stock. Operating methods have been brought up to date. Service has been improved in speed and regularity. Buses are used extensively. Good public relations have been established, and the management has done everything possible to make its employees contented. The results of this policy may be seen in the courteous and careful manner in which they perform their work. An exceptionally good accident record has come largely as the result of the whole-hearted co-operation of the trainmen.

Although faced with serious competition, the Interstate Street Railway has built up its traffic on account of its superiority of equipment and service. All in all, the experience of this company is an excellent illustration of the successful application of modern operating methods to the problem of the small electric railway.

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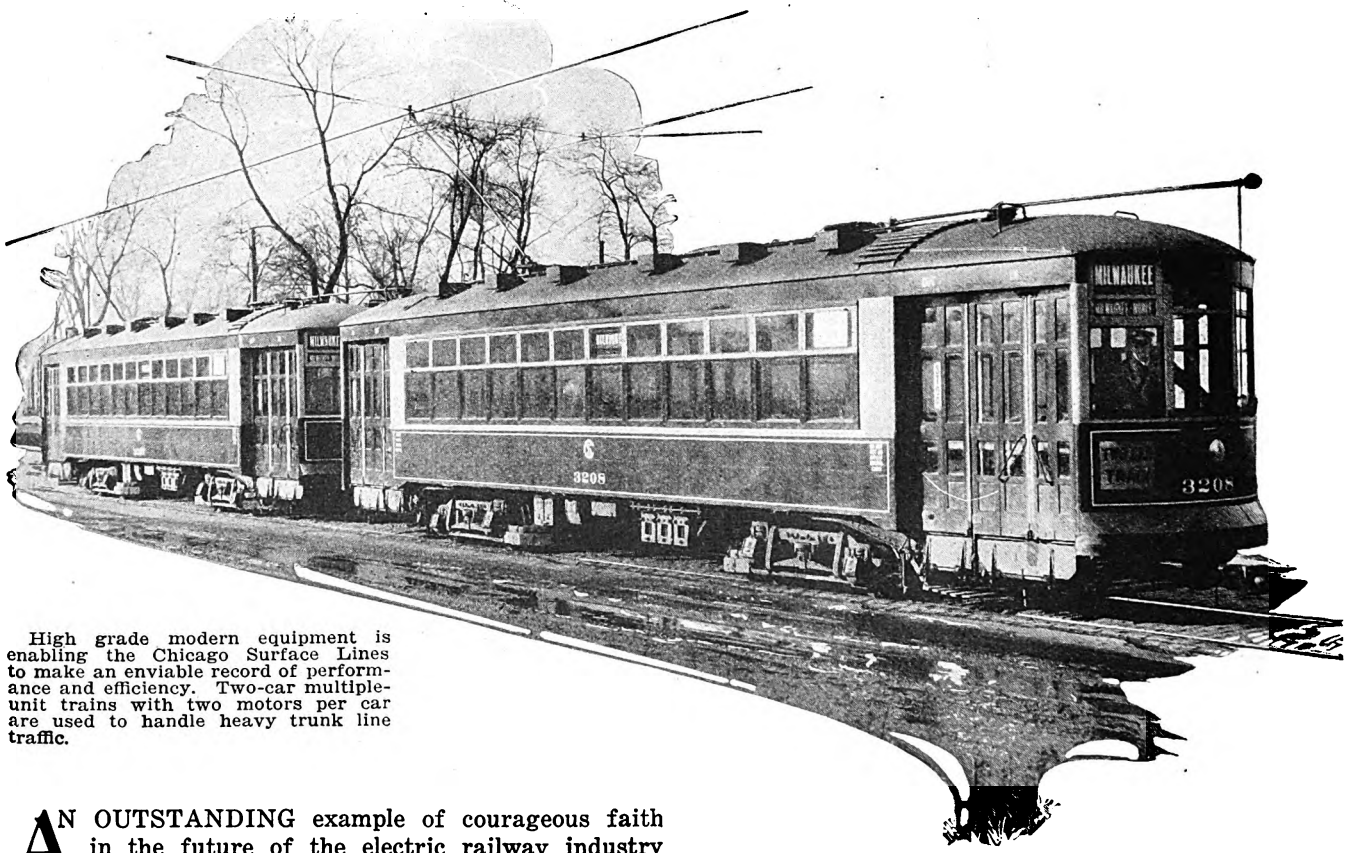
Full Speed Ahead with Expiring Franchise

Chicago Surface Lines Maintains Policy of Building Up Property and Improving Service as Franchise Expiration Approaches—Supported by Faith in the Future of Electric Railway Transportation

By Charles Gordon



High grade modern equipment is enabling the Chicago Surface Lines to make an enviable record of performance and efficiency. Two-car multiple-unit trains with two motors per car are used to handle heavy trunk line traffic.

AN OUTSTANDING example of courageous faith in the future of the electric railway industry and in the basic soundness of the position occupied by the street car in the development of American cities is afforded by the policy pursued during the past few years by the management of the Chicago Surface Lines. In less than a year the franchises of these companies will expire. After the 31st of next January —unless new franchises are granted in the meantime— the properties will have no legal rights in the streets of Chicago. There would then remain as protection of the investment only the necessity for transportation service in the city.

In many cities the gradual approach of such a situation as now exists in Chicago has been accompanied by the serious deterioration of railway properties. With no franchise renewal basis determined, a major retrenchment policy has in the past been adopted by many managements. In most instances this has been accompanied by deferred maintenance of equipment, curtailment of service and serious loss of morale in operating organizations.

But a different program has been followed by the Chicago Surface Lines under its present management. This largest surface property in the country is today functioning at the highest stage of efficiency which it has been possible to attain under the circumstances. Its business is growing steadily and rapidly. Relations between the management and its men, between the various departments and groups within the organization and between the company and the public it serves indicate a gratifying spirit of understanding and cooperation. Everywhere there is evidence of confidence. The company has succeeded in building up a general understanding of the fact that its welfare and that of the community are inter-related. These conditions are reflected in the statements and action of public bodies and in the attitude of the press in the community served.

Brought About by Point of View

How has all this been brought about? What has led the management to adopt a major improvement program in the face of an expiring franchise? Wherein lies the secret of the confidence that has been established among the many diverse groups interested in the

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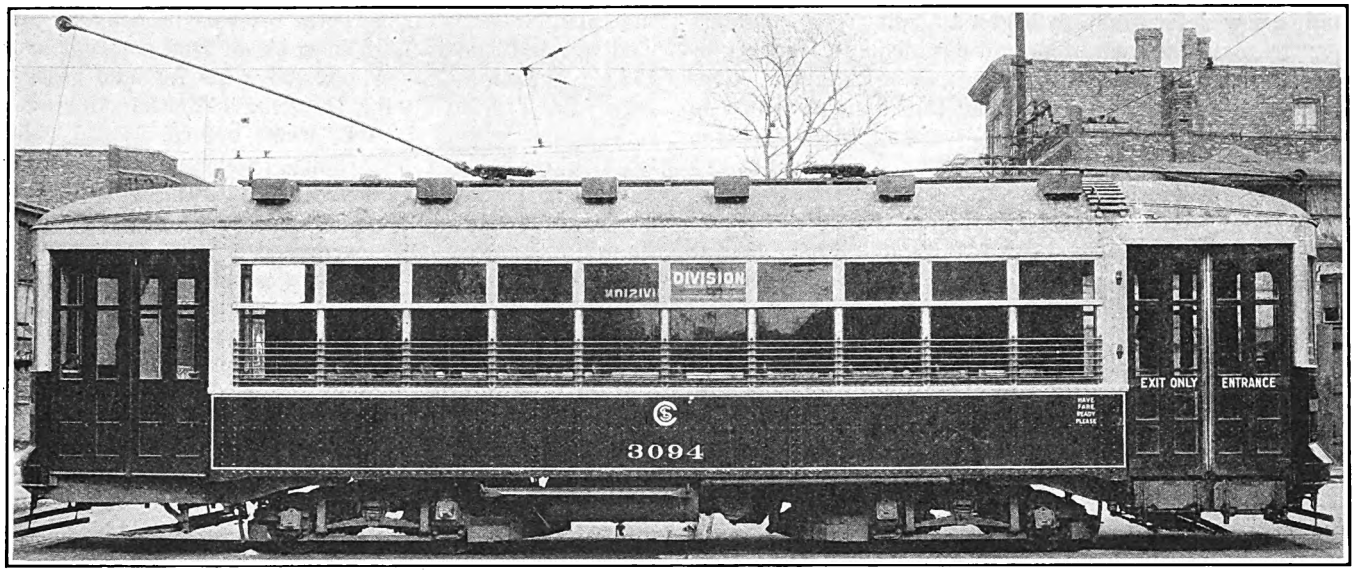


Equipment Is Provided to Meet the Requirements of Various Classes of Service. This Type of Double-Truck One-Man Car Has Helped to Make Many Satisfied Riders

Chicago transportation situation? The answer is simple. It can be summarized in four words—A point of view.

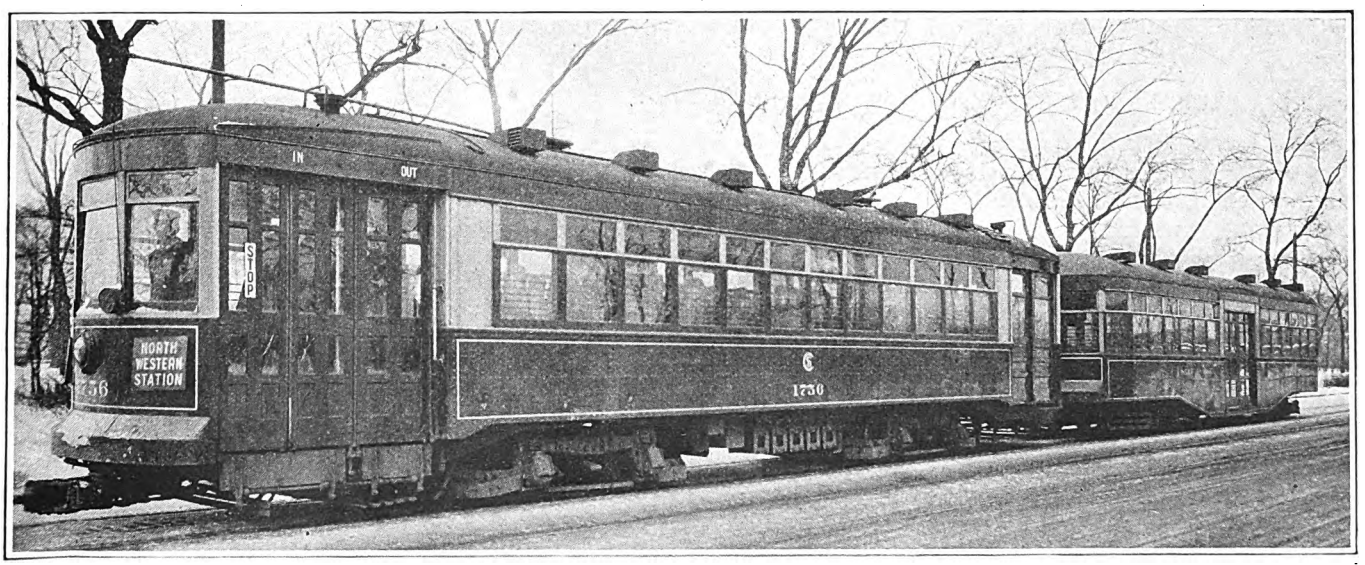
Most important of all, there is confidence on the part of the management in the street car as a basic necessity in community development. This viewpoint provided the courage necessary to proceed with improvement despite the expiring franchise. During the past three years 342 new cars have been purchased. In the same period 15 miles of new track extensions have been made and 95 miles of track have been reconstructed. At the present time, with the franchise expiration date only a few months away, the company is negotiating for the purchase of another group of new cars.

The management's view of employee relations is based on the principle that the workers have a major interest in the welfare of the property through the investment of years of service rather than dollars. On this basis there has come realization by employees that their interest in protecting the desirable and honest worker and in eliminating those found to be undesirable is identical with that of the management.

Public relations has been viewed first as a performance problem. Public good will has been solicited only on this basis. Step by step improvement demonstrated the sincerity back of the management's point of view. As these improvements were put into effect a sense of difference permeated the community. This first aroused interest, then invited confidence, and finally developed hearty support from many important elements in the city.

Financial and engineering problems have been far from simple. But the greatest achievement is not the application of more scientific schedules, or the improvement of the physical property, important as these are, but the upbuilding of a spirit of co-operation brought about by application of the management's point of view to the handling of the many intangible factors in human relations. The principle of "service first" has been transmitted to the officials and employees of the company on the one hand and to the community itself on the other. Out of it has developed confidence, enthusiasm and the co-operation which made all other accomplishments possible.

Like most street railways in the country, the Chicago Surface Lines did not recover from the strain of wartime conditions until long after the armistice. It was in 1923 that the organization with new management



The Use of Motor-Trailer Trains Has Proved Advantageous on Lines Having Very Heavy Industrial Peak Loads for Short Periods During the Day

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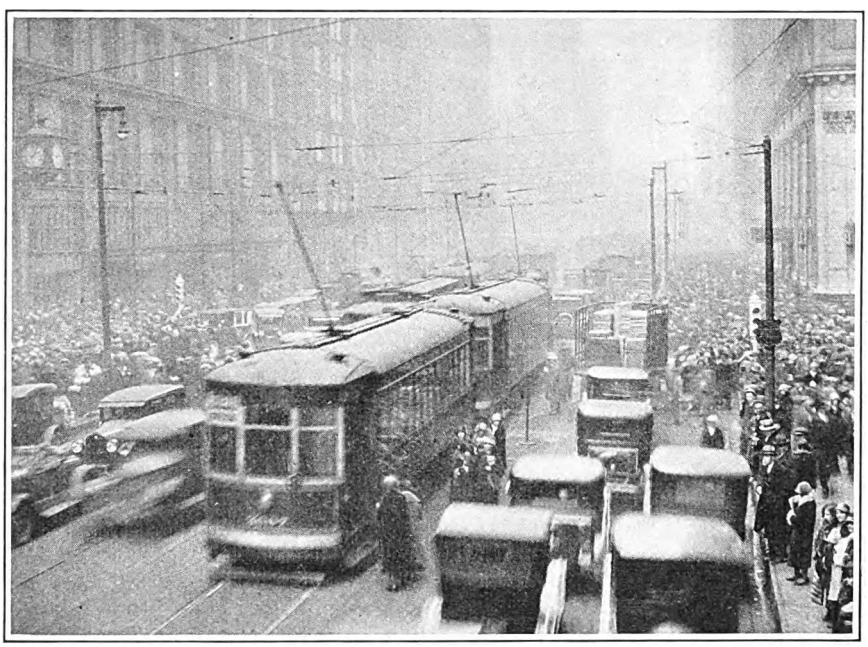
and a new determination began to square its shoulders for the man-sized job of providing adequate transportation for three-fourths of the people of Chicago. Conditions were discouraging. The impression seemed to prevail that the street railways were fading out of the transportation picture.

Under the impetus of the new point of view, the situation changed. Loose operating practices were discovered and eliminated. Scientific traffic analysis was undertaken for the purpose of improving service. Schedule making was modernized and made responsive to the needs of car riders. Improvements were made in the methods of selecting and training employees. Additional equipment was provided, and increased service put on to relieve crowding on the cars. Today the property is facing the expiration of its franchises with a harmonious organization, an enthusiastic body of em-



The Time Required for Cars to Pass Through the Chicago Loop District Has Been Cut in Half by Improved Routing and the New "Wave Light" Traffic Control System Originated by E. J. McElraith of the Chicago Surface Lines. Heavy Traffic on State Street Is Shown

ployees, one of the finest physical properties in the world, and an alertness to its opportunities and responsibilities that has won the frank admiration of the very community which now is called on to determine its future.

Operating Figures Show Healthy Condition

The extent to which Chicago succeeds in bringing about action by its representatives that properly reflects the present public attitude and the interests of the car rider will determine the wisdom of the policy adopted by the railway management. No one can now foresee the outcome. In Chicago there is being staged a major experiment in public relations. In the forthcoming franchise negotiations, one of two things will be demonstrated—either that American public representatives are essentially fair in recognizing efficient public service, or that in Chicago at least private capital invested in electric railway service may not expect the same consideration accorded other business enterprises. The issue is clearly drawn. There is no question of the condition or performance of the property.

A rough measure of the results accomplished during the past three years is given by operating figures for the calendar year 1925. Total revenue passengers carried were 840,992,639, an increase of 10.9 per cent over 1922. Approximately 83,000,000 more revenue passengers were carried during the year 1925 than during a corresponding period three years before. Total rides for the year were 1,515,572,630. Revenue rides during 1925 were 1.3 per cent above the figures for 1924. Increase in service is represented by an increase of more than 1,000,000 car-miles operated during 1925 in comparison with 1924. During a period of three years, through the addition of 342 new cars and the more efficient use of equipment, 12,000,000 car-miles of service have been added to build increased riding.

Gross earnings increased 1.17 per cent in 1925 over 1924. Net earnings increased 8.78 per cent despite the large increase in car-miles operated and a higher wage to trainmen. This in itself is indicative of greater efficiency in operation. A measure of the condition as well as the efficiency of the entire property is given by the performance during the shopping period immediately preceding the Christmas holidays. During the peak load period 99.8 per cent of all cars owned were in operation. In other words, all but seven of the 3,539 cars on the system were out on the street doing their bit carrying the enormous traffic load, which on the busiest day reached a total of 2,820,704 revenue passengers or 4,971,129 rides, including transfers. On the basis of this performance it is quite evident that the equipment was in good condition.

One of the earliest changes made by the present management was a readjustment of the transportation department. A forcible policy of giving service wherever and whenever needed was inaugurated. Schedules were prepared in so simple a form that new men as well as regular men could easily understand the details of the day's work. Supervisors' guides are provided in convenient pocket size, so that each supervisor, starter or division superintendent has in handy form a correct and complete record of each schedule. Other necessary schedule information is compiled in a form convenient for use at carhouses. In other words, all working information is put into such form as to facilitate the work of those responsible for the accurate spacing of cars.

Scientific schedules made it possible to operate cars on time and keep them there. This led to greater regularity of service. Variations in traffic conditions and other factors affecting the operation of cars were taken into account in compiling the basic data. Trainmen quickly recognized the improvement. A respect has developed for schedule making that results in greater interest on the part of the trainmen in keeping cars on time and maintaining a high standard of operation. More uniform passenger loading and a reduction in switchbacks soon resulted.

Schedules are kept up to date by close supervision and careful checking. As riding habits change—they have changed very rapidly in some sections—schedules are revised to meet the new demands. On some lines during the past three years riding has doubled. Only

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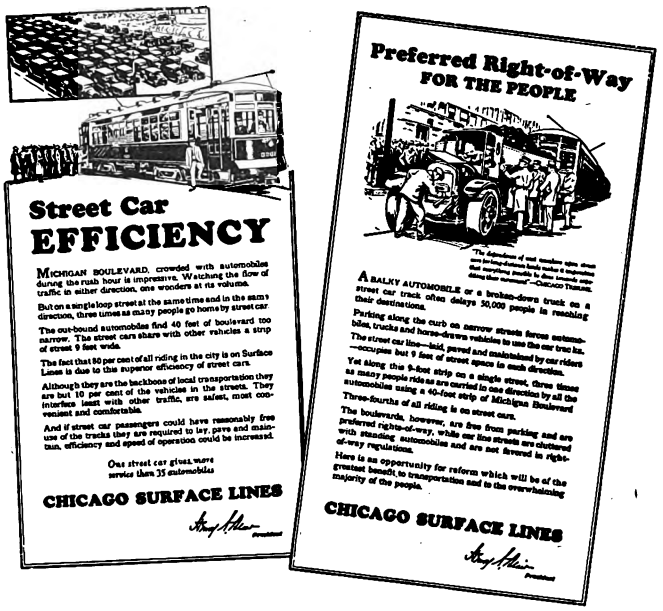
by constant vigilance has the service been kept adjusted to the requirements. The supervisory force has been trained to act in emergencies and to take the initiative in any situation to minimize disturbance of schedules. A constant effort to improve performance is the major objective. Division superintendents are required to make personal observations of the performance of various lines in their territory. Regular supervisors' weekly group meetings with the superintendent of transportation are a feature of the department's activities.

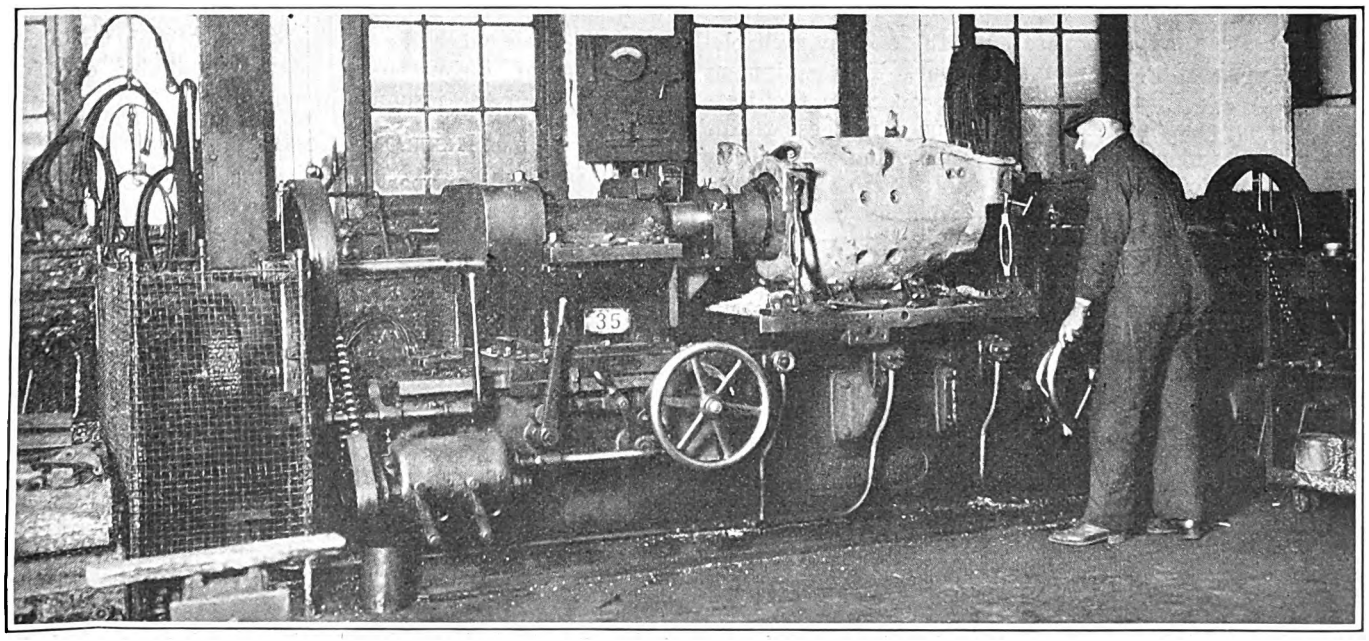


Laying the Facts Before the Public in Newspaper Advertisements
At left, street cars, constituting only 10 per cent of the vehicles in the streets, carry 80 per cent of the passengers. At right, street car riders are entitled to traffic regulations that will expedite the movement of cars.

This same close contact has been established between the management and the men on the platform. Frequent group meetings addressed by the superintendent of transportation, the supervisor of accident prevention and others are held in all the carhouses. At a series of such meetings held recently at each of the carhouses, the superintendent of transportation and his assistants discussed with the trainmen the details of the platform man's duties and obligations. That the men appreciate this contact and grasp the point of view presented is indicated by the attitude of the local union as expressed in its official paper, the *Union Leader*. "Imagine the change from the old days," that paper said editorially, "to have the superintendent of a big system like the Chicago Surface Lines hold daily meetings with the trainmen to discuss and advise how to improve service. . . . Emphasis was placed on the fact that conductors and motormen are engaged in the business of selling transportation, and that coming as they do into direct contact daily with the persons who buy this transportation, they can do a great deal not only to make their work easier, but to promote the business in which we are all interested. The difficulties which arise from the use of intoxicants, carelessness in registering fares, and unnecessary accidents were also pointed out by the speakers, with the plea that every employee do his utmost to discourage these practices. The importance of courtesy and neatness in appearance were also emphasized, together with the value of a cheerful and optimistic attitude which would help keep the system free from quarrels and the disgruntled feeling that always operates against good service. A strong plea was made for teamwork and good feeling between men on the front and rear ends of the cars, between crews on the street and crews and supervisors."

Highest Paid Men in Industry

The average present seniority of trainmen in the service is ten years, and more than 1,000 trainmen have been in the employ of the company for 25 years or longer. Under an arbitration award, trainmen were given an increase of 3 cents an hour beginning June 1, 1923, and an additional 2 cents an hour beginning June 1, 1924. Under another award, most of the shop and electrical employees received an increase of 10 cents an hour, trackworkers 6 cents an hour, and other labor 3 cents an hour beginning Aug. 1, 1923. The present pay of trainmen, with a standard maximum of 75 cents an hour, is the highest received for platform service anywhere in the country. This high labor cost has been met without an increase in fare only through the appli-



Modern Shop Machines Help to Reduce Maintenance Costs. This Four-Spindle Boring Machine Has More than Paid Its Way in Overhauling Motors

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cation of more efficient operating methods and by increasing the number of revenue riders that have been attracted by the improved service.

The Chicago Surface Lines owns 1,072 miles of single track, of which 218 miles have been built since the passage of the 1907 ordinances, under which the company now operates. Practically all of the track on the system at the time of the adoption of the 1907 ordinances has been reconstructed. Track construction and reconstruction since 1907 averages approximately 60 miles per year. The track has been well maintained and is in splendid condition. Buildings are well painted and in good repair.

There are 1,072 miles of single-track trolley wire, 95 per cent of which is No. 000 B. & S. gage round wire, the rest being No. 00 size. This latter is being rapidly replaced with No. 000 wire. During the past twelve years 2,105 miles of trolley wire have been strung for renewal purposes, an average of 175 miles of wire per year. Trolley wire has been renewed, therefore, on the basis of an average of once every six years.

In the loop district service is extremely heavy. No. 000 Phono-electric wire is used generally in this district. The average life of a trolley ear is about 30 days under this heavy service, and the wire must be replaced every two years. Economies in the electrical department have made it possible to install wire at practically the same cost today as in 1907. Both line and emergency vehicles are entirely motorized.

Equipment Fits Various Classes of Service

There are 3,539 passenger cars on the property. Of these 2,638 are four-motor double-truck equipments, 790 are two-motor double-truck, eleven are single-truck, 99 are trailers and one is a three-truck articulated unit. All cars are electrically heated with thermostat control. They have been entirely equipped with modern ventilating apparatus approved by the health department of the city.

Most of the cars in service are of the two-man double-truck type. On certain heavy trunk lines train service is operated. On the Madison Street line motor cars and trailers of the types shown in an accompanying illustration are used. Similar trains are used on the heavy Halsted Street and Cicero Avenue lines during rush hours. On Milwaukee Avenue, which is a very heavy diagonal street, train service is operated with two-car, multiple-unit trains having two motors per car. This equipment is provided with automatic treadle doors to facilitate the exit of passengers. The cars used in these trains are also arranged for individual operation with either one or two men, and on one of the principal crosstown lines of the city one-man operation is carried out. Thus, various combinations of equipment are used to fit the requirements of different classes of service.

Equipment maintenance standards in Chicago are constantly being raised. During the past year, overhaul periods have been reduced to two years. In 1925, 1,467 cars were overhauled in comparison with 1,000 cars the preceding year, or an increase of 46.7 per cent. At the same time, average cost per car for overhauling was reduced 45 per cent.

Cars are overhauled in accordance with specifications prepared by the engineering division of the equipment department. Inspectors are maintained in both shops of the company to make sure these specifications are carried out. Special portable instruments are used for checking electrical equipment at the sixteen carhouses on the property so as to detect weak spots in equipment before failure occurs in service.

In carrying on the details of maintenance, particular attention has been given to the development of dies, tools and fixtures for the reduction of labor costs. In many cases special tools have been developed for specific operations. An example of this practice is the four-spindle boring machine shown in an accompanying illustration which rebores the four bearing housings of a car motor in six hours.

A continuous process of standardization is carried on in the equipment department. In this way the number of different types of journal boxes, brakeshoe heads, brakeshoes, brush-holders, brush-holder yokes, air compressors, engineer valves and many other items have been standardized so as to reduce the number of parts that are required for stock, while at the same time eliminating much lost motion and confusion.

Improved maintenance is reflected by the reduction in pull-ins. For November, 1925, the number of miles operated per equipment failure was 132 per cent greater than for the corresponding month of the previous year.

Economies in Auxiliary Departments

In such activities as the purchase and handling of materials, marked economies have been effected. In purchases totaling $6,000,000 annually and necessitating the issuance of more than 17,000 separate purchase orders, there is ample opportunity for waste and inefficiency. This is overcome by the careful compilation of data concerning materials required. Inquiries to jobbers and manufacturers show in detail such information as will enable sellers to quote confidentially their lowest price. The cost to purchase $1,000 worth of material is $4.15. This is claimed to be the lowest of any street car system in the larger cities of the United States. The average value of materials and supplies carried in stock is $3,000,000. All materials are disbursed from storerooms and yards that are up to the standard of high-class department stores in orderliness and neatness. Many labor-saving devices have been applied in the handling of stores and materials.

On Feb. 1, 1924, the cost to operate the materials and supplies department was $0.004 per revenue car-mile operated. This has been reduced to such an extent that for the fiscal year ended Feb. 1, 1926, it was $0.0025 per mile operated. The saving was made by the consolidation of disbursement centers and by careful supervision of the issuance of materials.

Insurance Costs Cut

The insurable property is protected by about $60,000,000 in fire insurance. Good housekeeping methods and the institution of an inspection system for its maintenance have contributed to a reduction of more than 40 per cent in the cost of carrying the insurance. Shops and important carhouses are inspected at least once each week, and a thorough inspection of all properties is made from roof to foundation at frequent periods.

Similar improvements have been made in the accounting, engineering and other departments. All have resulted from the effort to increase efficiency and improve performance.

Publicity and advertising are used to inform the public of the progress made and to point out the objectives of the management. The success of this effort is illustrated by many instances that reflect the improved public point of view. A campaign was inaugurated for

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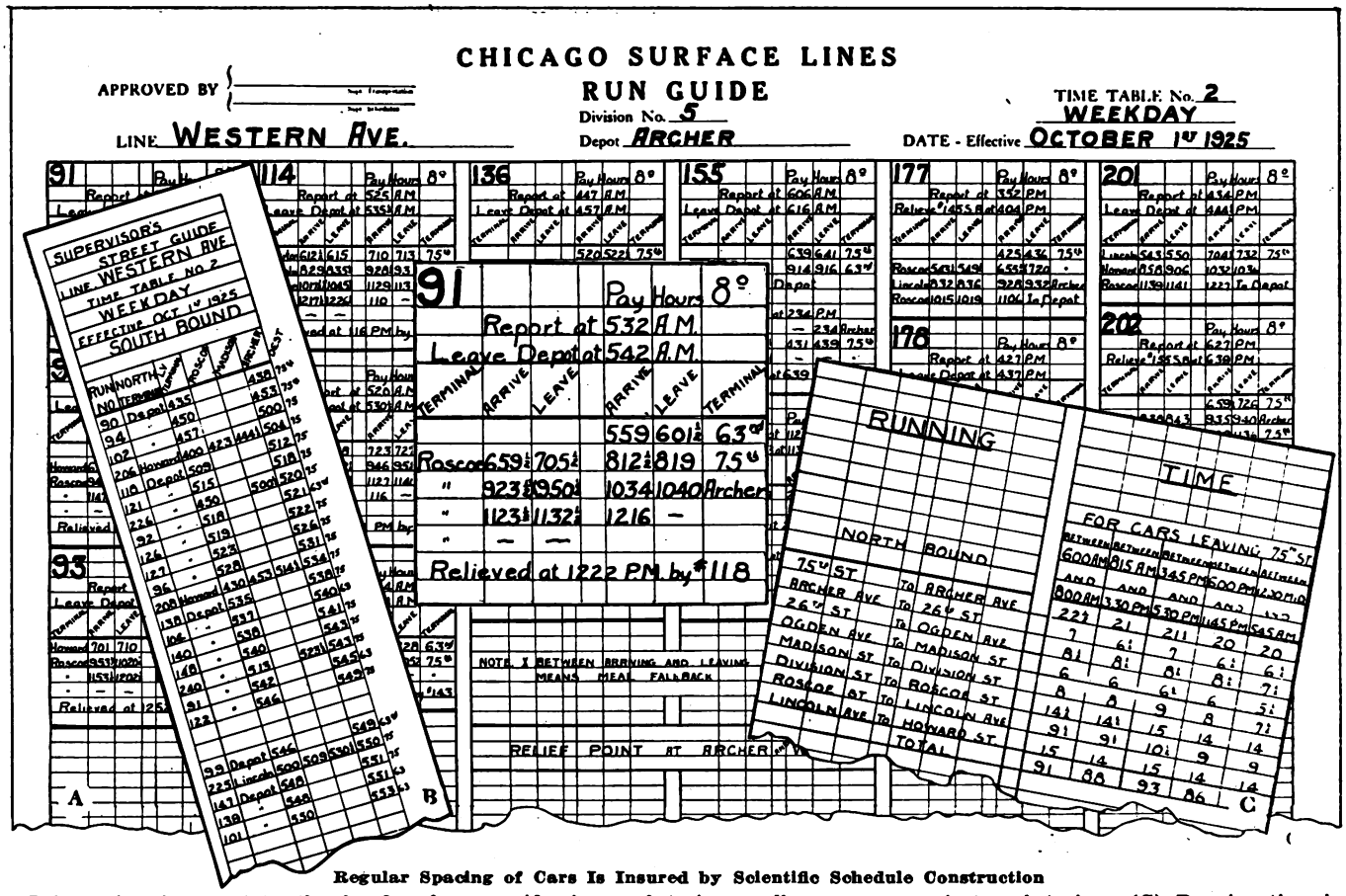
the elimination of parking in the congested districts, where parked automobiles forced all vehicles onto the street car tracks. A series of advertisements in the newspapers and in the cars pointed out the inconsistency of giving up a strip of street 8 ft. wide along each curb in congested centers for storage purposes. Attention was also called to the fact that along the narrow strip of street used by the street cars three times as many people are carried in a given length of time as ride in all the automobiles on a wide boulevard.

The company took up actively the interests of the car rider. Its publicity material pointed out that the car rider not only lays the track but paves, maintains and



Regular Spacing of Cars Is Insured by Scientific Schedule Construction

Information is put into the hands of trainmen and supervisory forces in the form considered most convenient. (A) The run guide gives each trainman all necessary information in simple form. (B) One section of a supervisor's street guide in convenient pocket size. (C) Running time is varied to fit traffic at various periods of the day and sections of the route.

cleans the part of the street which he uses, and is therefore entitled in simple equity to preference in the use of that portion of the street. Publicity material has likewise been directed to other phases of street car service.

Backed Up by Performance

All of this, however, has been backed up by daily performance and consistent improvement in the service. Newspapers which three years ago were unmeasured in their criticism of the service and the physical property have changed their attitude completely. The Chicago *Tribune* expressed the new attitude recently when it said in discussing the Surface Lines: "They do well just about everything that surface lines can do." Politicians who formerly rode into office on waves of indignation stirred up against the street car system are either silent or commendatory. Mayor Dever has repeatedly said, either in so many words or in substance, "These lines are probably the best physical properties in the entire world. The equipment is good and the roadbed is the best to be found anywhere." The Chicago *Post*, in an editorial on March 22 commenting on the accomplishments of the property, said: "The record of the street car lines is one of the truly constructive achievements in the city's recent civic annals."

Better public relations are evidenced by the degree of co-operation extended by public officials and newspapers in movements in which the car riders are interested. It was with the co-operation of the city government and the Illinois Commerce Commission that the 1924 rerouting plan which was described in detail in the May 3, 1924, issue of ELECTRIC RAILWAY JOURNAL was put into effect. Newspapers and city authorities are urging the regulation of parking. One paper voiced the general sentiment recently in an editorial when it said: "Dependence of vast numbers upon street cars for long distance hauling makes it imperative that everything possible be done toward expediting their movements." The superintendent of police has taken a definite stand in favor of the elimination of parking in the congested business sections. Co-operation between the city authorities and the company has recently resulted in the development and installation of a most successful system of co-ordinated traffic signals in the "loop" area of the city, which was described in detail in the March 27 issue of this paper.

The new attitude is also reflected in the character of complaints received by the company. Three years ago they were numerous and in general their tone was bitter. "Of course, you won't do anything about this, but" was a common expression. Complaints are now not nearly so numerous and they are more in the nature of helpful criticism. During 1925, with an increase

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of 1.3 per cent in revenue passengers carried, there was a decrease of 21 per cent in criticisms of service. The character of the complaints demonstrates conclusively that the public is convinced of the desire and determination of the management to give satisfactory service.

That a street car system approaching the end of its franchise and with no legal guarantee of future life should continue operation with all the vigor and enterprise of a young organization speaks volumes for the faith of the management in the future of the industry. It is quite evident that the management of the Chicago Surface Lines is thoroughly convinced that the street car is still a most important cog in the great city transportation machine. It has proved conclusively that the public will respond to improved methods of operation and the use of modern equipment. Under such methods it has found that riding has increased at a greater rate than population. It is building on the conviction that a street-car system can be made to pay. By the sheer force of performance, it is soliciting the public's good will. This largest street railway property in the country now enters the most critical period in its history, confident that the American public is essentially fair and that it may rest its case on the principle that he who serves best profits most.

Cleveland on an All-Substation Basis

BY L. D. BALE
Superintendent of Power Cleveland Railway

SERVICE from the one remaining power-generating plant on the system of the Cleveland Railway was discontinued Nov. 6, 1925, and the load assumed by automatic substations operating on purchased power. This station, known as the Viaduct power station, contained 8,100 kw. of reciprocating steam engine driven direct-current generators. It comprised an important link in the power production facilities of the system, supplying energy for the operation of all lines in the downtown area.

The passing of this plant to the junk pile marks the completion of a construction program which included seven automatic substations. It is also of interest to note that the entire power facilities of the Cleveland Railway now consist of manual and automatic converter substations, the alternating-current power supply being purchased from the Cleveland Electric Illuminating Company.

Three of the new automatic substations (Nos. 12, 14 and 15) are located around the immediate downtown or congested area. Three of the four remaining installations (Nos. 11, 13 and 16) are situated in areas adjacent to the territories served by the downtown plants. These three latter plants supply energy to the areas in which they are located, and also act as a safeguard for the continuity of power supply in the event of emergencies or failures occurring affecting the surrounding territories and particularly the downtown area. The fourth station (No. 10 and seventh of this group) is located in an outlying district where low voltage conditions were experienced.

The installed capacity of the new automatic substations is one 1,500-kw. synchronous converter in substations Nos. 10, 11, 13 and 16, the balance having two 1,500-kw. converters installed.

The power conversion facilities of the system, with the completion of this group of plants, consist of five manually operated substations having an aggregate capacity of 31,500 kw. and ten full automatic substations with a combined capacity of 24,000 kw. All the automatic plants are supplemented by a system of remote and supervisory control, including remote metering. This makes it possible for the load dispatcher, in the centrally located dispatching office in the Hanna Building, to supervise operations, thus obtaining the highest possible degree of operating efficiency from the plants involved.

Clever Car Cards Used on the Beaver Valley

REPRODUCED herewith are several of the "Just in Fun" series of car cards used on the Beaver Valley Traction Company. The text is snappy and keeps the patrons looking for the next appearance in the space. Every once in a while the company runs a serious message in the space and naturally gets it over.

As an additional feature, the company has run copy advertising the industries in the district, as illustrated by the two signs advertising United States Sanitary Manufacturing Company and the Guaranty Liquid Measure Company, both products manufactured in the territory served by the Beaver Valley Traction.

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Finding the Field of the Bus*

Transportation Companies Should Adopt the Bus to Meet Public Demand—Experience Shows More and More Its Capabilities and Limitations—Care Should Be Taken to Obtain Rates of Fare High Enough to Cover All Charges

By Britton I. Budd
President Chicago Rapid Transit Company,
Chicago, North Shore & Milwaukee Railroad,
Chicago, South Shore & South Bend Railroad and
Chicago, Aurora & Elgin Railroad

RAPID development of the bus—or, as we prefer to have it known, the motor coach—in the urban and interurban transportation fields has given railway operators a new problem. That problem is to find the best and most economical use to which the motor coach can be put, then to fit it into its proper place in our transportation system. It is the business of transportation companies to supply the public with the character of service it demands. If the public prefers to ride on rubber tires at increased cost, the transportation company must supply that service, even though it may not be the most economical.

The country must look to the existing transportation companies, steam and electric railway operators, to work out the solution of the problems presented. They are the men who by training and experience are qualified to perform this service. That rapid strides are being made in the direction of co-ordination of facilities is seen in the manner in which railway companies, steam and electric, have adopted the motor coach. A survey made by the National Automobile Chamber of Commerce shows that some twenty steam railroads are operating motor coaches as a part of their regular passenger service at the end of 1925 and that eighteen others are now considering the installation of similar service. The same survey shows that 51 steam railroads in the United States and Canada are using motor trucks to supplement their freight service.

The adoption of the motor coach by the electric railways of the country is much more marked. In 1920 only sixteen electric railway companies used motor coaches as a part of their service, while at the end of 1925 there were 280 companies using them. This great increase has come in the last two years. In January, 1924, only 14 per cent of the electric railway companies of the country were operating motor coaches. In January, 1926, the proportion had risen to 35 per cent. These companies are operating 13,000 miles of motor coach routes. That most of this traffic is new business is seen in the fact that electric railways in the same period carried more passengers than ever before in their history.

This extensive use of the motor coach and the motor truck by the railway companies is only a small phase of the industry. The number of independent motor coach operators has increased until there is a network of routes all over the country. All told, there are said to be 70,000 motor coaches now in operation throughout the country, and estimates have been made that the number will reach 100,000 by the end of 1926.

> IN SUMMING UP the motor coach situation in the urban and interurban field some fairly definite conclusions may be drawn from the experience we have gained. In city service the motor coach has its greatest economic value when operated in conjunction with electric railways. It is a most convenient agent to give transportation service along boulevards and parks and to serve as a feeder to electric lines in territory not otherwise served. In the suburban and interurban fields the motor coach is most successful for comparatively short hauls of 20 miles or under.

While the experience of the last few years has demonstrated the usefulness of the motor coach as a transportation agent, it has shown as clearly that it has certain definite limitations. The experience in some instances has been a costly one to the public and to private investors. The public suffered because of inadequate service and the independent motor coach operator lost all or part of his investment. In the urban field it has been shown by the experience of Akron and Des Moines, to mention only two of the number of cities which tried the experiment, that the motor coach is not suited for mass transportation. It cannot substitute for the electric railway. In the interurban field the experience of Indiana is a strong argument for co-ordination of the motor coach with the electric railway.

Comparison of the relative speeds and carrying capacity of the motor coach, the street car and the rapid transit line—elevated or subway—under heavy traffic conditions, tends to place each agency in its proper

*Abstract of an address delivered before the American Society of Civil Engineers, Kansas City, Mo., April 14, 1926.

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place in urban transportation. Under average conditions in the large city during the hours of heaviest travel, the speed of the motor coach is from 8 to 9 m.p.h., and the utmost capacity of double-deck buses under the most favorable conditions in a one-way movement is from 5,000 to 6,000 passengers per hour. The average speed of the surface electric car is from 9 to 11 m.p.h. and its carrying capacity from 14,000 to 16,000 passengers. The rapid transit lines, subway or elevated, operating trains instead of single cars, have an average speed of from 14 to 15 m.p.h. in local service and from 18 to 25 miles in express service. The maximum capacity is from 35,000 to 50,000 passengers an hour.

Certain definite conclusions may be drawn from the Indiana experience. It proves that competition between two transportation systems serving the same communities prevents either system from giving the public the best service. It proves that rates of fare that do not provide a reasonable rate of return on the capital investment lead to bankruptcy.

Type of Service Should Determine Fare

Many motor coach operators made the mistake of establishing rates of fare on a competitive basis with electric railways. Motor coach service costs more to produce than electric railway service and it probably always will. But the public demands this special service and has shown its willingness to pay a higher rate of fare. This is seen in the patronage given the motor coach in New York, Chicago, St. Louis and other large cities where higher fares are charged than on the electric railways.

Although no general rule can be laid down to apply to every situation, either with respect to motor coach operation or the rate of fare to be charged, experience indicates that in city service the rate necessary to maintain motor coach service should be approximately twice that paid on electric railways. In interurban service the rate should be from one-third to one-half more than the railroad rate. The future of motor coach industry depends on its being made self-supporting.

California was among the first of the states to adopt the motor coach on an extensive scale. At first the industry was entirely unregulated, but afterward the motor bus was brought under the regulation of the state railroad commission, which prescribes the system of keeping accounts. An incomplete report issued by the California Railroad Commission covering motor coach operation in that state for the year 1924 brings up the question whether the rate structure is sound.

An analysis of the report made by the chief statistician of the American Electric Railway Association shows that while the California motor bus operators carried 1.5 per cent more passengers in 1924 than they did in 1923 and their total revenues showed an increase of 8 per cent, their net revenue from operations showed a decrease of 7.6 per cent. Operating expenses, exclusive of taxes, increased 10 per cent over the previous year. Taxes were increased 165 per cent during the year and when they are deducted the net income showed a decrease amounting to 42.5 per cent.

The California motor vehicle operators have had more experience than those of any other state. Nearly all of them operate independently of electric railways. If, as the report shows, they are finding it necessary to increase their operating ratio in spite of an increase in business, it indicates that the rate structure is not on a sound economic basis. Electric railway companies which have gone into the motor coach business have generally adapted a rate structure from their railway practice. Experience so far tends to show that railway rates applied to motor coach transportation will not cover the cost of operation.

Proper Maintenance Facilities Needed

With greater experience no doubt the depreciation costs on the motor coach will be materially reduced. Not enough attention has been paid to this phase of operation. If motor coach operation is to be made successful, more attention must be given to garaging facilities and the use of proper equipment for maintenance. Careful studies must be made of tire costs and gas consumption.

City motor coach operation and interurban or intercity operation are separate and distinct propositions. Motor coaches engaged in long-haul operation must be attractive in type and comfortable. Where they are in constant service on regular routes, it may not be necessary that they should be quite as luxurious in furnishings as the types used for special tours, but they must be greatly superior to the ordinary type used in city service.

In interurban and intercity service motor coach schedules must be arranged with great care. They must provide for convenient rest stops and public comfort facilities. These conveniences must be counted in the capital investment and in the cost of operation and maintenance, things which many irresponsible independent operators did not consider.

Bus Placed in Transportation System

In summing up the motor coach situation in the urban and interurban field some fairly definite conclusions may be drawn from the experience we have gained. In city service the motor coach has its greatest economic value when operated in conjunction with electric railways. It is a most convenient agent to give transportation service along boulevards and parks and to serve as a feeder to electric lines in territory not otherwise served. In the suburban and interurban fields the motor coach is most successful for comparatively short hauls of 20 miles or under. In long-haul traffic it is not as useful nor as economical an agent as the high-speed electric railroad and should not be operated in territory served by rail. As an auxiliary to the railroad the motor coach has its greatest usefulness in the interurban field, as it can be used to serve territory contiguous to the railroad for a distance of 25 miles or more. The cost of operating motor coach service is greater than the cost of supplying rail service, and that is always likely to be so. Railway operators with their special training and experience are the men best qualified to operate motor coaches and co-ordinate them with the railways.

It is apparent that in the near future, under a properly co-ordinated transportation system, the motor coach business will simmer down to a sound economic basis. Where it will be found economical to operate motor coaches they will be run, and where it is found that the public will be better and more economically served by rail lines, the latter will carry the traffic.

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Complete Service Includes Buses*

This Valuable Agency in Local Transportation Should Be Used Properly—It Cannot Be a Substitute for the Electric Railway but Has a Place as an Ally

By Fred G. Buffe
General Manager Kansas City Railways, Kansas City, Mo.

IT IS indicative of a better era in our business to find deliberative bodies such as this, composed of thinking men actively engaged in constructive work in their communities, seriously studying the transportation needs of city, state and nation, and by so doing helping those in the business to solve their problems. The bus has been and still is a problem. To the unthinking this may not seem to be a fact. It is easy to say, "We like this new method of riding—the smell of gasoline and a ride on rubber—and if the street railways, the interurbans and the railroads won't furnish such rides, three cheers for the fellow who will." Such was the attitude that existed when competing street railways were built; when competing railroads were invited; when gas and electric franchises were had for the asking, on the theory that competition is the life of trade, and the more the merrier. It took many years of loss and inefficiency before this mistake was generally recognized and before the public accepted *in toto* the theory that certain services, chief of which is transportation, are natural monopolies, and that regulation and not competition is the proper check against abuse. So therefore the bus must be considered not alone as a vehicle capable of carrying people, but in its relation to the transportation situation as a whole, and in the last analysis the problem and its proper solution becomes that of the public.

There is a danger in magnifying the importance of the motor bus and giving it a disproportionate place in transportation. This is natural with a new development, especially one which has enjoyed the advertising and propaganda that have been given to the bus. We are prone to like new toys.

The bus is a valuable agency in urban transportation when its installation can be made carefully and properly, with due regard to other facilities and as part of co-ordinated transportation methods. If, because of too much propaganda or threatened competition, or without due regard to its effect on transportation, it is used improperly, it will in the end work a real public harm where there is an apparent public gain. It is a valuable agency because of its flexibility. It can be used anywhere. Routes can be changed, detours made, delays avoided. It requires a lower investment per seat furnished. It affords an easy and less costly method of making extensions, of serving undeveloped territory, of instituting crosstown lines. It readily lends itself to park and boulevard services that have grown away from car lines. It fills a gap between the street car and the taxicab, and gives the street railway operator a vehicle that appeals to his former patrons who have deserted his service for the private automobile.

THE BUS is not, and as we now see it can never be, a substitute for the electric railway in moving large numbers of persons during the rush hours. The street railway is here to stay, and its usefulness will increase as the vehicle for mass transportation at the lowest possible fare. * * * The street car is the backbone of urban transportation, the great servant of the masses, the foundation on which rests the superstructure of real estate and business prosperity, furnishing the maximum of service for the minimum fare. The bus is primarily a seat-for-every-passenger vehicle, offering a preferential service at a higher fare.

Bus Is Not a Substitute

The bus is not, and as we now see it can never be, a substitute for the electric railway in moving large numbers of persons during the rush hours. The street railway is here to stay, and its usefulness will increase as the vehicle for mass transportation at the lowest possible fare. The street car is more reliable; its rides can be furnished at less cost; it takes up less pavement space per passenger moved; it moves on a fixed track and congests traffic the least, considering the number carried. The street car is the backbone of urban transportation, the great servant of the masses, the foundation on which rests the superstructure of real estate and business prosperity, furnishing the maximum of service for the minimum fare. The bus is primarily a seat-for-every-passenger vehicle, offering a preferential service at a higher fare.

As confirmation of this statement, it is only necessary to call to your attention the electric railway activity in the country today. There is a great awakening

*Abstract of discussion before the American Society of Civil Engineers, Kansas City, Mo., April 14, 1926.

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in every city. New equipment is being bought, tracks are being rebuilt, higher standards of service are being maintained, and, most important, street railway securities are no longer a drug in financial centers. These things are not by chance. Bankers of long experience would not advise or permit such programs if these railway properties overnight were going out of business.

The competing bus is a pirate by its very nature. Instead of rendering a public service as it seems, it is in reality working a great public injury. It is a backward step in urban transportation, and at some future date the bill must be paid. It will be paid in lack of capital for improvements, in impaired service—often in forced consolidation by which the promoters collect their profit and the street railway as a public agent pays the loss, which in turn becomes the public's. Such competition exists only because it is permitted to serve preferred territory, with great traffic density and a high load factor. It does not assume the burden and the obligation of city-wide service, of undeveloped lines and districts, but leaves these to the street railway, while it takes the business the railway must have to support its service obligations.

With its system of flat fares and universal transfers, transportation is properly a municipal problem, and certain sections can be served only because the better lines support the entire structure. In many cities such unwise competition has been most unfair, not only in being given the advantage of short hauls and profitable territory, but in being relieved of paving, street cleaning and tax burdens with which its older competitor has been laden.

In this connection it is interesting to note that in London, where 5,384 buses in 1924 carried 1,485,000,000, the necessity of public action to protect tramway service and to relieve street congestion is recognized. The ELECTRIC RAILWAY JOURNAL in its issue of April 10 states:

> Following prolonged study of the traffic and transportation situation in London, the Ministry of Transport has ordered drastic cuts in the daily number of bus trips on one of the great thoroughfares serving the western suburbs. This action is intended to be the forerunner of similar orders applicable to other important routes. The object is twofold: to lessen street congestion and to protect the tramways from ruinous bus competition.

The proper place for the bus is as an integral part of a co-ordinated transportation plan. Co-ordinated transportation contemplates a complete service, using both bus and street car, not making one subordinate to the other but fitting each vehicle to its proper field to avoid duplication and to render a more efficient and desirable public service.

The bus when used as a feeder, as a server of undeveloped territories, as a crosstown facility and on lines where track must be rebuilt and where there is no rush-hour problem, plainly meets a real need. It can also be used as a main or through line carrier, serving districts heavily built up away from car lines and along boulevards and parks where car lines would not be permitted.

DON'T USE THE BUS HALF-HEARTEDLY

I do not believe the bus should be used half-heartedly and confined to the outskirts. The public desires bus transportation, and as transportation agencies we must meet this public desire. The downtown bus can be used to advantage. It offers a different service, makes an appeal to a certain class of riders who are willing to pay a higher fare on a seat for every passenger basis.

There is also opportunity in many cities for a limited stop, express service from distant residential districts at a 25-cent fare.

Just a word on our local situation. Kansas City operates 69 buses on four downtown routes, one express route, one crosstown route and four feeder routes, a total of 44 route-miles. The fare is 10 cents without transfer except on feeder and crostown routes, where transfers are given from bus to street car and from street car to bus on payment of 3 cents differential. The express fare is 25 cents. Two hundred thousand bus-miles a month are run and 540,000 passengers carried.

This bus installation is a good example of co-ordination and of a proper public attitude. Kansas City desired buses. There was an extended investigation by merchants, associations and others, and the general public opinion was that such service should be available here. A franchise was submitted by promoters financially able to carry out their commitments. Had this competition been successful in Kansas City it would have wrecked the Kansas City Railways and postponed the lifting of the receivership indefinitely. Incidentally, it may be said that jitney competition in 1918 and 1919, taking $3,000 a day in revenue, was a large contributing factor to the receivership.

The public, the press and city authorities took the position that although bus service was wanted, the first opportunity should be given to the railway company, and that competition be not permitted. As a result, after careful analysis and planning, the Kansas City Railways has co-ordinated bus transportation so as to furnish a maximum of service and not compete directly with existing facilities.

The bus, properly developed and co-ordinated, has a future as a transportation agency. It will be further perfected and refined. New uses for it will be found. It will develop its own clientele. It will do its part to solve the traffic and parking problems. It offers to us new opportunities to serve as well as new problems to solve, and its proper development will in the end mean a distinct public gain.

THE electric railway industry is finding the place of the bus in local transportation. The preceding remarks by Britton I. Budd of Chicago and the statements of Mr. Buffe indicate the rapid progress that is being made in co-ordinating bus and electric railway service.

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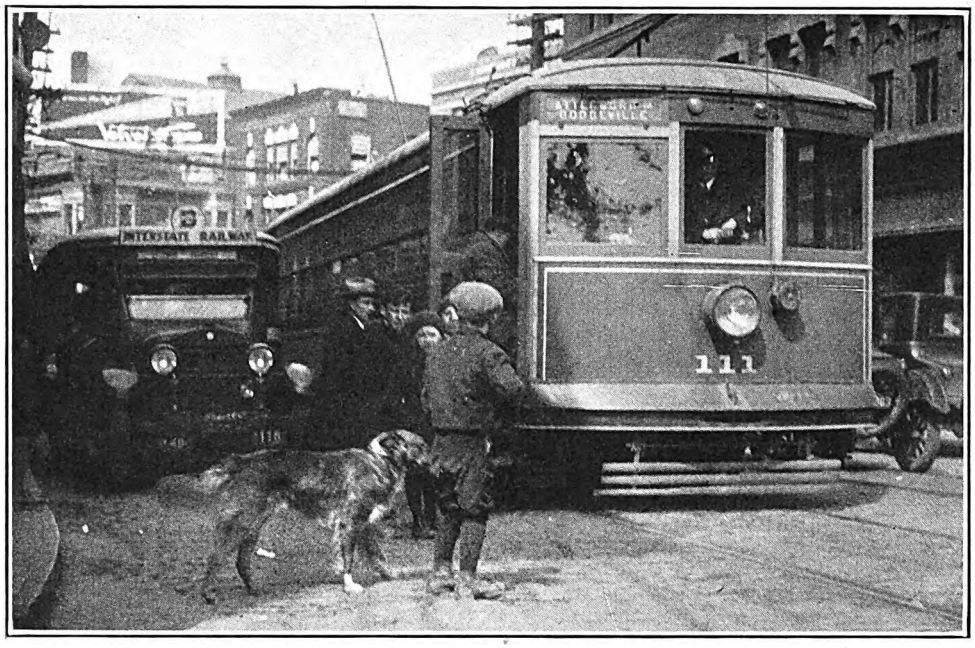

Pawtucket Terminus of the Interstate Street Railway Line from Attleboro. Cars and Buses of These Types Have Cut Operating Cost and Built Up Traffic

Modern Methods of Operation Prove Profitable

Revenues Have Been Increased and Operating Expenses Substantially Reduced Since the Interstate Street Railway Was Re-equipped with New Rolling Stock and Other Improvements Made—About $18,000 Has Been Saved in Six Months in Maintenance of Equipment and $10,000 in Power Cost—Accident Claims Have Been Practically Eliminated

WHEN the new management of the Interstate Street Railway, Attleboro, Mass., decided to re-equip the property with modern rolling stock it was expected that this move would result in a material reduction in operating expenses. Details concerning the receivership of the railway, its purchase by Hemphill & Wells, and its subsequent rehabilitation were given in the issue of ELECTRIC RAILWAY JOURNAL for Aug. 29, 1925. Figures now available for seven months of operation show that these expectations were fully justified. A saving of nearly one-third has been made in the cost of operation and at the same time the gross earnings have shown a substantial increase.

In June, 1925, when Hemphill & Wells acquired the property there was a deficit of $1,981 for the month. The new cars were not in full use until the middle of July, but at the end of that month there was nevertheless a balance of $22 after the payment of all interest charges and taxes. August, the first full month of operation of the new equipment, showed a balance of $1,609. From then until the end of the year each month showed a larger balance than the preceding, reaching a maximum balance of $5,528 in December. A detailed statement of gross earnings, operating expenses, taxes and interest charges by months is given in an accompanying table.

Chief among the causes for this increase in the net earnings has been a substantial reduction in operating expense. The cost of equipment maintenance has been reduced about 5½ cents per car-mile since the new cars have been in operation. During a period of six months this has resulted in a saving of approximately $18,000. Transportation and traffic expense has been reduced 4 cents per car-mile, due largely to the operation of cars by one man instead of two. Energy consumption cost has been reduced slightly more than 3 cents per car-mile, resulting in a total saving of nearly $10,000. There has also been a slight reduction in the way and structures expense per car-mile, but this has been more than counterbalanced by an increase in the general and miscellaneous expense.

COMPARISON OF OPERATING EXPENSES CENTS PER CAR-MILE

	Three Months Prior to Reorganization	Seven Months After Reorganization
Way and structures	4.09	3.11
Equipment	8.14	2.47
Power	8.92	5.71
Transportation and traffic	13.08	9.06
General and miscellaneous	3.52	5.39
Total	37.75	25.74

Comparing the operating costs per car-mile for three months prior to the reorganization of the company with the figures for the first seven months after reorganization, there is found to have been a saving of about 12 cents per car-mile. The former average was 37.75

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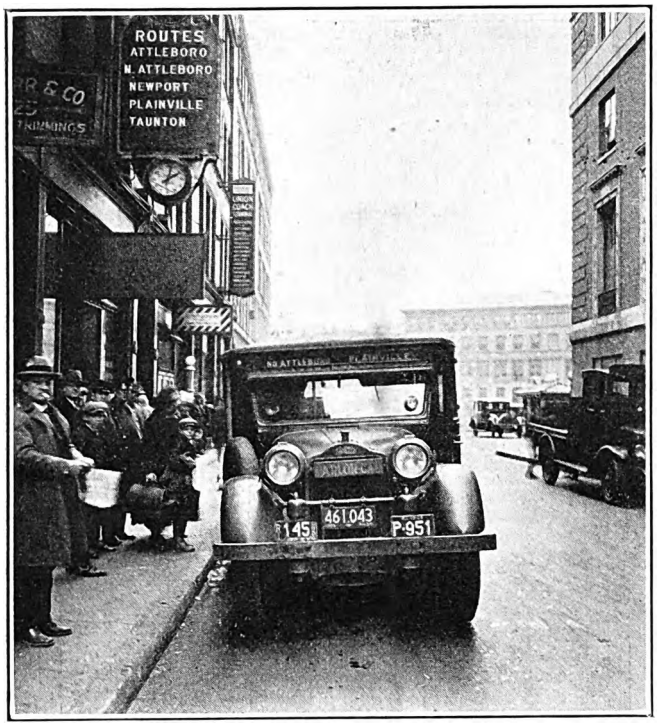
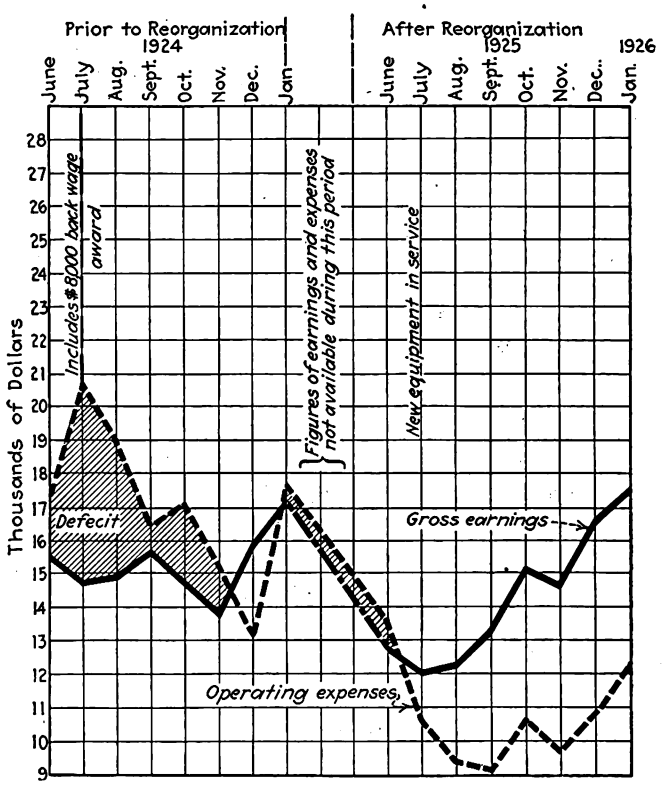


Bus Owned by the New England Transportation Company and Operated by the Interstate Street Railway Standing Near the Providence Waiting Room Jointly Operated by Interstate Street Railway and United Electric Railways

cents. This has been reduced to 25.74 cents. Detailed figures for the various accounts are given in the table on page 719.

Another influential factor in the reduction in operating costs has been the practical elimination of accidents. Between May 29, 1925, and Jan. 31, 1926, there were a total of 27 accidents connected with the operation of the Interstate Street Railway and its affiliated company, the Attleboro Branch Railroad. During this time 225,421 car-miles were run as well as 129,157 bus-miles, making a total mileage for the system of 354,578.

Only four of the 27 accidents which occurred required the expenditure of money for settlement. In one case a bus scraped the mudguard of a private automobile, and in two cases cars struck automobiles causing slight damage. One woman was knocked down by a car and taken to a doctor to be treated for minor injuries. Altogether these accidents cost the company $52.50. During the same period three minor accidents occurred to employees in the company shops. These were settled



Deficit Between Gross Earnings and Operating Expenses of the Interstate Street Railway Has Been Converted into a Substantial Balance Since Reorganization and the Placing of New Equipment in Service

RECORD OF ACCIDENTS MAY 29, 1925, TO JAN. 31, 1926

Interstate Street Railway

Accident No.	Nature of Accident	Damage Done	Settled For
1	Car left rail hitting pole	Broke car step and lead	
2	Car left rail	None	
3	Auto coasted down hill hitting street car	Bent mudguard	
4	Truck backed on to track hitting car	None	
5	Bus struck auto	Scraped mudguard	5.00
6	Car struck machine	Bent rear mudguard	
7	Car struck machine	Bent front mudguard	35.00
8	Bus hit machine	Burst spare tire and bent rim	
9	Car hit machine	Bent front mudguard	
10	Car hit truck	Corner of car broken. No damage to truck	
11	Car hit truck	Broke front wheel on truck. Broke fender gate on car	
12	Car hit truck	Bent corner post of car. No damage to truck	
13	Car hit truck	Broke window in car	
14	Car hit ladder on truck	Bent frame-holding ladder	
15	Truck hit bus	Slight body damage	
16	Car hit Ford auto	Bent mudguard and broke wishbone	
17	Auto hit bus	No damage to either	
18	Woman hit by auto after leaving car	Only slightly hurt	
19	Car left rails hitting pole	Windows and corner of car broken	
20	Car hit rear end of auto	Bent gas tank on auto	
21	Car hit rear end of auto	Bent mudguard	
22	Door of bus open, striking boy on bicycle	No injury done	
23	Passenger struck by auto, after leaving car	Not known	
24	Car hit auto	Knocked tire off and bent mudguard	
25	Auto skidded into car	Broke radiator	
1a	Car hit auto	Bent mudguard	
26	Auto hit by car	Bent mudguard	4.50
	Total car and bus accidents—Interstate		$44.50

Miscellaneous Injuries—Interstate

July 13, 1925	D. J. Buckley, master mechanic	Medical attention on account of injury to leg	31.00
October, 1925	Elmer Gammon, bus mechanic	Medical attention on account of injury to side	5.00
January, 1926	Elmer Gammon, bus mechanic	Medical attention on account of injury to eye	7.00
	Total injuries to employees		$43.00

Attleboro Branch Railroad

1	Woman struck by car	Only slightly injured. Taken to doctor for treatment	8.00
	Total injuries and damage payments 5-1-25 to 1-31-26 (Interstate and Branch)		$95.50

Note: There were no outstanding claims on Jan. 31, 1926.

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for $43. Altogether the total payments for injuries and damages during seven months amounted to $95.50. Details of the accident records are given in an accompanying table.

The good accident record has been made largely as a result of the whole-hearted co-operation of the employees. All of them have been in the service of the railway for a long time and have come to realize that their own interests are closely bound up with the interests of the company. On its part the management has done everything possible to make the men contented. Last Christmas each man received a gift of an insurance policy arranged for by the company under the group insurance plan.

As a reward for the excellent work done during the severe snowstorm in the early part of the present year, on Feb. 25 each man received along with his regular pay envelope a second envelope containing a $10 bonus. Accompanying this was a card containing the message:

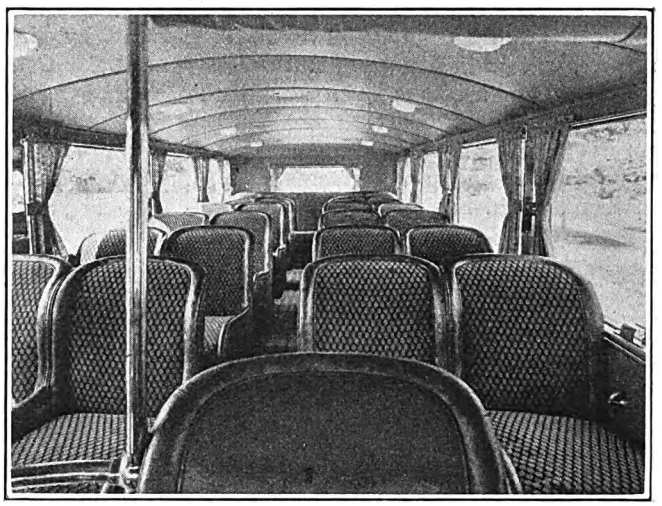
To My Friend and Co-worker: The inclosed is offered to you as a means of expressing our thanks for the splendid spirit shown by you and the entire organization during the very trying period of the recent snowstorm.

The energy, perseverance and co-operation of all the fine people connected with this organization enabled us to resume complete service in record time.

GEORGE W. WELLS, General Manager.

The reward was highly appreciated by the men and they unanimously adopted a motion to give public thanks to their employers. In the North Attleboro *Chronicle* for the following day appeared a notice reading: "The employees of the Interstate company desire to express their sincere thanks to the company and to Manager George W. Wells for the bonuses received."

In addition to the reduction which has been made in operating expense, there has been a substantial increase in the gross earnings. Following the acquisition of the property by Hemphill & Wells these reached a minimum slightly under $12,000 in July, the month during which new equipment was put in service. Immediately after that the earnings began to increase, being $12,247 in August, $13,297 in September, $15,096 in October, $14,719 in November, $16,591 in December and $17,496 in January, 1926.



Attractive Interior Appearance of Bus Operated by Interstate Railway. Superiority of Equipment and Service Has Attracted Traffic from Competitors

Increase in revenue has resulted entirely from the increase in traffic as the rate of fare has remained constant for several years past. Moreover, the gain has been brought about with practically no increase in the number of car-miles and bus-miles operated. These figures are shown by months, together with the comparative earnings and expenses, in an accompanying table.

Operation of modern cars and buses is thought by the management to be the principal reason for the increase in traffic. Connecting as it does the cities of Attleboro and North Attleboro in Massachusetts with Pawtucket and Providence in Rhode Island, the Interstate Street Railway has been faced with serious interstate bus competition. Superiority of equipment and service has been the drawing card by which riding has been increased in the face of this competition.

Joint service from North Attleboro to Providence has been operated by the Interstate Street Railway and the New England Transportation Company, a subsidiary of the New York, New Haven & Hartford Railroad since Sept. 27, 1925. Under this arrangement 25-pas-

COMPARATIVE EARNINGS JUNE, 1924, TO JANUARY, 1926

	June		July		August		September	
	1924	1925	1924	1925	1924	1925	1924	1925
Gross earnings	$15,449	$12,702	$14,736	$11,975	$14,924	$12,247	$15,658	$13,297
Operating expenses. (a)	17,331	13,496	28,715 (b)	10,596	19,022	9,370	16,286	9,093
Net earnings	*$1,882	*$794	*$13,979	$1,379	*$4,098	$2,877	*$628	$4,204
Taxes	841	886	842	850	841	849	781	850
Balance	*$2,723	*$1,680	*$14,821	$529	*$4,939	$2,028	*$1,409	$3,354
Interest charges, etc.	619	301	619	507	124	419	....	380
Balance	*$3,342	*$1,981	*$15,440	$22	*$5,063	$1,609	*$1,409	$2,974
Car-miles		27,700		29,295		28,689		27,765
Bus-miles		15,703		13,414		16,115		15,738
Total		43,400		42,709		44,804		43,503

	October		November		December		January	
	1924	1925	1924	1925	1924	1925	1925	1926
Gross earnings	$14,851	$15,096	$13,831	$14,719	$15,778	$16,591	$17,101	$17,496
Operating expenses (a)	17,032	10,689	15,227	9,775	13,115	10,905	17,686	12,303
Net earnings	*$2,181	$4,407	*$1,396	$4,944	$2,663	$5,686	*$585	$5,193
Taxes	918	850	*1,602 (c)	883	841	*212 (c)	850	881
Balance	*$3,099	$3,557	$206	$4,061	$1,822	$5,898	*$1,435	$4,312
Interest charges, etc	.....	386	.....	374	35	370	.....	365
Balance	*$3,099	$3,171	$206	$3,687	$1,787	$5,528	*$1,435	$3,947
Car-miles		28,831		27,574		27,767		27,800
us-miles		16,872		16,131		17,587		17,600
Total		45,703		43,705		45,354		45,400

(a) Includes depreciation. (b) Includes $8,000 back wage award by court. (c) Includes rebate on taxes. * Deficit.

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senger de luxe White buses owned by the New England Transportation Company have been operated by the railway, as told in ELECTRIC RAILWAY JOURNAL for Oct. 3, 1925. The buses are much superior to those operated by independent competitors and the schedule has been more regular. As soon as additional bus equipment is available it is planned to commence a similar operation between Providence and Attleboro.

Few Chicago Department Store Customers Come by Automobile

FOUR large Chicago department stores recently made a special check to discover, in some measure, the value of parking space in the Loop district in helping customers reach their stores. Checkers stood near the store entrances and picked out, from those entering, customers whom they thought from appearances would be likely to have arrived by automobile. They asked each one so selected what method of transportation was used in reaching the stores. Following is a tabulation of the answers as recorded:

Total number of persons interviewed	15,229
Arriving by automobile, chauffeur-driven	964
Arriving by automobile, self-driven	716

Of these two groups the number parking while the owners were shopping were located as follows:

In street or alley in Loop	151
Outside the Loop on streets	301
In garages	146
In public parking space in Grant Park	223

When the store managements discovered that such a negligible proportion of specially selected groups were using parking space they fully realized that of their total customers this number was too small a total to be seriously considered.

Lost Property Curiosities in London

FIGURES compiled by the London Underground Railway Companies regarding property lost on their lines during 1925 show that 41,078 articles found their way to the lost property office. Inquiries received regarding lost property totaled 51,000, while personal calls averaged 150 a day. Of the articles found, 35 per cent were restored to their owners, 40 per cent were lost by men and 60 per cent by women. About 1,000 articles a month are lost on the District Railway and about 1,500 on the tubes. Gloves are easily first, though they are usually lost one at a time. Umbrellas and walking sticks come next, closely followed by hand bags, vanity cases and the like.

An atmosphere of tragedy surrounds the loss of such articles as a lady's brand new hat, a set of false teeth, a bottle of champagne, oil shares, golf clubs, a shirt, lingerie, artificial limbs, human bones and skulls, and a pair of crutches, which latter articles were lost and reclaimed by their owner on three separate occasions.

Other amusing finds returned include a cat. One of these animals is still in residence at the Victoria lost property office earning its keep as a mouser. Another cat was left in a Central London Railway car a few months ago. This one, however, was in a bottle and possessed eight legs and four tails. It was eventually claimed by a hospital student. A pet performing rat was caught on the City & South London Railway recently and was subsequently restored to its owner. Live mice, of the white variety, were left in a car once by a passenger.

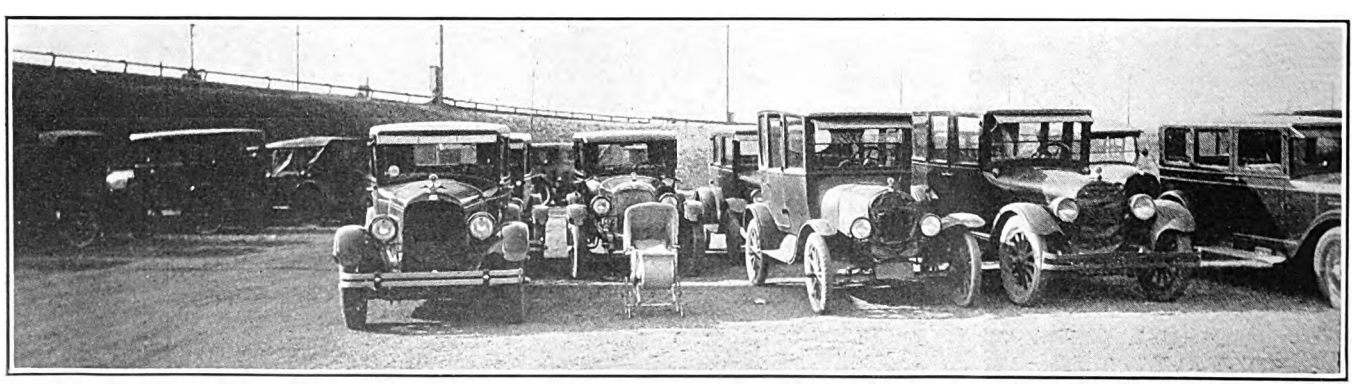
P.R.T. Parking Plan Being Extended

RECENTLY the Philadelphia Rapid Transit Company has opened the third parking area for private automobiles. To one of these areas a prospective passenger drives his car, pays the parking fee and receives two car tickets, which entitle him to ride into the city and back to the parking area.

Sign Displayed in P.R.T. Street Cars Calling Attention to Parking-Riding Plan

Last fall two of these areas were opened. One is at 69th and Market Streets, capable of accommodating 250 cars. The other is at Bridge Street, Frankford, which is at the opposite end of the elevated-subway line and is capable of accommodating 500 cars. These two areas being in outlying territories a charge of only 25 cents is necessary. Of this amount, 15 cents is absorbed in the transportation furnished by the P.R.T. and 10 cents for the use of the parking area. Recently a third parking area has been opened, at 31st and Market Streets, capable of accommodating 100 cars. On account of the higher price of real estate, the charge at this point is 35 cents, including two car tickets.

It is planned to extend these parking areas in a ring around the central business district of Philadelphia, in



Parking Area in Operation by P.R.T. at Bridge Street, Frankford

Frequently a mother brings her child to the grounds in a perambulator, pays the regular parking fee of 25 cents, taking the child into town on the Frankford elevated. The perambulator is allotted a regular space by the attendant.

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prescribed by the Interstate Commerce Commission and adopted as standard by the American Electric Railway Association. This classification, however, is too general to provide information to the department heads by which they can determine which particular piece of apparatus or which particular class of work is causing excessive expense. A more detailed study of costs is necessary to determine these things.

It is difficult to determine to just what extent this cost accounting should be carried or to find just how much into detail this should be handled. There is, however, no question in my mind but that excessive expenditures may be located by a more detailed subdivision of the standard classifications. Once it is determined what is causing excessive expenditures, there are usually several corrective measures available, and it is from detailed cost analysis that the minimum expense in the equipment and other maintenance departments may be secured.

WILLIAM W. HOLDEN,
Manager Traction Department.

Street Railways Not Giving Way to Buses in Berlin

BERLIN STREET RAILWAY SYSTEM, INC.

BERLIN, GERMANY, April 10, 1926.

To the Editor:

There has been a great deal of talk in Berlin, as well as in London and in many of the large cities of your country, that the street railway lines are going to be replaced by omnibuses. This idea, which is being propagated to a considerable extent by the daily papers, is entirely incorrect, at least so far as Berlin is concerned. Bus traffic is much smaller here than street railway traffic, and street congestion is increased much more by buses than by street cars.

The charge is sometimes made here that the constantly growing number of vehicles on the principal streets in Berlin are being delayed in their movement by the existence of the street railways and that street traffic problems would largely disappear if the street car should give way to the omnibus. The fact is that the street traffic problems here, as in New York and other large cities in America, have been brought about solely through the undue increase of motor vehicles, and it is perfectly safe to say that these difficulties would not only not be decreased by the removal of the street railways and the substitution for them of omnibus lines, but they would be still more serious.

One reason for this is that a modern street car will carry many more passengers than a bus, and if the 3,000 street cars in Berlin were abolished it would take 4,000 buses to carry the same number of people. Moreover, the present street car fare in Berlin, which is 15 pfennigs (3¾ cents) and includes one transfer, would have to be more than doubled if all of the car lines should be changed over to bus lines. Both of these reasons are sufficient to keep the city of Berlin from committing such a folly as changing from cars to buses.

It is generally realized in this city that the traffic congestion on the principal streets can be reduced only by the building of more underground railways. In consequence, steps were taken after the end of the war to consider such extensions, but none could be built because of the dearth of capital. This has meant that the street railways have had to carry the bulk of the load. Moreover, the cost of construction is double that which prevailed before the war so that the rate of

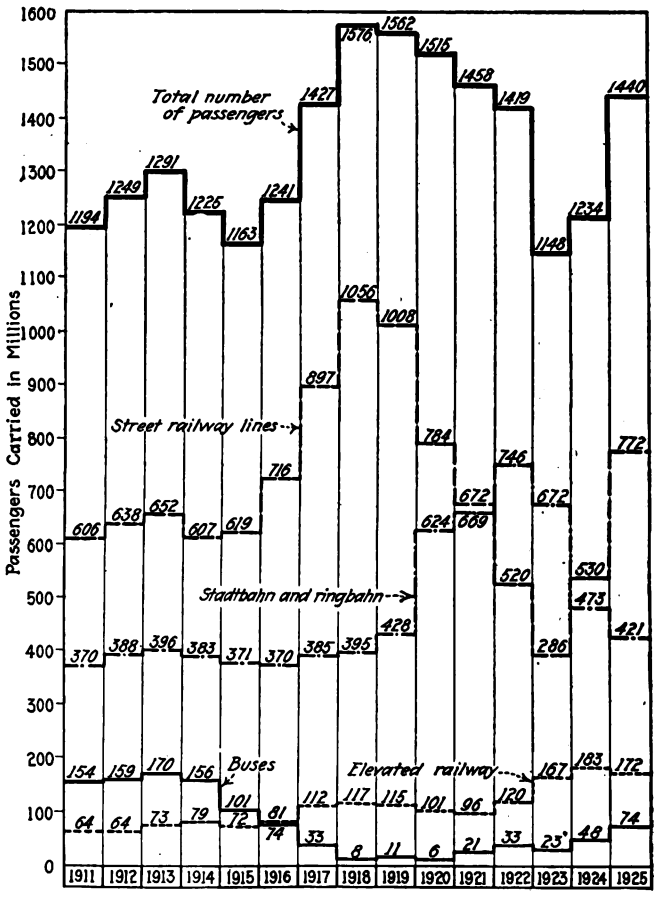

Chart Showing Passengers Carried in Berlin by Different Systems During the Last Fifteen Years

fare on all new underground lines would have to be much higher than was possible formerly. The result of all these conditions is that the street railway, which operates cheaply and in the future will be capable of operating more cheaply than any other means of transit, must form the backbone of Berlin's local transportation, at least for the present.

During the last two years the street railways have enjoyed an increase in traffic experienced by no one of the other transportation agencies of the city. The rolling stock has recently been expanded by the addition of 1,000 new light-weight cars of large carrying capacity. Despite this very considerable increase in number of cars, there are not enough to care for those who wish to ride, so that 300 more cars will shortly be ordered.

During the last two years 203 km. of track has been rebuilt, of which about 46 km. constitutes new construction. At the same time a new large depot has been built, still another is under construction, and the capacities of two other depots are being increased.

The accompanying chart shows that the street railway system in Berlin, both before the war and today, is playing the leading part in local transportation. From this chart, it will be seen that in 1925 the electric railway system carried 54 per cent of all of the local traffic in Berlin, the remainder being divided 29 per cent to the Stadtbahn, 12 per cent to the elevated-underground railway, and 5 per cent to the buses. While the results at the end of the present year may show some slight change in these figures, there is no doubt that the street railway, because of its low fare and innate great value as a traffic agency, will continue to play for some time its preponderating rôle as the main reliance for Berlin local traffic.

WILHELM PFORR,
Direktor.

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Maintenance Notes

Atlanta Has Economy Meter Test Car

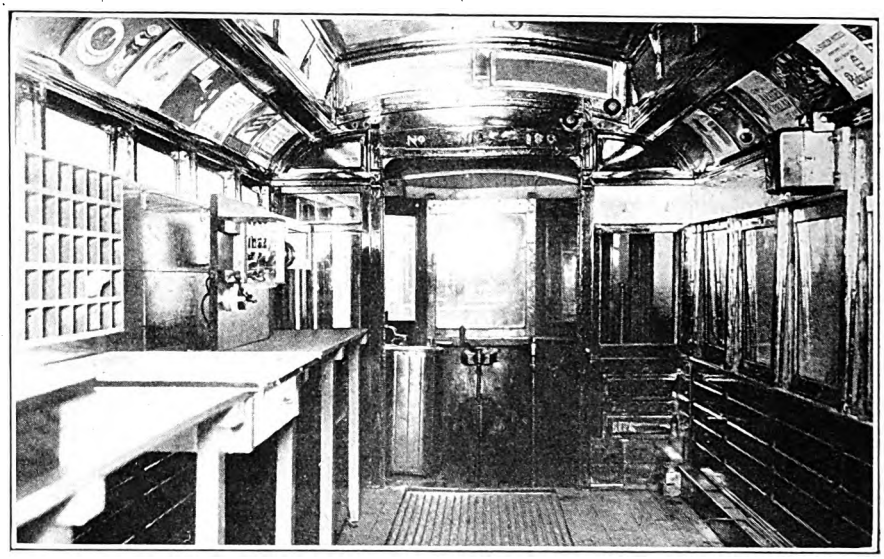
SOME time ago the Georgia Railway & Power Company fitted up an old car especially for the cleaning, repairing and testing of Economy meters. This work is done by one man who had the choice of visiting the different carhouses to care for the meters or having the cars brought individually to one central place for the same purpose. The former plan was selected, and the old car already mentioned is the answer to the problem as to the way by which this work is to be accomplished.

The glass in the side sash on one side of the car was removed and sheet steel inserted to give the car a neat appearance. Otherwise the back paneling above the workbench in the car would be seen from the outside.

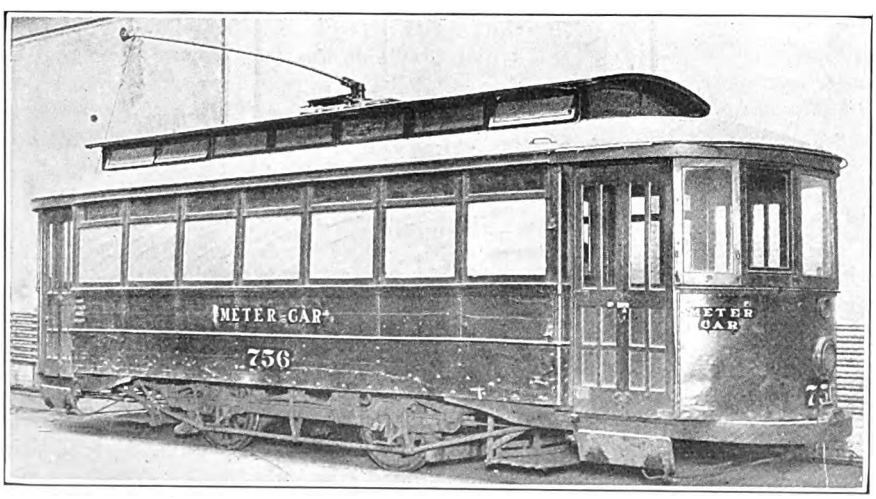
The interior view of the car shows this workbench on the left in the engraving. A rack for extra parts is shown in the left foreground. Directly below the rack is a porcelain table top upon which the meter elements are disassembled. Porcelain is used for the top of the table because it will hold the mercury used in the meter elements and so reduces loss.

The test rack is shown in the engraving to the right of the porcelain table. A master element is mounted permanently on the test rack and is inclosed in a dustproof glass case. The element to be tested is mounted on studs to the left of the master element. A cabinet with glass door is shown to the right of the test rack. After the meter elements are tested, they are put in this cabinet to protect them from dust.

A resistance unit is shown under the table on the floor. This resistance is used to cut down the current to that sufficient for the meters on test. The rack above the windows on the right-hand side of car in the engraving supplies space where meters can be hung before or after being tested.



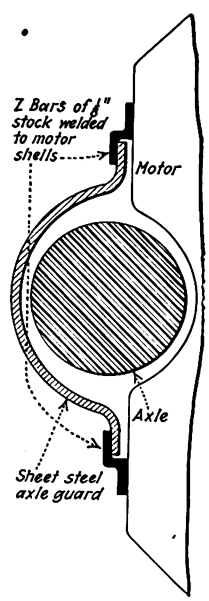
Everything Needed for Meter Cleaning, Testing and Repairing Is on This Car



This Car Is Fitted with Apparatus for Meter Testing and Can Be Run from One Point to Another on the System

Axle Dustguards for Old-Type Motors

MUCH of the wear of axle bearings comes from dust and grit working into them at the ends. Motors of late types either have the axles entirely inclosed or a dustguard is placed over the center portion as a protection. There are many old-type motors, however, without axle dustguard provision. To obtain this advantage for its old-type motors, the Department of Street Railways, Detroit, welds two Z-shaped bars to the motor shell just above and below the axle, and a sheet steel axle guard is sprung into place. When this is once in position it is held firmly by the Z-bars. The accompanying illustration shows the construction. By adding axle guards to the old-type motors life of the bearings has been increased considerably.



Construction Used in Detroit for Axle Guards on Old-Type Motors

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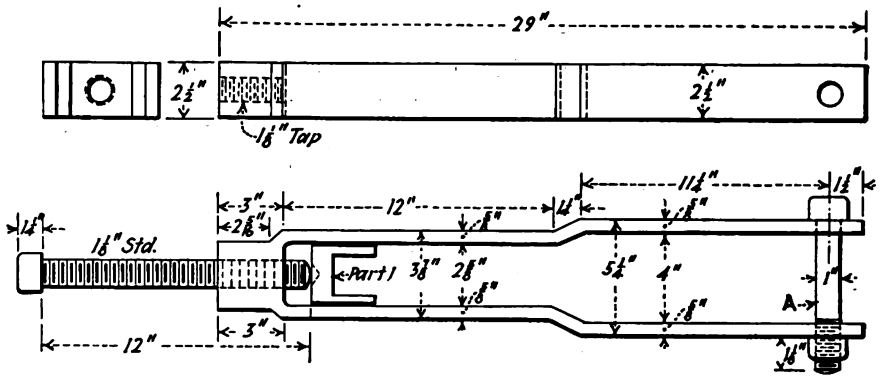
Testing and Greasing Trolleys in One Operation at Milwaukee

When inspecting trolley poles and wheels a spring scale arranged to be fastened to the trolley as shown in the picture is convenient to hold the wheel at a suitable height for lubrication. The picture shows the inspector greasing a wheel with the gage in position on one of the cars of the Milwaukee Electric Railway & Light Company. Just before or just after lubrication he notes the tension and adjusts the springs in the base to normal. The proper spring tension is stenciled on the top on the lower half of the strap—28 lb. for city cars and 35 lb. for interurban.

Trolley Tension Checked on Milwaukee Cars When Lubricated

Installing and Removing Semi-Elliptic Springs

ON BRILL type trucks, which have the graduated spring system similar to that used on the 39-E truck, the truck bolster rests on a spiral spring which in turn is carried on a semi-elliptic spring. The spiral spring is designed to carry the car under light loads, and goes out of action when the spring seat and cap come together. Under heavier loads the semi-elliptic springs provide the spring action. The graduated spring system is used on the 27-E1 trucks operated by the Lehigh Traction Company, Hazleton, Pa., and in order to assist in installing and removing the semi-elliptic springs, James W. Brown, superintendent of shops, has originated the device shown in the accompanying illustration. By use of this device one man can install or remove a semi-elliptic spring in a quick and safe manner. No clamps, bolts or chains are used.



Rigging Used in the Shops of the Lehigh Traction Company for Installing and Removing Semi-Elliptic Springs

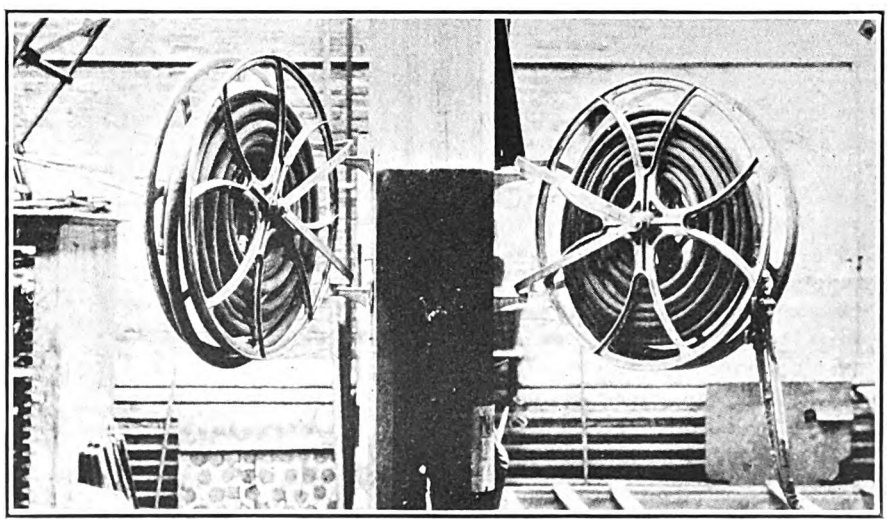
The method of installing a semi-elliptic spring by means of this rigging consists of inserting one end of the semi-elliptic spring in its seat casting in the hanger of the twin-swing link on one end of the truck. With one end of the semi-elliptic spring in the spring seat casting the other end is allowed to rest on the shop floor. The truck bolster is then dropped into place and is held up against the bottom of the truck frame with a jack or crane. The graduated spring seat casting, together with the spring, is then installed on top of the semi-elliptic spring, and the rigging for raising the semi-elliptic spring into place is then dropped over the truck frame. This extends down over the sides of the semi-elliptic spring and the bolt, indicated as *A* in the accompanying drawing, can be easily inserted.

The adjusting screw at the top end of the rigging can then be turned, which raises the semi-elliptic spring into place. With both ends of the semi-elliptic spring in the spring seat castings, the rigging can be slackened off so as to remove the bottom bolt *A* from the rigging and lift off the device.

Reels Protect Shop Hose

FOR burning paint off cars the Grand Rapids Railway, Grand Rapids, Mich., uses a combination gas and air nozzle with a 50 ft. twin hose connection. Each hose is ¾ in. outside diameter and ⅜ in. inside. The two hose for each fixture are vulcanized together to form a single line. For burning off paint the shop air pressure of 60 lb. is used together with city gas.

The railway keeps the hose when not in use on standard fire hose reels. These are 23½ in. outside diameter. Brackets are installed at convenient locations on walls or posts, and the reels can be lifted from one location and be installed in another as desired.



Reels for Gas and Air Hose in the Shops of the Grand Rapids Railway Give a Neat Appearance and Result in Increased Life to the Hose

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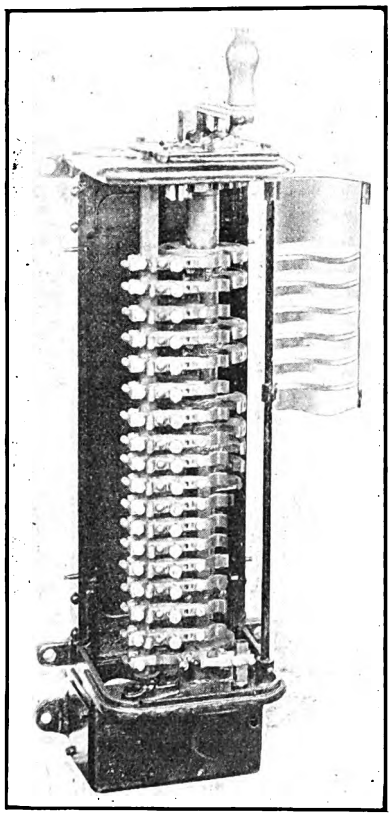
New Equipment Available

New Line of Drum Controllers

SEVERAL distinctive advantages are claimed for the new line of drum controllers recently developed by the General Electric Company. One of the particular features is in



Wall-Type Drum Controller

the mechanical construction, a skeleton type of frame being used. This consists of a cast cap plate and base, to which are hot riveted rectangular steel bars, thus making it unnecessary for the back of the switch to function as a framework for holding the top and bottom sections together. As a result, the switch is accessible from both front and back for the purpose of making adjustments, renewals, etc.

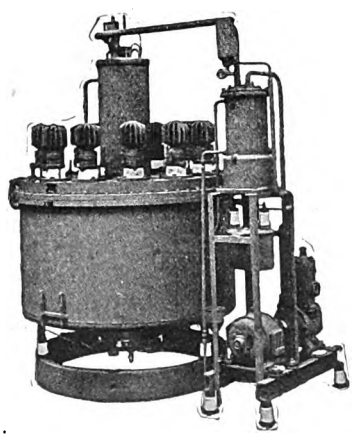
The new controller is designed for crane hoists or machine tool applications, as well as for other general control purposes. In each group several sizes have been provided to cover a wide range of motor ratings, the smaller sizes being suitable for wall mounting, and those for larger motors for floor mounting.

A desirable feature, particularly valuable in crane service, is the interchangeability of operating handle mechanisms. A vertical operating lever or a spring return mechanism may easily be substituted for the horizontal lever with which the switch is equipped by using another dial plate. New-style self-aligning contact fingers are used. The manufacturer states that by standardizing the renewal copper tips for all switches of the same capacity, renewal stocks will be reduced to a minimum. Where cross-arcing is likely to occur, adequate preventive barriers and blowouts have been provided.

Auxiliary contact fingers are provided for control circuits to the line protective switch. The arrangement of these circuits is designed to suit the service requirements of the installation.

Large Mercury Arc Power Rectifiers

FOR current conversion in all capacities and voltages now standard for rotary converters and motor generators, a line of large mercury arc rectifiers of large capacity is being placed on the market by the American Brown Boveri Electric Corporation, Camden, N. J. They may be secured with capacities up to 3,000 kw. at 4,000 volts direct current. An efficiency curve which maintains a high value even at low load factors, characterizes these rectifiers. The absence of rotating parts eliminates the inherent drawbacks of machinery possessing such parts and creates a quick adaptability to sharply varying loads. Rectifiers may be used in parallel with other types of conversion equipment and in such use require no synchronizing.



Large Type of Mercury Arc Power Rectifier

It is claimed that rectifier installations require very little attention and maintenance. A further favorable point results from the absence of hum and vibration in substation equipment. The starting and stopping may be controlled automatically by function of the load, by clock, by remote control or by combinations of the above. Rectifier substations are fully protected against overload and short circuits by time-reset relays. The manufacturer recommends rectifiers particularly for electric railway service where the exacting demands of load extremes are most pronounced.

Taper Pin Reamer

CONSIDERABLE reduction in torque has been effected through the design of a new taper pin reamer just brought out by the Morse Twist Drill & Machine Company, New Bedford, Mass. It is a three-flute left-hand spiral reamer of stronger construction than former types.

This Taper Pin Reamer Shows Reduction in Torque

On comparative tests made recently with the new form of reamer, a right-hand spiral reamer with a like number of flutes and a regular straight flute reamer over a similar time period in machinery steel 1½ in. in thickness the new reamer showed a torque of 5½ in.-lb., the old type fluted reamer 55 in.-lb. and the straight fluted reamer broke at 34 in-lb. The reamers were fed through 2½ in. of penetration. The new reamer showed a gradual increase in torque as the penetration increased; the torque of the right-hand spiral reamer fluctuated widely during the greater part of the test, while the straight reamer fluctuated considerably before breaking.

The smooth operation and comparative economy of power consumption shown by the new reamer is accounted for by the fact that it makes use of the familiar "shearing cut," rather than operating by mere brute force. Reamer No. 683 is of carbon steel, while No. 1,683 is of high-speed tool steel.

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Association News & Discussions

City Traffic and Its Best Servant*

Traffic Congestion Is Intolerable in Large Cities and Is Almost as Bad in Many Small Cities—Suggestions for Relief

By Frank R. Coates
American Electric Railway Association

SINCE time immemorial it has been declared that death and taxes were the only certain things in this world. Now, however, with the rapidly growing number of vehicles in our streets, one more thing becomes a certainty. It is that intolerable traffic congestion is going to ensue in all our cities unless remedial steps are taken immediately. Traffic congestion has become a serious economic problem in all of our large cities and is almost as bad in many small communities also because of a lack of parking regulations and a lack of proper control of moving vehicles.

As a result of this congestion great losses are being suffered daily, in both time and money. So great are the losses in time that it is impossible to calculate them, and the quantity in money reaches almost incomprehensible amounts. The Hoover conference estimated these losses at upward of $2,000,000,000 annually. Somewhere I saw a statement the other day that the monetary cost of traffic congestion in the business district of St. Louis alone was millions. Even one million seems a low estimate to anyone who has ever been caught in the midst of a St. Louis or other metropolitan traffic jam. Indeed, there have been times when I have been caught in the midst of these congested areas when I thought a million would be a reasonable price to pay to get out, if I only had the money.

Realization that traffic congestion must be relieved is becoming general, and forcible constructive steps are being taken. These are four of the useful things which civic authorities and others can do to help the situation: (1) Cut down the number of vehicles in the streets to the smallest possible number, eliminating the unnecessary and space-wasting types. (2) Divide vehicles along slow and fast-moving lines. (3) Eliminate parking of all sorts of vehicles and unloading of trucks in downtown streets. (4) Give the street cars a clear right-of-way so they will be able to render the best possible service.

These are only four suggestions. There are 100 others, but I regard these four of major importance and will discuss them briefly.

Elimination of space-wasting vehicles would be a big step. Talk of eliminating the street car in an effort to aid traffic congestion is ridiculous. Per foot of space occupied, the street car is the most economical user of street space known today. The largest possible number of passengers that any bus can carry is about 60—and this figure contemplates the use of the double-deck type. The single decker carries not more than 30. On an average it requires five double-deck buses to carry as many passengers as three street cars. Therefore, it is obvious that in seeking for economy of space, the importance of retaining street car service is self-evident.

In London, where the traffic congestion situation is the worst in the world, the governmental authorities have begun recently to limit the number of buses in the downtown section. The point was reached where buses were carrying 40 per cent of all the traffic and then the streets became so jammed that some of these had to go. If London used street cars in its downtown section instead of buses, the traffic congestion situation would not be what it is today, but London has learned this too late. It went in strong for buses years ago and did everything it could to discourage the street car, with the result that today it is paying the fiddler.

There can be no argument about the advisability of separating slow moving and rapidly moving traffic. No one appreciates this more than the automobile owner who has been caught behind a heavily loaded truck. Trucks, automobiles, and all classes of vehicles have highway rights, of course, but street car riders, composing the majority, should have precedence. Slow-moving automotive vehicles should be relegated to slow-moving traffic channels. Fast-moving automobiles should be permitted to go fast without interference. Likewise the street car should be given a clear track.

Electric railway patrons have been patient with traffic congestion. Due to curb parking, streets cluttered with slow-moving vehicles and other causes, the street car patrons, comprising 80 per cent of the city riders, have been badly delayed for years. Now, however, they are beginning to assert their rights and these rights are being recognized.

Recently the city of Chicago revised its traffic arrangements by eliminating left-hand turns and adopting a well-designed system of traffic regulation in the Loop district and thereby raised the speed of street car movements in this section from about 4 to 12 m.p.h. Cleveland and Los Angeles are making practical moves to facilitate the movement of cars through their crowded streets. The police of Philadelphia for an extended period compelled all impeding vehicles to stay off the car tracks and thus service was greatly improved for the car rider.

To summarize the situation, the modern electric railway car is the most economical user of space of all vehicles in city streets. Give it a fair chance to run unmolested by other vehicles and it will prove one of the greatest single aids to the relief of traffic congestion.

*Abstract of paper delivered before the joint meeting of the Southwestern Public Service Association and the Southwestern Geographic Division of the National Electric Light Association, Galveston, Tex., April 13-16, 1926.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 30—National Highway Traffic Association, annual meeting, Automobile Club of America, New York City.

April 30—Maryland Utilities Association, annual convention, Southern Hotel, Baltimore, Md.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Maryland Association to Meet in Baltimore

NEXT Friday, April 30, the Maryland Utilities Association will hold its fourth annual convention in the ballroom of the Southern Hotel, Baltimore.

The morning will be given over to group meetings. That on transporta-

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tion will be led by S. E. Emmons, assistant general manager United Railways & Electric Company of Baltimore. Following luncheon there will be a general session, with Senator Floyd King, L. G. Smith and R. H. Haas as the principal speakers. A sightseeing trip has been arranged for the ladies.

At the evening banquet there will be addresses by Gov. A. C. Ritchie of Maryland; H. A. Wagner, president Consolidated Gas, Electric Light & Power Company, and Gen. Guy E. Tripp, chairman of the board Westinghouse Electric & Manufacturing Company.

Hotel Accommodations at New York Convention

SECRETARY W. F. STANTON of the New York Electric Railway Association has issued a notice that the management of the Hotel Champlain, Bluff Point, has again this year made a rate of $10 per day to members. This rate includes room and meals as well as the banquet on the evening of Saturday, June 26. Applications for rooms should be made to James P. Greaves, manager Hotel Champlain, 2 West 45th Street, New York City. Persons engaging accommodations should advise the management as to day or days for which the reservations are desired and whether there will be ladies in the party.

The New York convention will be held at the Bluff Point Hotel on Friday and Saturday, June 25 and 26.

Electric Drive and Tires Discussed Before New York Railroad Club

AT A LARGELY attended meeting of the New York Railroad Club on April 16, the subject of electric drive for gasoline buses was illuminated in a paper presented by H. L. Andrews, railways department General Electric Company, who told of the development of this type of vehicle from 1905 to the present. Following discussion by representatives of manufacturers and operating companies, in which the electric drive was approved without qualification, current developments in bus tires were reviewed by Dr. H. A. Winkelman, the B. F. Goodrich Rubber Company. The balloon tire, he held, would give better riding but would not help to prevent heating unless a 21- or 22-in. diameter rim was used. Experiments with these are now being carried on, as are also tests of large single tires, to replace 6-in. duals, and of a new oval form which is being tried on 24-in. wheels. The oval tires do not increase outside tire diameter, Dr. Winkelman said, but help heating.

R. H. Horton, president Philadelphia Rural Transit Company, opened the discussion on Mr. Andrews' paper by pointing to large reorders as evidence of his company's belief in the electric drive. The value of the electric systems on steep grades under severe winter conditions was testified to by Ernest Murphy, general manager Capitol District Transportation Company, Albany, N. Y. He also referred to the greater ease of training drivers and urged the development of better tire chains, which would be easier to put on.

Other speakers were C. K. Lee, Westinghouse Electric & Manufacturing Company; Paul Weeks, American Car & Foundry Motors Company, and Charles Froesch, International Motor Company.

S. A. E. Will Discuss Bus and Trolley Co-ordination

PLANS are being made for a three-day national automotive transportation and service meeting to be held in Boston on Nov. 16, 17 and 18 by the Society of Automotive Engineers. On each day of the meeting there will be technical sessions in the forenoon and afternoon, and on the second day an inspection trip of great interest will be made to the maintenance plant of a local company operating a large number of motor trucks. The technical sessions will be devoted to discussions of problems of design, engineering, operation and maintenance of buses and trucks.

Addresses will be made by recognized experts on the subject of the co-ordination of motor bus systems and railways, the operation and maintenance of bus and truck fleets, cost of operating gasoline-electric vehicles, the braking requirements of buses and trucks and several other subjects. Members of all societies and associations that are interested in the subjects to be discussed are to be invited to attend the technical sessions of the three-day meeting and a banquet to be held on one of the evenings.

Highway Transport an Adjunct to the Rails

Civil Engineers at Spring Meeting in Kansas City Discuss the Operation of Buses and Trucks as an Aid to the Steam Railways and Electric Lines—Many Prominent Operators on Program

MOTOR transport and its relation to steam and electric railway service was the subject of the spring meeting of the American Society of Civil Engineers held at Kansas City, Mo., on April 14. More than 400 engineers attended the two-day meeting, which was addressed by such leading transportation men as Ralph Budd, president Great Northern Railway; Britton I. Budd, president Chicago, North Shore & Milwaukee Railroad and other companies; Fred G. Buffe, general manager Kansas City Railways; Robert P. Woods, vice-president and general manager Kansas City, Clay County & St. Joseph Railway, and Arthur H. Blanchard, professor of highway engineering, University of Michigan.

Ralph Budd introduced the subject in a paper on the relation of highway transportation to the railway. He sketched the growth of the transportation plant in the past 25 years, stating that in this time the American public has increased its investment from $10,500,000,000 to more than $50,000,000,000.

Frequency of service due to its lower operating cost and flexibility as compared with the steam train were given by Mr. Budd as reasons for the success of the bus in certain localities. It has regained business which had been lost to the railways prior to giving the service on the highway. Figures were given to show that the private automobile had been a more deadly competitor to the railway than the independent motor bus, at least in Minnesota. It seems clear, he said, that the railroads must recognize that public necessity and convenience require the development of transportation on the highways.

Regulation is necessary, and in 37 states measures of this character have been adopted. Federal regulation of interstate bus and truck operation sooner or later is inevitable. The bill now pending in Congress, as drawn, is intended not to hinder or hamper the development of common carrier transportation on the highways, but to protect the legitimate operator.

Common carrier vehicles should pay a fair and reasonable tax for the use of the highways, but regulation should not be attempted through taxation. Those who choose not to drive their own cars but to ride in common carrier vehicles should not be asked to bear an unfair share of the burden of upkeep of the highways, nor should they be deprived of cheap transport because public motor vehicles are taxed too high. In general Mr. Budd feels that taxes paid by buses are fair and just, although there is a wide diversity in methods of taxation.

As to who should operate on the highways, Mr. Budd said:

> Whether a railway company itself should own and manage buses may depend on its willingness or unwillingness to take on additional obligations and responsibilities, but if no prejudice exists against bus operation, the deciding question probably will be whether, by such control, wasteful duplication can be eliminated and the service improved. There have been instances where, by co-ordinating the schedules, bus service has supplemented train service, to the end that for a lesser total expenditure a more complete and satisfactory service has been rendered. Each case is one for individual consideration.

Summarizing, Mr. Budd held that when essential carriers are able to give service that is measurably similar to that proposed, or where the success or efficiency of the existing essential carrier would be seriously impaired without definite and distinct improvement in service to the public, then public necessity does not warrant the new facility and it is in the true public interest to deny the application. On the other hand, where such additional facility is in the public interest and is permitted it should not be hampered by undue restriction or unfair taxation, but should be encouraged to operate as efficiently and cheaply as possible.

Discussing the paper, J. V. Hanna, chief engineer Kansas City Terminal Railway, said that in his belief loss of passenger business by the railroad is attributable largely to the private automobile and less to the bus. The bus will never take the long-haul railroad business, but will find its own economic position in transporting passengers for not over 150 miles.

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E. A. Hadley, chief engineer Missouri Pacific Railway, believes that motor vehicles do not pay their fair share in the construction and maintenance of highways. Taxes on railroads help build highways, but the converse that taxes on motor vehicles help build railways is not true.

C. E. Loweth, chief engineer Chicago, Milwaukee & St. Paul Railroad, holds that railways should obtain suitable sites for outlying terminal facilities and use the bus for transporting passengers to the business district.

Professor Blanchard urged co-ordination. It is his view that the bus and motor truck have come to stay, and that there will be a readjustment of the economic field of the railway due to their advent. He gave a number of illustrations of how the highway vehicles may be fitted into the plan.

Mr. Woods pointed out that motor buses are in operation where formerly there was no transportation. They can be used as feeders to steam and electric railways and for special trips. He believes that as an independent unit of transportation in the interurban field the bus will be spotted. If the volume of traffic is heavy it will probably be forced to secure private right-of-way, which would be required to maintain speeds and prevent traffic congestion. Duplication of existing facilities must be avoided, as it is an economic loss paid by the public in the long run.

Reviewing the situation, he pointed to Kansas City as an example. Twenty separate lines of interurban buses are operated from this point to seventeen other terminals. Competition extends over three and part of a fourth of these seventeen routes and all cover territory served by steam railroads. The total length of highways traversed by the seventeen routes is 1,773 linear miles. The rates of fare vary from 1.7 cents per mile to 3.9 cents per mile. It is believed that, as a whole, these lines have shown no profit.

Experience of the Kansas City, Clay County & St. Joseph Railway was cited. A bus line was started in competition with the rail line to Excelsior Springs early in 1924. In August of the same year the railway interests also began operation of a bus line over the same route. Later two non-competing lines were started by the railway. An agreement has been reached with the independent bus operator so that equal service is given on the two lines.

Notwithstanding the frequent and high-grade service given by the two bus lines to Excelsior Springs, with combined service twice that of the electric, business has been falling off steadily on the bus lines and that on the interurban has been increasing. During 1925 the electric line, furnishing about one-third the total combined service, carried twice as many passengers as the two bus lines, while for the last five months of that year it carried 2½ times as many, indicating that the popularity of the electric line is growing. For the first three months of the current year the number of passengers on both the bus lines has decreased about 32 per cent, while the number of passengers on the electric line has increased some 33 per cent, which means that the latter carried 2.94 times as many passengers as both bus lines. In this period the electrics supplied 38 per cent of the total vehicle mileage.

Therefore, with rates of fare practically the same on the railway and the two bus lines, the combined motor bus patronage with its extensive service decreased as compared with the year previous, with the rate of decrease growing greater. Whether this tendency will hold or not is problematical, said Mr. Woods. The motor bus, however, is here to stay. Adjustments will be made from time to time and gradually there will be a real co-ordination with the other long established and more reliable transportation carriers.

The papers by Britton I. Budd and Fred G. Buffe are published in abstract on pages 715 and 717 of this issue, respectively. Both of these speakers felt that there is a definite place for the motor bus, and that everything should be done to help define the possibilities and limitations of this new form of transportation.

No Joint Convention in Wisconsin

PUBLIC utility companies in Wisconsin have decided to forego the usual annual general convention of the Wisconsin Utilities Association this year and substitute therefor a convention by means of the association bulletin.

Election of officers will take place by mail. Reports of officers and committees will be printed in the bulletin issued and edited by John N. Cadby, executive secretary of the association. The results of the election and the reports will be published in the association's bulletin which will be issued on May 1.

"This action has been taken," said President George H. Wilmarth, "to cut down expenses occasioned by a general session. Our association is divided into gas, electric and street railway sections and these sections will hold individual conventions this year."

Midwest Convention in Denver July 8-10

DENVER, COL., is the chosen spot for the Midwest Electric Railway Association to hold its annual convention. The dates will be July 8-10. Headquarters will be at the Brown Palace Hotel. Subjects to be included in the program are: The electric car of the future, modern equipment, its maintenance and inspection, modern city track, the human element in the industry, mass transportation and the automobile, fares, passes and transfers, the interurban bus.

Among the diversions promised to delegates and their wives is a series of mountain trips which is being arranged by the Denver Tramway.

American Association News

Special Trackwork

INSPECTION clauses, design for oval and elliptical bolt holes in splice bars, and procedure in preparing specifications were among the subjects discussed at a meeting of the sectional committee of the American Engineering Standards committee on specifications for special trackwork materials and design of 7-in. plain girder rails, held at association headquarters, New York, April 14. Members present were: V. Angerer, chairman; C. A. Alden, E. B. Entwisle, G. L. Fowler, J. E. Davidson, representing Mr. Strong, R. E. Hess representing Mr. Young, E. M. T. Ryder, E. F. Kenney, R. C. Cram and H. H. George.

Switch Tongues and Hard Centers

DISCUSSION of desirable features in the design of center plates and tongue switches occupied special committee No. 2 of the way and structures committee on design of switch tongues and hard centers for special track at its meeting held at association headquarters, New York, Thursday, April 15. The committee is endeavoring to decide on features of design of center plates, that can be made uniform. Some uniform dimensions for hard centers for various conditions of special trackwork were decided on. In the discussion of the proposed association standard tongue switch, devices for holding down the heel of the tongue and also for holding it back in normal position were problems that occupied the committee's attention. Certain additional features of design are to be worked out and presented at the next meeting, which will be held in New York April 28.

Those present at the meeting were E. M. T. Ryder, chairman; C. A. Alden, H. S. Heyl, G. A. Peabody, W. W. Wysor, and E. B. Entwisle.

Metropolitan Section's "Peddlers' Night," May 7

MEMBERS of the Metropolitan Section of the American Electric Railway Association are invited to go to Keen's Chop House, 36th Street east of Sixth Avenue, New York City, on Friday evening, May 7, and meet their friends and the peddlers at a real Dutch treat dinner. After their hunger has been satisfied adjournment will be made to the Engineering Societies Building, 33 West 39th Street, where the section will be entertained. The meeting will be in charge of the ambassadors of industry, otherwise known as "peddlers." W. H. Woodin, president American Car & Foundry Company, will be the principal speaker of the evening. Capt. Irving O'Hay, the original "Soldier of Fortune," the hero of Richard Harding Davis' book by the same name, also will speak. There will be movies, too. Hollis Sisson will present on the screen "Cub Life of a Peddler."

This will be the last event of the season for the Metropolitan Section.

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The News of the Industry

Funeral Oration Over the Electric Railway

L. F. LOREE, president of the Delaware & Hudson Company and an officer of the Kansas City Southern Railroad, in an address before the St. Louis Chamber of Commerce, on Friday, April 8, expressed it as his opinion that the country could "wipe off the books the six thousand million dollars invested in electric street and interurban railroads because the automobile truck and motor bus had placed them in the discard as effectively as the steam railroad shelved the stage coach and stage coach tavern during the last century."

Mr. Loree admitted that the steam railroads also have a battle on their hands to combat motor bus and truck competition, but contended that they would win the fight if left to solve their own problems in their own way.

He expressed the belief that the federal Congress recognized the wisdom of such a "hands-off" policy toward the railroads since the government, through the transportation act of 1920, had taken the initiative in advocating consolidations of the railroads in several large groups such as he proposes to do with the Southwestern roads serving St. Louis and Kansas City.

His funeral oration for the electric railway industry was heard by several of the men interested in the St. Louis Public Service Company, which will shortly take over the operation of the United Railways Company's properties, including the St. Louis Bus Company.

Settlement in Sight in Ontario

Hamilton, London and St. Thomas a Little Nearer a Solution of Their Transportation Problems

FOUR months have elapsed since abandonment of railway service was threatened in three Ontario cities, namely Hamilton, London and St. Thomas. Last minute negotiations saved the day temporarily in Hamilton, where the point at issue was a franchise agreement, and in London, where the jitney was the bone of contention. In the former city a new agreement is ready to be presented to the voters and in the latter another extension of the temporary agreement insures railway service for a while longer. In St. Thomas, however, the railway was doomed from the start and buses supplanted the railway line in that city on March 1.

Agreement was reached by the Hamilton Street Railway, Hamilton, Ont., and the special railway committee of the City Council on March 15 upon the terms of a new franchise, which will be submitted to the voters on May 3.

The provisions state that the present franchise and by-laws governing the railway should be maintained, except where otherwise specified, and that the fares be 5 cents cash or five tickets for 25 cents, with children half fare or 3 cents each. The Police Commission is ordered not to issue any jitney licenses, as the company has agreed to running rights for jitneys for two years. The company, however, is permitted a sufficient number of buses of an approved type for operation on such streets as the City Council may determine. In place of the present percentage provision it is provided that the company shall be entitled to an annual profit of $120,000 in any year that its earnings will warrant, plus 7 per cent upon its new capital investment, the city to receive at least 4 per cent of gross receipts in any year in the event of an increased fare on June 30, 1928, up to which time a 5-cent fare will be maintained on cars and buses.

A schedule of construction was adopted, together with the supply of new equipment as follows: For the first year 24 new cars with eight buses or cars and reconstruction of King Street tracks; for the second year, twelve new cars and four buses or cars, one new carhouse and repair shop, at an estimated cost of $250,000; for the third year, twelve new cars, four buses or cars.

The franchise is to last for 25 years, with the right of either party to take any matter in dispute to the Ontario Railway and Municipal Board except the matter of fares. This question shall only be raised at fixed periods by either party giving three months' prior notice of its intention to appeal.

The expected suspension of railway service and the eleventh hour aversion to it in Hamilton were brought about by the defeat of the two railway by-laws on Dec. 7, referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 11, 1925, page 1048. The people at that time opposed the city's purchasing the system and also opposed the company's receiving a 25-year franchise. To insure continued service the City Council approved a plan to submit a new agreement to the people.

In London, as in Hamilton, abandonment was averted in December, 1925, by announcement of a special meeting of the City Council called in an endeavor to have the railway continue until a new franchise could be discussed. Recently the City Council of London, Ont., discussed the present condition of negotiations with the London Street Railway and passed a resolution extending for 60 days the temporary agreement made in December, 1925, for a continuance of a straight 5-cent fare for 90 days. The Council declined to authorize the engagement of an expert to assist the committee in the negotiations.

In St. Thomas the Metropolitan Bus Lines of Toronto is supplying a service to approximately 19,000 people at no cost to the municipality, for the company asked no bonus or other consideration in taking over the operating franchise. The only concession made to the company was the use of the railway carhouse to store the buses. Four coaches are doing the work formerly done by eight street cars. Routes have been extended to all parts of the city and a fifteen-minute service is being provided to the most distant sections. In order to meet the increasing demands of the public, the company is placing a fifth bus in operation. It will be used largely for emergency purposes and on special occasions. With Sundays excepted, the buses have been carrying an average of nearly 2,000 passengers daily since their introduction. The buses are operated on a 7-cent fare with four tickets for 25 cents.

When the ratepayers of St. Thomas voted late last year to discontinue the street cars and accept a proposition for the operation of buses it became the first city in the Canadian province to scrap its railway and turn to buses.

Rehabilitation Plans Considered at Toledo

Engineers representing Henry L. Doherty & Company have been in conference with Prof. Henry E. Riggs, who recently made a survey of the transit situation at Toledo, and many points in the reports have been agreed upon preliminary to placing some definite program before the City Council at Toledo.

It has been determined that approximately $2,860,000 of new capital will be required to carry out the plans agreed upon for rehabilitation, establishment

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of supplemental bus lines, segregation of offices of the Community Traction Company, building bus shops and making other capital expenditures.

Rerouting in Toledo would save about 230,000 car-miles a year, or $57,500 at a conservative cost basis.

Mayor Fred J. Mery and Chairman David Goodwillie of the street railway board of control conferred with the Doherty representatives at Ann Arbor and reported that an early settlement seemed possible, but that changes in the Milner ordinance would be required and the citizens would have to approve franchise amendments.

The question of raising new capital is quite vital. All are agreed that the Doherty interests will probably have to be depended upon for the added investment and that a monopoly of transit business in the city will have to be granted to secure the necessary funds.

No decision has been reached upon the plan of concentrating city control in the street railway board, abolition of the sinking fund-city purchase plan and some other changes vital to the present Milner ordinance.

In the meantime a local company, known as the Toledo-Point Place Coach Line, Inc., has submitted to the City Council a proposed franchise for a system of bus lines involving ten routes which do not conflict or compete with street railway lines except in a few short sections. The company proposes to operate on 10-cent cash fare, 5-cent children's fare and free transfers.

Mayor Mery has stated that the city will go slow on any independent bus move until the present negotiations on the Riggs report are brought before the City Council.

Several other proposals for independent city bus lines now before the Council have been awaiting settlement of the street railway problems.

John D. Ryan Offers Intimate Information

Anaconda Official Discusses Electrification of the Chicago, Milwaukee & St. Paul Railroad at Meeting Before Interstate Commerce Commission

J. D. RYAN, president, chairman and director of many companies, testined on April 12 before the Interstate Commerce Commission at the inquiry into the financial affairs of the insolvent Chicago, Milwaukee & St. Paul Railroad. Mr. Ryan said he had favored electrification of the St. Paul's Puget Sound extension as good business for his power interests, and he considered it a splendid thing for the development of the St. Paul. The cost of this work is said to have been $200,000,000. Some security holders have charged that this electrification was one of the chief causes of the road's financial collapse.

Mr. Ryan explained that the St. Paul pays for about 20 per cent more power than its maximum requirement, but that the arrangement was really good for the railroad because it saved through the operation of longer trains and heavier loads. He declared the St. Paul was getting the lowest price in power aver procured.

Mr. Ryan testified that while he was a director of the St. Paul, and at the same time chairman of the board of directors of the Anaconda Copper Company, the St. Paul had purchased from the Anaconda $5,500,000 worth of copper. The metal was bought through the United Metals Company, selling agency for the Anaconda. Mr. Ryan is quoted as follows:

> I was personally interested in electrification because this would provide the source for the use of power and copper on a large scale, but I never had any doubt that it was of benefit to the St. Paul to electrify its system in Montana. I was very careful all the way through not to take an active part in promotion of this project to electrify the Puget Sound division. I thought then and I think now that electrification is a good thing for that part of the St. Paul.

Mr. Ryan said the contracts entered into by the St. Paul for electric power with which to operate its trains were three in number, covering the Rocky Mountain, Missoula and Inter-Mountain divisions. In only two of these did Mr. Ryan have any interest. The witness recalled how he and his associates had acquired an interest in the Great Falls Water Power & Townsite Company from the late James J. Hill in 1909, and followed this by relating how the Montana Power Company took over this interest along with the Butte Electric and the Missouri River Power Company in 1912. The contract between the St. Paul and the Montana Power Company was signed in November, 1912, he said.

Regarding the Thompson Falls Power Company, Mr. Ryan said that he and his partner, J. G. Maroney, turned over their half interest in this company to the St. Paul at cost, $100,000, and at the request of St. Paul officials acquired the other half interest for $200,000, also at the figure at which it had been acquired. The Missouri River Power site was added to St. Paul's holdings for another $100,000, but when these items had been acquired it was deemed advisable to let them go on a contract basis. St. Paul thereupon resold the property for a consideration of $950,000 and a contract for power to its Missoula division.

Progress Report on Florida Interurban

Reports on the progress of the construction of the line of the Florida Interurban Rapid Transit Company between Tampa and St. Petersburg were made at the recent annual meeting. Calvin A. Owen, president of the company, said that 96 per cent of the right-of-way between Tampa and St. Petersburg had been acquired; that franchise and track lease contracts had been granted by seven municipalities, through which the interurban system will pass; that the bridge over the Hillsborough River at Michigan Avenue is 76 per cent completed and that track construction work on the St. Petersburg end will start at an early date. The company located at 804 Twiggs Street, Tampa, will operate gas-electric cars.

Paving Bill Lost in New York

The Thayer bill amending the railroad law in relation to the paving obligations of street surface railroad corporations has been lost. When called up for final passage on the day of adjournment the measure was recommitted to the rules committee on motion of its introducer. It was sought to strike out the provision that the pavement shall be laid and maintained between the rails of the tracks and 2 ft. outside the tracks and adding a new provision that such pavement shall be maintained 8 in. on each side of each rail. The bill was reported out of committee in the Senate on April 22, but as in its amended form it had not been on the desks of the members for the statutory three days, it was laid aside until April 23.

Council Considers Richmond Franchise

With the purpose in view of taking up and disposing of the proposed blanket franchise for the traction lines of the Virginia Electric & Power Company the streets committee of the Richmond City Council was scheduled to meet on April 20, when the franchise as drawn by the city attorney, at the request of the committee, would be discussed and acted upon. After a three-hour discussion on April 20 the committee voted four to four on the purchase clause in the franchise. The final vote on the matter was: For the Virginia State Corporation Commission's valuation, Rice, Gunst, Carpenter and Ledbetter; for arbitration, English, Puller, Atkinson and Sullivan.

Two propositions were placed before the committee on the question of the valuation of the Virginia Electric & Power Company's property. One was to accept the value of $9,750,000 fixed by the corporation commission; the other was to set the value by arbitration. This part of the ordinance provides that if the franchise for the railway is awarded to a third interest, the Virginia Electric & Power Company will sell its railway interests to this concern. The controversy was over the valuation the company should receive for its property.

Samuel L. Kelley, representing the Jenkins interests, who, it is understood, may be bidders for the franchise, argued that the $1,250,000 put on the valuation by the corporation commission as a "going concern" should be stricken from the purchase clause. He also said that the would-be purchaser probably would not want Forest Hill Park, which is valued at $106,000, or the office building owned by the company.

T. Justin Moore, general counsel for the Virginia Electric & Power Company, said that the amount added for "going concern" should be included in the purchase price. Luke C. Bradley, president of the company, said that the matter was a "give-and-take" affair. He merely sought a proposition on which his company could receive a fair return on its investment.

Officials of the company said they would not accept the arbitration plan, but would accept the corporation commission's value.

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Terms of New Chicago Franchise Taking Shape

Final consideration of the completed new traction ordinance at Chicago was begun recently by the committee on transportation of the City Council.

The ordinance provides for a downtown subway, to be built by special assessment, with the city paying a public benefit out of the traction fund. The subway on completion is to be leased on a rental basis.

The ordinance grants to an unnamed corporation a permit to operate surface cars, buses and other means of surface transportation for an indefinite term, but subject at any time to revocation by the City Council.

The ordinance is based on the "terminable permit" idea. Necessary legislation to make the terminable permit idea effective will be sought from the Legislature as soon as the people have expressed themselves in a referendum on the traction ordinance.

One of the most important features of the ordinance is a provision for unification of service of the various transportation systems, without financial unification. It contains a provision for a city commission of five members to be appointed by the Mayor with the consent of the Council to regulate service and fares.

Fares are to be established on a service-at-cost basis, with a "barometer" provision for automatically increasing or decreasing the fare if the earnings rise above or fall below an established level.

Compensation is to be paid to the city on a percentage basis. The city's share is to be accumulated in a special fund similar to the present traction fund.

The ordinance also creates an amortization fund. It provides that extensions shall be ordered by the City Council. The number of miles of extensions immediately necessary is to be fixed by the measure with a limit to the time in which this work must be done.

Purchase of Philadelphia Taxis Approved by P. S. C.

Purchase of the stock of the Yellow Cab Company, Philadelphia, by the Philadelphia Rapid Transit Company was formally approved by the Public Service Commission on April 21. It is probable that actual operation of the cabs by the railway will begin in July. An additional issue of P. R. T. preferred stock to the extent of $5,000,000 has been authorized by the City Council and will be placed on the market to accomplish the purchase of the assets of the taxicab company.

"Growing Up with the Tri-Cities" Tells Its Own Story

In connection with the public opening of the United Light Building of the Tri-City Railway & Light Company, Davenport, Iowa, on April 15 and 16 the company has issued an interesting illustrated pamphlet of 32 pages reviewing the growth and history of the utility development in the Tri-Cities. The interest in the historical detail is enhanced by the reproduced photographs of the various men in the industry who served the public from time to time. "Growing Up with the Tri-Cties," the name of the pamphlet, stresses the idea that the land around Davenport lent itself as a natural utility center.

No Exterior Advertising on Oakland Cars

Billboards or exterior advertisements must not be placed on street cars in Oakland, Cal. An ordinance just passed makes violation of this rule a misdemeanor. The measure was passed unanimously by the city officials and no opposition was voiced at the hearing, although it is rumored that there may be a subsequent court test case. The only traction company affected by the new law is the Key System. A little more than a month ago this company equipped its cars with boards, two on each side, on which advertisements were carried. The prohibitory ordinance was enacted by request.

Names Selected for Atlanta Interurban Cars

Fourteen Atlanta men, elected by the trolley riders, will be commemorated in naming the new interurban cars for the Stone Mountain and Marietta lines, according to an announcement just made by the Georgia Railway & Power Company. The cars will be put in operation shortly. The names selected are: Joseph E. Brown, Joel Hurt, Richard Peters, A. Stephens Clay, Joel Chandler Harris, George W. Adair, Evan P. Howell, Lemuel P. Grant, Capt. W. R. Joyner, George W. Scott, Alfred H. Colquitt, Milton A. Candler, John B. Gordon and Peter Caldwell. All these men contributed some service to the community life of Georgia. The two conditions of the contest were that no name would be considered unless the man commemorated was dead, and that patrons must give their reasons for selecting the particular name turned in. A great deal of interest was aroused in the campaign for naming the cars and the names selected are those which received the majority of votes from patrons of the two lines.

The new cars will be put into operation some time during the summer.

Worcester and Springfield Bill Reported Favorably

After many delays the committee on railroads of the Massachusetts Legislature has voted to report a bill permitting the New York, New Haven & Hartford Railroad to purchase the capital stock of the New England Investment & Security Company and the Springfield Railways, which control the Springfield Street Railway, and the Worcester Consolidated Street Railway.

The new bill contains provisions which permit either of the cities to veto propositions with respect to properties within their own limits, unless improvements satisfactory to them are made by the railroad.

Further Study of Boston Subway Asked

An appropriation of $25,000 for further study of the proposed subway under Huntington Avenue and Stuart Street, Boston, which would extend across the street to Summer and thence State Street, is asked by the special commission created at last year's legislative session to consider the project. The commission seeks an extension of time to Dec. 15. The report says that the project cannot be considered apart from the general plan of rapid transit facilities for Metropolitan Boston. The studies of the commission to date suggest two alternative routes to serve the Huntington Avenue district.

Wage Parleys Continue in New York State

The opening conference between representatives of the Rochester, Syracuse and Utica employees of the New York State Railways and James F. Hamilton, president of the company, came to an abrupt end on April 19 without arriving at any agreement on a new wage and working contract for the year beginning May 1. Neither party would state the reason for the end of the parley, but each was emphatic in stating that there was no deadlock and that a settlement would soon be reached.

The platform men have asked for a 10-cent-an-hour wage increase and a six-day week. Members of the union joint board are not insistent on the latter demand, but believe they are justified in asking the pay increase because the company has been allowed to increase its fare to 8 cents in Rochester and has applied for an advance in Utica and Syracuse.

The company contends that its finances will not permit of a wage increase and that whatever gain in revenues may be realized by the higher fare will be offset by heavy demands for road maintenance in all three cities.

The applications for an advance in fares in Utica and Syracuse from 7 to 10 cents is before the Public Service Commission and the delay in bargaining is due, in part, to both the men and company awaiting decision on this matter.

Rochester employees sought to make demands independent of the unions in the two sister cities. Whether separate request was made was not disclosed. The Rochester workers believe their position is enhanced by the increased fare, which became effective in their city on Jan. 1.

At present city motormen and conductors receive 55 cents an hour, interurban men 57 cents an hour and one-man operators 60 cents. The latter class predominates in Utica and Syracuse, with a few in Rochester. Part of the conflicting demands of the unions of the three cities rests on this fact.

The present contract expires on May 1. Should no settlement be reached by that time any subsequent agreement would be retroactive to that date. Further conferences between the two parties to the agreement are scheduled for the immediate future.

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One-Man Cars Upheld by New Jersey Board

Another decision has been handed down in favor of the one-man car. This time the Board of Public Utility Commissioners of New Jersey declined to make any change in the operation of the one-man car system by the Public Service Railway along the Leonia line between Edgewater Ferry and the town of Leonia, but said it would keep under its supervision the continued operation and would make such further investigation and check the traffic conditions as the situation seemed to demand.

In addition to complaining that the service was not adequate the petitioners complained that the one-man operation was unsatisfactory, inasmuch as it placed upon the operator numerous duties which heretofore had been performed by a conductor. It was brought out in the testimony that the respondent, since the adoption of the basic 5-cent zone fare and as part of the general program to promote and maintain such a rate of fare throughout its system, had been obliged to effect numerous economies in operation that the system might be operated in such a manner as to produce revenue in excess at least of operating expenses.

The board said:

> Counsel for the petitioners requests that the company operate during the rush hours a two-man system as an alternative to an all-day operation of this kind. The board is of the opinion this should not be ordered at this time. It would increase the cost of operation, and while it might add somewhat to the efficiency of the service it is doubtful whether the cost involved would be justified or that the service, promptly operated, would require it. The use of the one-man car is general by the respondent throughout the entire state and operating conditions on the Leonia line are not materially different from those in many other localities throughout the system, particularly during the rush hours. There is, therefore, no reason why the company cannot better the standard of service on this line even during rush hours and still maintain the one-man operation.

Wage Agreement at Pittsburgh Renewed

Seventy-five per cent of the 3,200 motormen and conductors of the Pittsburgh Railways, Pittsburgh, Pa., voted on April 11 to sign up with the company on another two-year agreement at the present wage scale. Announcement of the vote ended all possibility of difficulty in settling the terms of the new agreement, which will become operative May 1. The present-two-year agreement expires April 30.

The trainmen sought a wage increase of 8 cents an hour. This was met by the company with the statement that it "would if it could, but it couldn't." There was not sufficient revenue to cover any increase.

The men presented ten demands in all, but the one on wages was the most important.

At the two meetings of the men, the union officials reported on details of the conferences of the wage committee with the company representatives. The men were told that when the request was made for an increase in wages, A. W. Thompson, president of the railway, replied that it was financially impossible to meet the request, with the company treasury in its present condition. Mr. Thompson had told the wage committee that the company's surplus for 1925 was only $52,000. He said that a wage increase of 1 cent an hour would cost the company $88,000 a year. On that basis an 8-cent increase would add $700,000 to the company's expenses.

W. B. McKinley Defeated by F. L. Smith

Col. Frank L. Smith, chairman of the Republican state central committee of Illinois and the State Commerce Commission, won the party nomination for United States Senator over the present incumbent, William B. McKinley, at the primaries on April 13. Colonel Smith's campaign all over the state was based on his opposition to the World Court. The result is taken by Smith's friends as a repudiation of the course of the administration in urging American entry into the World Court. In Chicago Smith was opposed by the Amalgamated. That body adopted resolutions refuting the claim that Smith has been a friend of organized labor. In fact, the union said that the organized electric railway workers of Chicago and their families had suffered through his unreasonable and unfair attitude toward them. Mr. McKinley is chairman of the board of directors of the Illinois Power & Light Corporation.

New Franchise to Go Before Omaha Voters

Residents of Omaha, Neb., will have submitted to them on May 18 for a vote the question of granting a new franchise to the Omaha & Council Bluffs Street Railway. The ordinance covering the terms of the new grant is now being advertised. It was passed by the City Council on March 30. The consent will expire 40 years from the date of acceptance and the grant is to be neither exclusive nor perpetual as to buses or street railway system, or both. Right is reserved to the city to acquire the property and take over its operation. In the event of any such purchase by the city it is specifically provided that no claim of value shall be allowed for the franchise.

P.R.T. Pushes Work on Lines for Sesqui-Centennial

Rapid strides are being made by the Philadelphia Rapid Transit Company and the city of Philadelphia in preparation for the handling of the immense crowds which the Sesqui-Centennial Exposition will occasion. Work is being pushed day and night seven days in the week in an effort to have the transportation arrangements completed for the scheduled opening on June 1. When it is remembered that six weeks ago not a spadeful of earth had been turned in preparing the trackwork and streets which will handle the traffic to the grounds, some idea of the magnitude of the present task may be had.

The cost of the exposition improvements to P.R.T. alone will be $2,000,000. This does not include the expense involved in grading and paving the streets, a burden which has been assumed by the city. Nor does it take account of the cost of new street cars and buses which are being purchased, as these will eventually be absorbed in the general expansion and improvement of the P.R.T. system.

In all 6 miles of tracks are being laid in connection with the Sesqui-Centennial. No street cars or buses will enter the exposition grounds proper, but P.R.T. will have the concession for all intrarural transportation within the grounds. Bus equipment to be used in conjunction with street cars to bring the crowds to the grounds will have a capacity of 10,000 passengers an hour, while the cars themselves will care for 52,000 persons an hour.

$1,000,000 Surface Lines Suit Decided Against Chicago

Suit by the city of Chicago against the Chicago Surface Lines for interest on payments which the city refused to accept between 1918 and 1923 on the grounds that its case in the fight waged at that time for lower fares would be prejudiced was lost recently when Judge McKinley in the Municipal Court gave his decision in the case.

Judge McKinley ruled that because the city had refused to accept 55 per cent payments of net receipts, it was not eligible to collect interest on the money. The city had claimed that it was entitled to interest of 5 per cent, which would amount to approximately $1,000,000. The city attorneys announced they would appeal.

Railway Service Satisfactory

Selectmen of Sterling, Mass., have refused the Lovell Bus Lines, Inc., a Maynard, Mass., concern, a permit to operate a bus line from Sterling to the Leominster line. The Lovell line now operates from Sterling to Clinton. The action was taken on the ground that the service furnished by the Worcester Consolidated Street Railway and the New England Transportation Company is satisfactory. The original plan, to have a loop line from Leominster to Clinton through Sterling, was abandoned because of the action of the Selectmen. The Lowell line has not indicated whether it will discontinue the Clinton to Sterling service because of the action.

Louisville Conductor Wins Award

George W. Keene, a conductor of the Louisville Railway, Louisville, Ky., has won the A. F. Connelly Award, offered by an unnamed director of the Louisville Railway for "general excellence." The winner received credit for stimulating employees to take an interest in safety work. The award is a memorial to the late A. F. Connelly, superintendent of city lines. It carries with it a cash prize of $75, a gold medal and a trip to the American Electric Railway Association convention to be held in the fall at Cleveland. Two others received bronze medals. These men were Sherman S. Satterley and C. H. Bryant.

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News Notes

Guide Book for Birmingham. — The Birmingham Electric Company, Birmingham, Ala., has published a booklet entitled "Places of Interest in Birmingham and How to Reach There." A copy has been given to every street railway motorman and conductor in the city. A map of the entire district and a detailed map of the downtown district are included, with an alphabetical list of places of amusement, industrial plants, hotels, apartments, churches, clubs and theaters.

Franchise for Bellefontaine Rejected. —With the rejection by the City Council of Bellefontaine of a new franchise submitted by the Indiana, Columbus & Eastern Traction Company, it is said the next move by the traction company will be in the courts. The proposed new franchise provided for a slight increase in local fares on the regular cars and would have run for 25 years. It was advanced with the idea that under the grant the company could decrease its expenses in Bellefontaine and thus provide funds for the company's share of street paving in North Main Street. The company objected to this expense on the grounds that it is in the hands of receivers and its revenue does not justify expenditure.

Wages in Memphis Will Be Arbitrated.—Arbitration will settle the wage dispute existing between the union employees and the management of the Memphis Street Railway, Memphis, Tenn. The local has named A. B. Galloway its arbitratior and the company named Lovick P. Miles as its arbitrator. These two will choose a third as per the contract, and the wage scale for the next twelve months will be fixed by them, effective as of April 1, 1926. The men have been seeking an increase of 12 cents an hour. An agreement has been reached on working conditions.

Transfer Arrangement Will Not Be Contested.—The proposed new tariff of the Seattle & Rainier Valley Railway, Seattle, Wash., under which transfers to the Seattle Municipal Railway lines will be given only on 10-cent cash fares, and not on 8⅓-cent tokens, as heretofore, will not be protested by the city of Seattle, according to a recent decision of the City Council utilities committee. Clark R. Jackson, superintendent of the Public Utilities Department, declares that in his belief the city could not successfully sustain a contention that the increased rate is not justifiable. The new tariff will go into effect April 25, unless the State Department of Public Works suspends it.

Theater Tickets a Reward for Courtesy.—When trainmen of the Indianapolis Street Railway, Indianapolis, Ind., complete 30 working days, giving 100 per cent service during that period, they receive two tickets to B. F. Keith's theater in Indianapolis. This is provided under the rules of a "courtesy campaign" being conducted by the company. Approximately 300 motormen and conductors have successfully completed the first 30-day working period of perfect service and have received tickets, according to an announcement by James P. Tretton, superintendent. The new "bonus" plan has stimulated courteous service on the street car lines, Mr. Tretton said, to say nothing of enlivening some dull theater nights.

Auburn Wage Issue Up.—Employees of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., desire a wage increase of 8 cents an hour. The present contract expires on May 1. It calls for a 49-cent-an-hour wage on city cars, 50 cents on interurban cars and 52 cents an hour on freight runs. In a letter signed by W. J. Harvie, vice-president and general manager, notice has been given to the union officials that the company wishes to cancel the contract with the latter organization on May 1.

Will Co-operate with Radio Users.—Co-operation is being secured from the utilities in central Indiana by radio users and dealers toward the elimination of electric interference. A letter from the superintendent of the Indianapolis Street Railway says that that company stands ready to remedy any condition of its tracks or cars that might interfere with radio reception.

Fare Changes in Brockton.—Albert J. Boardman, local manager Eastern Massachusetts Street Railway, recently announced fare changes on lines operated from Brockton, Mass., to nearby towns. The fare from Brockton to Mattapan has been reduced from 70 to 50 cents. Reductions of 10 cents were made in fares to East Bridgewater and Bridgewater. Other reductions in fares have actually been accomplished by extending zone limits with change in rate. On the Taunton line an extension in zone limit has been made.

Easter Morning Traffic Heavy.—More than 19,000 people used the street cars provided by the Los Angeles Railway, Los Angeles, Cal., to go to and from the sunrise Easter service at the Coliseum. While it was anticipated that 80,000 people would go to the Coliseum, the attendance was less than 60,000 on account of the uncertain weather. In "Direct to Coliseum" service Easter morning were 113 cars, which made 317 trips.

Accident Reduction in New Orleans.—As the result of a friendly rivalry between motormen and conductors of the several carhouses of the New Orleans Public Service, Inc., New Orleans, La., the company has succeeded in greatly reducing the number of accidents on its street cars. There were 1,800 fewer accidents on record in 1925 than there were the year previous. There were 5,500 accidents, all told, reported during the year, only five of which were of a serious nature. Automobiles are declared, by the company, to be the greatest single cause of accidents, 2,500 of these accidents in 1925 having been due to collisions between automobiles and street cars. The award extended to the employees of the carhouse reporting the lowest percentage of accidents is a white pennant which is flown over the carhouse and the wearing by the men of a special insignia. The campaign, started in April, 1924, is under the direction of D. C. O'Dowd, superintendent of transportation.

Foreign News

Independents Fight Reduction of London Bus Service

London's bus warfare is still raging, 37 summonses having been issued recently to bus owners flying the independent flag in defiance of the traffic order which became effective March 29. The London General Omnibus Company has taken off the route the required number of ten buses. But the small owners, numbering about twenty, have continued to operate.

The advisory committee's first step was to cut down bus service on Uxbridge Road, as told in the ELECTRIC RAILWAY JOURNAL April 10, and the second to issue orders reducing the number of bus services on the routes from Wadsworth Bridge, via Shepherd's Bush and Acton, to North Finchley; from Stratford Broadway to Ilford Broadway, and from Greengrate Street to Barking Broadway. On part of the first of the routes covered in the new orders there are tramways, and the restriction applies only to the tramway part. None but independent buses run on the route, so that the L. G. O. Company has no direct interest in the matter. The reduction imposed is from a nine-minute service to a half-hour service. On the second of these routes, on East End Avenue, the reduction is from a five-minute to a six-minute service. On the third route, also on East End Avenue, the reduction is one of 25 per cent.

Detailed schedules have been issued showing the number of bus trips each way per day on each route allowed to each bus owner. These vary from as high as 40 per hour in one case, allowed to the London General Omnibus Company, down to a minimum of one per day in the case of the smallest owners. Ultimately it is planned to take off 600 or 700 of the 5,400 buses now in operation in London. The reduction will cover a period of about two years.

Tramway Developments Proposed for Rosario.—Plans for the extension of the municipal tramways of Rosario, Argentina, has caused considerable interest in outlying districts that have no convenient means of transportation. It is the plan to construct and operate combined freight and passenger motor cars between the suburbs and the city over the principal thoroughfares. New lines aggregating about 252 km. are also planned. The cost of the work has been estimated at $2,950,000.

Swedish Electrification Nearing Completion.—Electric service on the Hallsberg-Falkoping line of the Swedish State Railways will be begun in the near future. This line is a branch of the Stockholm-Goteborg line. The electrification work is virtually completed. Work was begun in the summer of 1923. The cost has been reduced from an estimate of 105,000,000 crowns to some 39,000,000 crowns because of the speed made in construction.

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Recent Bus Developments

Arrow Buses Pass to Public Service

Important accessions continue to be made by the Public Service Transportation Company, Newark, N. J., affiliated with the Public Service Railway. The Transportation company has purchased the Arrow Bus Company, which operates lines between Newark and Paterson via Montclair, between Paterson and Midland Park and connecting Paterson and Ridgewood and Suffern.

The purchase was made from John H. Stoddard, Ridgewood, who owned the company, having developed it from a small enterprise operating two or three buses between Paterson and Upper Montclair. As part of the transaction Mr. Stoddard becomes associated with Public Service in an executive position.

Included in the purchase were 50 buses and 44 operating permits covering the three lines mentioned. Twenty-four of these permits are for service connecting Newark, Montclair and Paterson, two being used for local operation on Grove Street, Montclair; six permits are in use between Paterson and Midland Park and twelve connecting Paterson, Ridgewood and Suffern.

No changes are contemplated at present in the policy or method of operating the Arrow buses. It is intended to maintain an efficient service on all lines and to meet demands for increased facilities as they develop.

The purchase did not include Mr. Stoddard's interest in the Arrow Bus Inter-State Company, a separate corporation, of which he is president. The latter company operates interstate buses between Ridgewood and New York, Paterson and New York and connecting Caldwell and Montclair and New York.

Bus Proposal for Des Moines to Go Before Council

John Leveridge, president of the Capital City Motor Coach Company, announced on April 17 that he would ask the newly elected City Council for a permit to operate eight bus lines in Des Moines, Iowa. He said 33 coaches would be put in service within 60 days after the Council had approved his plan; that a 10-cent fare would be charged, and that the buses would not operate on railway lines.

Indications were, however, that the City Council which took office on April 5 will not grant any bus permit to a company which will compete with the Des Moines City Railway. Councilmen W. F. Mitchell and John Jenney are positive in their statements that they will oppose a competing bus system. Mayor Fred Hunter and Commissioners Frank Mathis and Mrs. C. H. Morris were noncommittal, but neutral observers expressed the belief that the bus promoters will meet with the same refusal received at the hands of the old Council.

M. H. Cohen, counsel for the bus company, said he did not know when the Council would be asked to consider the bus proposal. Those who know Mr. Cohen's business and political acumen believe that he will not offer any bus proposition if he finds a majority of the Council is hostile to such a move.

Meanwhile the Des Moines City Railway is going ahead with plans to institute two new crosstown bus lines in West Des Moines and expects to have a fleet of modern coaches in operation on the new lines inside of 30 days.

Fares Advanced in Louisville

On account of a 5-cent-a-gallon state tax on gasoline and higher prices of tires, the Kentucky Carriers, Inc., the bus operating division of the Louisville Railway, Louisville, Ky., increased its fare from 10 cents to 12½ cents on tickets, or 15 cents cash, on April 15. The old fare of 10 cents had been in effect since June, 1923, when the service was started. During that time operation showed a deficit of $72,000. Since the first of the year the loss has averaged $2,500 a month. About 4,000 passengers are carried daily. Four tickets are now being sold for 50 cents.

Two New Bus Lines for Buffalo

Franchises have been granted by the City Council to the International Bus Corporation, a subsidiary of the International Railway, for the operation of buses on two new lines in Buffalo, N. Y., but demand has been made for a referendum under the city charter to test the sentiment of voters toward the permits. The new lines would operate in Richmond Avenue, replacing the Hoyt Street car line and a crosstown route in Best and North Streets replacing the Best and the Connecticut Street car lines.

Three of the five members of the City Council voted to grant the franchises despite opposition at the hearing. No provision is made in the franchises for taxes and there is no provision for levying a special franchise tax by the State Tax Commission at Albany. A 10-cent fare will be charged with free transfers. The franchise will run for ten years. Application now will be made by the bus company for approval of the grants from the Public Service Commission.

Amendment to Railroad Law Lost

The Assembly of New York on April 20 defeated the Truman bill which had previously passed the Senate. It was intended by this measure to amend the railroad law by providing that a railroad corporation upon obtaining the approval of the Public Service Commission and the consents of local authorities could acquire, own and operate motor vehicles for hire for the purpose of carrying persons and property upon the highways of the state and receive compensation therefor. As it is now the railway must resort to the device of organizing subsidiaries which engage in the bus business in their interest.

Railway's Proposal Favored in Westchester

Representatives of twelve town boards of Westchester County, meeting at White Plains, N. Y., on April 21 agreed to approve the application of the County Transportation Company for the operation of a country-wide bus system. Nine of the communities affected voted for the County Transportation Company and only two for the Westchester Motor Transfer Company, the only other applicant. One representative did not vote. All had previously agreed to abide by the vote of the majority.

Leverett S. Miller, president of the County Transportation Company, will appear before the boards of the various municipalities to obtain consent for the lines, which, it was said, will be operated on a ten-year franchise.

Mr. Miller is president of the New York, Westchester & Boston Railroad, a subsidiary of the New Haven, which will own the County Transportation Company. He is also receiver for the Westchester Railway and the New York & Stamford Railway, which, it was said, will be abandoned if the County Transportation Company operates.

In Ossining, where trolley cars have been operated for many years, buses operated by the Westchester Coach Company took over the service on April 21. The trolley franchise and property were purchased by the bus company about a month ago. This company also operates bus service from Pleasantville to Ossining and is planning an extension of service from Briarcliff Manor to Scarborough railroad station. Instead of two routes being covered, as by the trolley system, an extensive route covering all of Ossining has been installed by the bus company.

The Westchester Motor Transport Company, the County Transportation Company, of which Mr. Miller is the head; the Westchester Bus Company, the Third Avenue Railroad, the International Bus Company, and a score of independent operators are seeking franchises to operate through Westchester. The five companies named desire county-wide systems and the independents desire short lines between municipalities.

Equal Number of Buses and Cars in Akron.—The Northern Ohio Power & Light Company, Akron, Ohio, will shortly begin the operation of through east and west and north and south express bus lines at a 10-cent fare. The company is now operating an equal number of cars and buses.

Abandonment of Bus Line Sought.—In the first 27 days that the Indiana Motor Transit Company, a subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company, operated a bus line between Indianapolis and Crawfordsville the gross earnings were $124 and the net loss was $508, according to evidence given the Public Service Commission in an effort to abandon the line. An unusual aspect of the case is that the company bought the line late in February from the Indiana Red Ball Lines, Inc., successor to Hiner's Red Ball Lines, Inc. No one opposed the request for abandonment.

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Franchise for Norwood Operation Allowed.—A franchise to operate buses to and through the city of Norwood, Ohio, has been granted the Cincinnati Street Railway by the Norwood City Council. The franchise provides for a $50 license fee for each bus and supervision of the equipment.

Extension of Bus Lines Desired.—Application has been made to the village board of Kenmore, N. Y., by the International Bus Corporation, Buffalo, a subsidiary of the International Railway, for permission to extend the Delaware Avenue double-deck bus line from the Buffalo city line to the north village line of Kenmore, a distance of about 2 miles. The company would charge 25 cents for round-trip tickets from Kenmore to any point in Buffalo. The fare inside the city of Buffalo is 10 cents. Favorable action on the franchise will be taken by the Kenmore village board. The company plans to discontinue the Delaware Avenue car line through the village of Kenmore if the necessary consent is obtained.

Must Exchange Transfers with Bus Company.—The Appleyard Motor Company, Burlington, Vt., has been granted permission by the Public Service Commission to operate additional bus lines in the eastern and northern sections of the city. The Burlington Traction Company, which opposed the petition of the Appleyard company, has been ordered by the commission to exchange transfers with the bus company. The traction company will be allowed to charge a 10-cent fare when issuing transfers to the bus line instead of the regular 7-cent fare.

Permit Sought in Parkersburg.—The Monongahela Transport Company, a branch of the Monongahela West Penn Public Service Company, has applied to the State Road Commission of West Virginia to operate a bus line from Fifth Street in Parkersburg, W. Va., across the Little Kanawha River to Lubeck Avenue, Seventh Street, Fifth Avenue, Wood Street and thence to Elizabeth. A hearing on the plea will be held on April 27 before the commission in Charleston, at which the request may be granted.

Tri-State Regulatory Bill Reported.—The interstate commerce committee of the United States Senate on April 21 favorably reported the bill to regulate bus traffic over the Philadelphia-Camden Bridge and the New York-New Jersey tunnel by joint action of the affected public utilities commissions. In the discussion on the matter Senator Cummins raised a question about the constitutionality of the proposed regulation, but Senator Edge of New Jersey said the situation was one in which an experiment was necessary.

Transfer of Bus Certificates Ordered.—The Alexandria & Suburban Motor Vehicle Company, owned by the Washington-Virginia Electric Railway, has been authorized by the Virginia Corporation Commission to transfer its passenger bus certificates connecting Alexandria, Potomac Yard and Virginia Theological Seminary and between Alexandria and Washington to R. L. May of Alexandria. Mr. May has been competing with the Alexandria & Suburban Motor Vehicle Company.

Financial and Corporate

New Company Takes Over Lake Shore's Power Properties

Interests identified with the Lake Shore Electric Railway, Cleveland, have organized the Lake Erie Power & Light Company to take over the light and power business of the railway, which operates between Cleveland and Toledo, Ohio.

Properties of the Bellevue Illuminating & Power Company, Bellevue Light & Power Company, and the People's Light & Power Company have been acquired by the new company.

Immediate construction is planned of a new 33,000-volt line feeding the Fremont and Woodville districts of northern Ohio. Further developments paralleling Lake Erie and reaching almost across Ohio are contemplated by the new interests.

The Lake Erie Power & Light Company is capitalized as follows:

$10,000,000 of first mortgage bonds authorized, $500,000 issued and outstanding.
$1,000,000 of first preferred stock authorized, $100,000 issued and outstanding.
$100,000 of second preferred authorized, all issued and outstanding, and 5,000 shares of no par common stock authorized, 4,650 shares issued and outstanding.

At a recent meeting of the railroad, Charles S. Thrasher, president of the Youngstown & Ohio River Railroad, was elected vice-president in charge of operation, and M. Ackerman, formerly of the Cincinnati & Dayton Electric, was made general manager. Joseph P. Harris, vice-president of the Union Trust Company, was made chairman of the executive committee. Mr. Ackerman's appointment has been referred to before in the JOURNAL.

Officers of the Lake Erie company are: Charles S. Thrasher, president; J. P. Harris, vice-president, and M. Ackerman, secretary and treasurer. Directors include, E. W. Moore, chairman; J. P. Harris, C. S. Thrasher, M. Ackerman, I. Freiberger, J. A. House and A. Lewenthal.

Augusta-Aiken Company Domesticated in Georgia

Explanation has been furnished of the plan to domicile the Augusta-Aiken Railway & Electric Corporation in Georgia, reference to which was made in ELECTRIC RAILWAY JOURNAL of April 17, page 694. The corporation is still a South Carolina corporation, and there has been no transfer of its charter. The company has merely become domesticated in Georgia, so that its operations may have the some benefits and privileges and be subject to the same obligations and responsibilities that attach to a domestic corporation in Georgia. This action was necessary because of the expansion program which the company is now prosecuting both in South Carolina and in Georgia. Through the Carolina Light & Power Company operating in Aiken and vicinity the resources of the Augusta Company are now available in the western section of South Carolina, the company having completed lines as far as McCormick in one direction and to Williston in another. Likewise, in Georgia power lines are being extended in a radius of 50 miles from Augusta, and it was in the interest of this development that the company deemed it advisable to domesticate in Georgia. This so-called act of domestication changes in no wise the fact that the corporation is a South Carolina corporation, and it will continue to operate under its South Carolina charter, taken out in 1906.

Additional Capital for Joplin & Pittsburg Railway

A plan is under way to rehabilitate the Joplin & Pittsburg Railway, Joplin, Mo., by using additional capital. The committee of first mortgage bondholders authorized M. H. McLean, a member of the committee and receiver of the railway, to make a thorough investigation. This would take up the feasibility and advisability of reorganizing and securing funds for the rehabilitation of the railway. Mr. McLean engaged Buchanan & Layng, New York, to make the investigation. During the period of this survey the same firm has been appointed to manage the property, vice Bruce Cameron, resigned. Mr. McLean stated that Mr. Cameron had operated the property under very difficult circumstances and that his services had been much appreciated.

Savannah and El Paso Properties Pass to Engineers Public Service

C. W. Kellogg, president of the Engineers Public Service Company, has announced that the plan for acquisition of the Savannah Electric & Power Company had become effective through the deposit of 95 per cent of the common stock of the latter company. The acquired company does an exclusive electric light, power and traction business in Savannah and its suburbs.

The Engineers Public Service Company has also completed the acquisition of the El Paso Electric Company, El Paso, Tex., through exchange of Engineers securities for purchase of the common stock of the El Paso company. Mr. Kellogg says that 75 per cent of the stock of the El Paso company is now owned by Engineers or has been deposited under the plan and agreement for acquisition of this stock.

The Engineers Public Service Company was organized under Delaware laws in June, 1925, to acquire directly or through subsidiaries public utility properties by purchase or through stock ownership. It owns practically the entire common stock of Virginia Electric & Power Company, more than 94 per cent of the common of the Eastern Texas Electric Company and all the common stock of the Key West Electric Company.

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Delaware & Hudson Reports Traction Earnings

Operating revenues of the United Traction Company, Albany, N. Y., from all sources during 1925 was $3,090,619, operating expenses $2,429,675 and taxes $203,550. Operating income was $457,394, compared with $129,608 in 1924, an increase of $327,785. Operating revenues decreased $115,238, or 4 per cent, as compared with the preceding year. Operating expenses decreased $309,733, or 11 per cent, and taxes decreased $133,290, or 40 per cent.

Among the items of decreased operating expenses were: Injuries and damages, $43,491; paving, $25,600; transportation expenses, $23,122; power purchased, $7,494; equipment retirements, $143,539; maintenance of structures, $8,383; maintenance of power and line, $9,036; track and roadway labor, $21,231; track and roadway material, $34,927; and maintenance of equipment, $11,904, but these decreases were partly offset by an increase of $18,834 in the cost of removing snow and ice.

The company's proportion of the cost of new pavement laid in 1925 was $65,353, of which $23,588 was chargeable to operating expenses and the balance to cost of property used in public service. Reconstruction of tracks, made necessary by the continuation of street paving programs, cost the company $50,218, requiring charges to operating expenses of $25,451. Anticipated improvements in streets traversed by the three electric lines that have been abandoned in favor of bus service would have cost approximately $230,000.

Operating revenues of the Hudson Valley Railway during 1925 were $833,925, operating expenses $818,465 and taxes $55,700. There was an operating deficit for the year of $40,240, comparable with a deficit of $120,390 in 1924. Operating revenues decreased $76,290, or 8 per cent, below the preceding year; operating expenses decreased $116,560, or 12 per cent, and taxes decreased $39,880, or 42 per cent. The Public Service Commission has approved this company's application for permission to abandon a portion of the Belt Line in Saratoga Springs, the Kaydeross Park Line and the interurban line between Ballston Spa and Mechanicsville. It was decided to close these operations in order to avoid inevitable and continued losses.

On May 1 the property of the Plattsburgh Traction Company was sold to a group of public-spirited citizens of Plattsburgh who desired to provide for the continuance of service in that city.

Operations of the Troy & New England Railway were discontinued on March 31 and the equipment salvaged. Negotiations are under way for disposing of the real estate.

The Capitol District Transportation Company, Inc., was incorporated in 1924 to operate trackless trolleys in the city of Cohoes and gasoline buses in the city of Rensselaer, supplementing the service of the traction companies. In 1925 the company obtained franchises to operate bus equipment on two routes in Albany and one in Troy. It is now operating four trackless trolleys in Cohoes, three gas-electric buses in Troy, two gasoline buses and one gas-electric bus in Rensselaer and eighteen gas-electric buses in Albany. Operating revenues during 1925 were $118,831, operating expenses $125,420 and taxes $1,005. There was an operating deficit of $7,594 for the year.

These facts are all contained in the report of the Delaware & Hudson Company, which operates the traction properties. No separate detailed statement of the earnings of the electric railways was contained in that report.

Tramway Receipts in Halifax Show Improvement

Following a period of several years of steadily decreasing income, the 1925 railway results of the Nova Scotia Tramways & Power Company, Ltd., Halifax, Nova Scotia, showed an improvement over those of the previous year, according to the ninth annual report to the shareholders. The number of passengers carried showed a slight decrease from 8,298,798 in 1924 to 8,043,803 in 1925. The service was kept up and the record shows a total of 1,616,684 car-miles operated, compared with 1,625,286 in 1924. The accident record in this department was again excellent, as the total expense was $4,352, or eight-tenths of 1 per cent of tramway receipts, "the lowest in the history of the company."

Auditor Says Detroit Municipal Is Sound Financially

Current assets of the Department of Street Railways at Detroit, Mich., are sufficient to meet current liabilities. In presenting the financial statement of the department for March, 1926, and the year ended March 31, 1926, William M. Hauser, auditor, stated that at last the department is sound financially. Mr. Hauser stated that "the need of additional equipment, coaches and cars and other improvements is urgent, and funds will have to be made available for these needs."

RESOURCES AND FUNDS PROVIDED	
Construction bonds voted April 5, 1920	$15,000,000
Purchase bonds voted April 17, 1922	4,000,000
Detroit United Railway obligation voted April 17, 1922	17,080,000
Additions and betterment bonds voted April 2, 1923	5,000,000
Deposits for land sales	362,863
Balance of earnings for the period from Feb. 1, 1921, to March 31, 1926 (after the payment of (a) operating expenses, (b) taxes, (c) interest, etc., (d) sinking funds	4,260,735
Total resources and funds provided	$45,703,599
DISBURSEMENTS	
For road and equipment	$44,407,812
For cash—working funds	114,600
For material and supplies	1,131,573
Total disbursements	$45,653,986
Resources and funds provided in excess of disbursements for capital cos's, or amount at March 31, 1926, available for future capital costs	$ 49,613

The balance of net income for March, 1926, is $65,272 after the payment of sinking fund charges. This compares with $65,045 for March, 1925.

During March, 1926, 45,403,194 passengers were carried by the rail lines and 1,721,319 by the coach lines, a total of 47,124,513 passengers, compared with 42,006,905 in March, 1925, divided 41,501,339 rail lines and 505,566 coach lines. In other words, the Municipal Railway carried 5,117,608 or 12.2 per cent more passengers in March, 1926, than in March, 1925.

The position of the Department of Street Railways as of March 31, 1926, with respect to capital costs is shown in the accompanying statement.

The amount of $49,613 also represents the excess of current and working assets over current and working liabilities.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	April 1926 **7.36**	March 1926 **7.36**	April 1925 **7.26**	March 1926 **7.36**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	April 1926 **154.2**	March 1926 **156.4**	April 1925 **157.3**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	April 1926 **224.7**	March 1926 **224.1**	April 1925 **221.6**	Sept. 1920 **232.0**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	April 1926 **201.3**	March 1926 **202.0**	April 1925 **204.1**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	April 1926 **207.0**	March 1926 **207.6**	April 1925 **209.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	March 1926 **151.5**	Feb. 1926 **155.0**	March 1925 **161.0**	May 1920 **246.7**	Jan. 1922 **138.3**

Conspectus of Indexes for April 1926

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Bradstreet Wholesale Commodities 1913 = 9.21	Apr. 1 1926 **13.11**	Mar. 1 1926 **13.40**	Apr. 1 1925 **13.69**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	March 1926 **159.9**	Feb. 1926 **161.5**	March 1925 **151.1**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	March 1926 **168.5**	Feb. 1926 **169.5**	March 1925 **165.3**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Mar. 31 1926 **4.380**	Feb. 28 1926 **4.617**	Mar. 31 1925 **4.863**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	March 1926 **19.50**	Feb. 1926 **16.58**	March 1925 **17.86**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number	March 1926 **1882**	Feb. 1926 **1700**	March 1925 **1654**	Jan. 1924 **2231**	Aug. 1925 **1353**
Liabilities (Millions)	**46.93**	**42.03**	**37.07**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. Previously the wage index applied to 144 railways. The change is due to dropping some roads where the number of trainmen has been reduced to less than 100.

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Deficit on Railway and Coach Lines of Beaver Valley Company

The gross earnings of the Beaver Valley Traction Lines, New Brighton, Pa., for the year ended Dec. 31, 1925, were $614,344, a decrease of $24,204 over 1924, while total operating expenses of $470,106 decreased $6,728, although there was an increase in taxes of $3,481. The final result showed a net deficit of $7,883 compared with a surplus in 1924 of $8,153. The deficit for 1925 was brought about entirely by the Pittsburgh & Beaver Street Railway, which had a loss of $24,141, occasioned by the unusual conditions in Ambridge and Leetsdale boroughs. These facts were brought out in the annual statement of the company, which stressed the fact that the industrial districts served by the Beaver Valley Traction Lines did not enjoy improved conditions in 1925 to the same extent that existed in many other sections. This resulted in unfavorable operating results for the traction lines during the year. The report goes into detail on the paving situation affecting the boroughs of Leetsdale and Ambridge.

It also includes statistics and comments on operation by the Beaver Valley Motor Coach Company, a subsidiary of the railway. This company did not increase its operation during the year except to extend the Sewickley to Leetsdale route into Ambridge by reason of the discontinuance of railway service through the borough of Leetsdale on Oct. 1, 1925. The operations for the year with gross earnings of $86,872 resulted in a net deficit of $1,200, compared with the deficit for the six months of the previous year, when the routes were becoming established, of $7,092. The deficit was to be expected by reason of the difficulties encountered in the matter of delays incident to road building work, with traffic moving in one direction only at one time and a very rough paving surface with higher maintenance cost. The accompanying tables show the income and profit and loss on the traction lines and the income for the year on the motor coach lines.

Confirmation of St. Louis Sale Expected Soon

Judge Kimbrough Stone is expected to render his decision within a few days in regard to the confirmation of the sale of the property of the Kansas City Railways under foreclosure. The hearing at which the recent depositions were considered was held on April 19. Confirmation of the sale is being protested principally by Blatchford Downing, attorney for the holders of the second mortgage bonds. One of his contentions is that business dealings between the agents or the reorganization committee and the attorneys for damage suit claimants formed a conspiracy detrimental to the interests of the holders of the second mortgage bonds. Mr. Downing contended that the provisions of the reorganization would make it easy to turn over a controlling interest to a holding company.

J. K. Newman, who helped to arrange the terms of the reorganization, is said to have stated that this was a possibility, but only a wild dream at present. He declared it would suit him to have Kansas City people acquire a majority of the common stock. Mr. Newman is said to have estimated that an additional $500,000 a year could be saved in operating economies if the city were to grant a service-at-cost franchise to the railway reasonable in its provisions with respect to the taxes and paving charges.

SUMMARY OF CONSOLIDATED INCOME AND PROFIT AND LOSS FOR THE YEAR ENDED DEC. 31, 1925, BEAVER VALLEY TRACTION COMPANY AND PITTSBURGH & BEAVER STREET RAILWAY
(With Transactions Between Companies Eliminated)

Gross revenue from street railway operations		$614,344
Operating Expenses:		
Maintenance of way and structures	$59,581	
Maintenance of equipment	43,211	
Traffic	7,667	
Power	69,288	
Transportation	154,558	
General administrative	57,244	
Other general	52,226	
Depreciation	14,130	
Taxes	12,198	
Total		470,106
Net revenue from street railway operations		$144,237
Auxiliary operations:		
Operating revenues	$11,098	
Operating expenses	4,230	
Net revenue from auxiliary operations		6,867
Total net revenue from operations		$151,105
Non-operating revenues:		
Rental of real estate and buildings	$1,762	
Interest and discount	106	
Miscellaneous	165	
Total	$2,035	
Non-operating expenses	166	
Net revenue from other operations		1,868
Gross income		$152,974
Income charges:		
Rent of leased properties	$4,500	
Interest on funded debt	119,100	
Interest on unfunded debt	35,952	
Ammortization of debt discount and expense	1,304	
Total		160,856
Net deficit for the year		$7,882
Deficit, Jan. 1, 1925		437,447
Miscellaneous debits (net)		36,968
Deficit, Dec. 31, 1925—per balance sheet		$482,298

STATISTICS

Miles of road	25.47
Miles of track	42.11
Cars—passenger	42
Cars—miscellaneous	7
Total cars	49
Car-miles operated	1,521,238
Passengers carried—revenue	11,589,454
Passengers carried—transfer	436,480
Passengers carried—total	12,034,023
Earnings per car-mile—cents	40.38
Earnings per passenger carried—cents	5.1

SUMMARY OF INCOME AND PROFIT AND LOSS FOR THE YEAR ENDED DEC. 31, 1925, BEAVER VALLEY MOTOR COACH COMPANY

Gross revenue from operations		$86,871
Operating expenses:		
Maintenance of equipment	$14,606	
Traffic	465	
Transportation	63,000	
General and miscellaneous	3,599	
Depreciation	4,970	
Taxes	847	
Total		87,491
Deficit from operations		$619
Income charges—interest on unfunded debt		580
Deficit for the year		$1,199
Deficit, Jan. 1, 1925	$7,091	
Deficit credits—miscellaneous (net)	806	
Total		6,285
Deficit, Dec. 31, 1925—per balance sheet		$7,484

STATISTICS

Routes operated	3
Coaches owned	8
Coach-miles operated	265,138
Coach-hours operated	36,638
Passengers carried	859,105
Earnings per coach-mile—cents	32.8

Decline in Riding.—Report of the Community Traction Company, Toledo, Ohio, for March shows a slight decline in riding compared with the previous year and a net deficit of $1,705 for the month. Revenue for March was $320,320, compared with $325,511 for March, 1925. Passenger revenue declined about $1,200, but the number of revenue pasengers declined from 4,406,220 to 4,385,990 in March this year. The loss was in spite of improved service indicated by 19,934 additional car-miles of operation. Considerable economy has been effected, however, bringing operating expense down to $227,430, which shows reduction in car mileage costs from 39.640 to 38.623 cents. One-man cars account for a large part of the saving. An account of the negotiations looking toward a modification of the terms of the Milner ordinance, under which the company operates, appears elsewhere in this issue.

Cincinnati Purchase Effected. — The last link in the chain to bring about a unified electric railway system in Cincinnati, Ohio, was completed recently, when the Ohio Public Utilities Commission authorized the Cincinnati Street Railway to purchase the Cincinnati & Hamilton Traction Company for $1,000,000. Authority for the purchase was obtained by the railway from the city of Cincinnati several months ago. To finance the purchase the railway will issue 20,000 shares of no par common stock. The Cincinnati & Hamilton Traction Company, which has been a non-operating company for years, owns the railway from the Cincinnati Zoological Gardens, through the Millcreek Valley to Hamilton, Ohio, a distance of 20 miles. Part of the line will be abandoned by the railway.

United Makes Claim on Easements.—The United Railways & Electric Company, Baltimore, has answered a petition which was filed in court recently by Clarence W. Miles, people's counsel, in which Mr. Miles seeks to have the courts rule against including easements in the valuation of the company's property. The Maryland Public Service Commission recently fixed a valuation of $77,000,000 on the property of the company, $7,000,000 of which was allowed for easements. Mr. Miles made a hard fight against including easements, but the Attorney-General of the state ruled that the commission should include them. When this action was taken Mr. Miles appealed to the court and answers to his petition have been filed by both the United and the Public Service Commission. In addition to making a claim that the easements should be included in the valuation, the United also makes a plea that the $70,000,000 allowed by the commission for physical valuation and the $7,000,000 for easements be increased.

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Personal Items

Purchases Centralized by Insull Railways

Edward E. Kretschmer Appointed to Head New Department for Roads at Chicago

A centralized purchasing department has been organized for the four electrically operated transportation systems under the management of Samuel Insull and associates, serving the Chicago Metropolitan district and adjoining territory. These associated railroads are the Chicago Rapid Transit Company, the Chicago, North Shore & Milwaukee Railroad, the Chicago, South Shore & South Bend Railroad and the Chicago, Aurora & Elgin Railroad.

E. E. Kretschmer

Edward E. Kretschmer has been appointed director of purchases in charge of the centralized office, with general supervision of stores and commissary for the four companies.

Mr. Kretschmer is a native of Chicago. He entered the employ of the General Electric Company as an office boy in 1893 and was transferred to the engineering department in 1895, where he remained until March, 1903. He studied electrical engineering and was a studient at Lewis Institute, Chicago, for three years. He entered the employ of the Northwestern and the Lake Street Elevated Railroads in March, 1903, as chief clerk to the general superintendent. There Mr. Kretschmer gave such an excellent account of himself that he was appointed purchasing agent at the time of the consolidation of all the elevated lines in September, 1911. He was serving the Chicago Rapid Transit Company in this capacity at the time of his new appointment, April 1. His successor is W. J. Boucher.

Full direction and authority over purchasing and commissary for the four companies and the stores department of the Rapid Transit Lines are vested in the centralized department, which also has supervision and control over the methods and routines to be adopted uniformly by the several storekeeping departments of the railroads.

Appointments announced by Mr. Kretschmer in organization of the new department are:

P. F. McCall to be manager of commissary for the Chicago, North Shore & Milwaukee Railroad, Chicago, South Shore & South Bend Railroad and Chicago, Aurora & Elgin Railroad.

Roy R. House to be general supervisor of railway stores for the four companies included in the centralized purchasing department.

H. S. Sweet Resigns from New York State Properties

Harrison S. Sweet, assistant general superintendent of equipment of the New York State Railways, for the Rochester, Syracuse and Utica lines, has resigned to accept a position as factory manager for the Mohawk Asbestos Plate Company at Oneida, N. Y. Thirteen years ago Mr. Sweet joined the personnel of the New York State Railways as draftsman. He was advanced to assistant master mechanic in 1917. This position he held for a few years, when he was made engineer of equipment. In this work he was associated with J. F. Uffert, superintendent of equipment, in supervising the maintenance of the railway's rolling stock. His duties consisted largely of the standardization of parts and car equipment and of other engineering work in connection with the equipment and shops. After holding this position for about three years, he was again advanced, this time to the office of assistant general superintendent of equipment. While he was engaged in this work Mr. Sweet developed a form of automatic safety brake equipment intended for cars operated by one man.

He was graduated from Bucknell University in 1912 as an electrical engineer. Subsequently he spent about a year with the General Electric Company in laboratory and test work.

F. T. Hulswit Out of Other Utilities

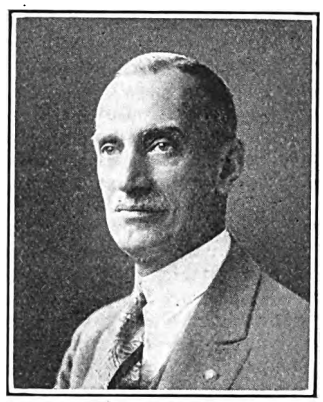
Frank T. Hulswit, who resigned recently as president of the United Light & Power Company, Chicago, has resigned from the board of the American Superpower Corporation. Mr. Hulswit also had resigned from the presidency of the Brooklyn Borough Gas Company and from the boards of other utilities controlled by the United Light & Power Company. He has retained his controlling interest in the American States Securities Corporation, which he organized in December for general investment purposes.

E. J. Sardeson, who has been cashier in the auditor's department of the Buffalo & Erie Railway at Fredonia, N. Y., has been promoted to traffic manager. Mr. Sardeson's special duties will be with the freight department, in which the business is increasing rapidly.

W. H. Shepherd a Division Manager of the Public Service Railway

Not so long ago men in electric railway work who were proud of continuous service records were warned by the ELECTRIC RAILWAY JOURNAL to look to their laurels, because a certain William H. Shepherd, Jersey City, had been attracting attention by his record of service and his performance in service. He had been made assistant to the general superintendent of the Public Service Railway though he started humbly in 1891 as a conductor in Jersey City on the Erie Street horse car line. Today that same William H. Shepherd is division manager of the Hudson Division of the Public Service Railway. As such he is now in charge of all lines in Hudson County. In this capacity he succeeds Milton G. Stratton, who has resigned.

Mr. Shepherd has filled every position in the company's service below his



W. H. Shepherd

present one, among them being those of starter, inspector, general office clerk, time-table clerk, and thence through the time-table department to assistant superintendent. Just how hard Mr. Shepherd has worked was made the subject for comment in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 20, 1926, page 345, but it appears that he has not been altogether devoted to work. "Pop," as he is familiarly known, organized the Public Service Railway Athletic Association and has been active in promoting track and field sports as well as pool tournaments. Mr. Shepherd is liked by the men, too. Evidence of this is seen in the fact that he was selected the most popular railway man in 1915 and won first prize—a trip to the San Francisco Exposition with all expenses paid.

W. J. Bertke Heads Iowa Association

W. J. Bertke, president of the Sioux City Gas & Electric Company, Sioux City, Iowa, was elected president of the Iowa Electric Railway Association at the annual business meeting on April 8, in Des Moines. The railway executives met in joint convention with the Middle West Division of the National Electric Light Association and the

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Iowa Section of the association. Mr. Bertke succeeds F. C. Chambers, president of the Des Moines City Railway, as head of the railway section.

The new president of the Iowa Electric Railway Association has been identified with various properties controlled by the United Gas Improvement Company since he was graduated from the University of Wisconsin in 1903. At that time he enrolled in the cadet course being conducted by that company on its property in Sioux City. After two years in this course he was transferred to the Wyandotte County Gas Company in Kansas, as assistant superintendent, and two years later he returned to Sioux City as superintendent of production. About a year later he was transferred to the distribution end of the business and two years later he took charge of both production and distribution. Mr. Bertke became assistant general manager of the Sioux City Gas & Electric Company in 1917, and held this position until 1923, when he was promoted to the position of vice-president and general manager.

New Commission Members in New York

J. F. Gilchrist Made Chairman—L. C. Godley and C. C. Lockwood Are New Members—Transit Commission Becomes a Bureau of New Public Service Department

GOVERNOR SMITH on April 20 appointed John F. Gilchrist, present chairman of the State Tax Commission, to succeed George McAneny as chairman of the New York Transit Commission, whose term expired on April 16. Mr. Gilchrist is appointed for the long term of nine years. The other new members of the commission will be Leon G. Godley of Brooklyn, who is to serve for six years, and former State Senator Charles C. Lockwood of Brooklyn, who is appointed for three years. Mr. Lockwood is the Republican member. The appointments of Mr. Gilchrist and of Mr. Lockwood immediately were confirmed by the Senate, on motion of Senator Knight. The appointment of Mr. Godley was referred to the committee on finance as a necessary part of Senate procedure.

The two retiring members of the Transit Commission in addition to Mr. McAneny are Gen. John F. O'Ryan and LeRoy T. Harkness. They went out of office recently with the expiration of the old transit law. Governor Smith has since signed the bill, recreating the transit commission.

Under the reorganization of the state government as provided for in the Hughes plan the Transit Commission will become a bureau within the new Public Service Department. It will have regulatory functions, similar to the Public Service Department proper, but will be confined in its jurisdiction to transit in New York City. The Democrats attempted, despite the Hughes report, to abolish the Transit Commission entirely and to transfer its functions to the Board of Transportation in New York.

Mr. Gilchrist was born in New York City on Oct. 12, 1873. He was educated in the public schools and a business college. He worked for the Thomas J. Pope Sons' Company, metal dealers, until 1897, and then went into the insurance business, where he remained until he was appointed Under Sheriff of New York County in 1908 by Sheriff Julius Harburger. Mr. Gilchrist, like Governor Smith, was a protégé and friend of the late Thomas F. Foley, Tammany leader, and for many years was secretary of Mr. Foley's district organization, the Downtown Tammany Club. When Mr. Smith was elected Sheriff, he retained Mr. Gilchrist as Under-Sheriff and the latter served another term in that office under Governor Smith's successor. At the beginning of the Hylan administration Mr. Gilchrist was appointed Commissioner of Licenses and later became a member of the Board of Purchase. On Jan. 9, 1923, Governor Smith named him as a member of the State Tax Commission for a term ending Dec. 31, 1928, and a few weeks later appointed him president to succeed Walter W. Law, removed on charges.

Mr. Godley is a lawyer. He was born in Corning, N. Y., and has lived in New York City for 25 years. He is a graduate of St. Lawrence University at Canton, N. Y., and the Brooklyn Law School. Mr. Godley had been an assistant corporation counsel for three years when he was appointed in January, 1914, a Deputy Police Commissioner in the Mitchel administration. He was in charge of police work in Brooklyn and conducted many of the police trials. Mr. Godley studied law in the office of the late Edward M. Shepard and for a time was Mr. Shepard's secretary.

Mr. Lockwood, like Mr. Gilchrist, is a native New Yorker. He was born in Brooklyn in 1877. He was educated in the public schools and the New York Law School. He was elected to the Assembly in 1913 and to the State Senate in 1914, 1916, 1918 and 1920. During his last term as Senator he was chairman of the joint legislative committee on housing, which conducted an investigation, with Samuel Untermyer as counsel, and recommended many bills to correct the conditions disclosed, most of which became laws. In 1921 Mr. Lockwood was the anti-Tammany candidate for Comptroller on the "coalition" ticket. He has been active for years in Brooklyn Republican politics and is now chairman of the Kings County Republican committee.

Public Relations Department Under Janet Converse

The public relations department of the Los Angeles Railway, Los Angeles, Cal., has been reorganized and materially expanded to include a Speakers' Bureau, Reference Bureau and Library. It has been placed under Janet Converse, who for several years was in charge of the Los Angeles office of the California Railroad Commission. For some time prior to that Miss Converse was identified with the Los Angeles *Express*. She has had an extensive experience in dealing with the public in matters pertaining to public utility regulation.

Paul Emile Mercier New Member of Montreal Commission

Paul Emile Mercier, well known engineer in eastern Canada, has been named by the provincial government to succeed the late Dr. L. A. Herdt as member of the Montreal Tramways Commission, Montreal, Canada. Dr. Herdt was vice-president of the commission, and will be succeeded in that position by J. S. Archibald, member of the commission since its inception, while Mr. Mercier becomes its third member. The commission was created by the tramways contract in 1918. This is the first change in its personnel. He was chairman for the Montreal Park & Island Railway in 1896; rodman and leveller for the Canadian Pacific Railway, 1897-1898; assistant engineer, Dominion Public Works, 1899; district engineer, Yukon territory, 1902; district engineer, Quebec, in 1904 and engineer in charge of the Canadian Northern Railway, 1907.

Mr. Mercier returned to private practice in 1914, and the year following became deputy chief engineer for the city of Montreal, the chief engineer being then Georges Janin, who died overseas during the war. In 1915, Mr. Mercier became chief engineer, and later on was director of public works at Montreal. In 1918 he became consulting engineer for the city, a position he has occupied since that time. Mr. Mercier, the author of many works, is a professor at the Polytechnique School, Montreal.

Mr. Mercier was born in 1877 at St. Hyacinthe. He studied at St. Mary's College, Montreal, and took up his engineering course at the Polytechnique School, Montreal. From this institution he was graduated with the degree of B.S.

"Jeff" Leaves the Los Angeles Railway

J. G. Jeffery, who has been head of the public relations department of the Los Angeles Railway, Los Angeles, Cal., since May 3, 1920, became assistant manager of the Los Angeles *Downtown Shopping News* on April 12.

One of Mr. Jeffery's jobs, and an important one, too, has been the task of editing *Two Bells*, a herald of good cheer and co-operation published by and for the employees of the Los Angeles Railway. Advisedly is the word "task" used in this connection. "Jeff," as he is known far and wide in Los Angeles, is not the type that ever lets a thing become a task. *Two Bells* proves this. No paper so well done as is this is ever a task to the hand that produces it. One can't remain genuinely jovial at a task. The two things are not consonant. And *Two Bells* has always been jovial.

Jeff has succeeded in covering up the biographical facts about himself, but no man doing the kind of work he has

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been doing can fail to write into the product that he turns out an index to what he really is and stands for.

His work ranks Jeff high. The very first sentence of his valedictory bespeaks the sense of proportion that he has preserved in all the work that he has done for the company. Of himself he says that he "was appointed office boy of the public relations department May 3, 1920, and on May 4 of the same year was made director of public relations."

To revert to the first paragraph of this account, the statement is made that Jeff will be assistant manager of *Downtown Shopping News*. That sounds prosaic. But nothing that Jeff ever tackles is likely to become prosaic to him. He is not built that way. He will control circumstance when he can, but when it is no longer possible for him to do that Jeff will make circumstance.

Appreciation has a big place in the heart of a man of this type. So it is not unexpected that he is found signing himself off in these words: "The editor wishes to thank the thousands who have offered sympathy, the hundreds who have offered advice, the dozens who have offered news and the one who offered a drink." There is craftsmanship even in this sentence, which, while it arranges the offers in the order of their preponderance, preserves the spirit of proper importance. A bright, particular star has passed out of the public relations firmament.

Herbert B. Flowers, president of the New Orleans Public Service Company, New Orleans, La., for the past three years, was elected president of the Southwestern Geographic Division of the National Electric Light Association, which met at Galveston, Tex., during the week ended April 17.

W. A. Jeffrey, assistant joint purchasing agent of the Memphis Power & Light Company and the Memphis Street Railway, Memphis, Tenn., has been elected president of the Memphis Association of Purchasing Agents. Mr. Jeffrey has been connected with the purchasing agent's office of the Memphis companies since Aug. 1, 1920.

Peter J. Drexelius has started work as assistant corporation counsel of the claims division of the Department of Street Railways, Detroit, Mich. For seven years he served as deputy county clerk. He is a graduate of the Detroit College of Law. The appointment was made by Charles P. O'Neil, corporation counsel.

Truman C. Curtiss has reconsidered his decision to withdraw as superintendent of transportation of the Chicago, Aurora & Elgin Railroad, Elgin, Ill., and will retain his position with the company, recently taken over by the Insull interests. Mr. Curtiss has been connected with the company eighteen years. He was made superintendent of transportation ten years ago after having been superintendent of the Aurora, Ill., city lines.

Mark Russell has been made manager of the Hutchinson Interurban Railway, Hutchinson, Kan. He succeeds J. M. Stoddard, who resigned recently. Mr. Russell entered the service of the Hutchinson company in 1916, and except for a short period during the war he has been with that property ever since. Beginning as a conductor, he transferred to the shops in 1918 and served as shop foreman, master mechanic and superintendent.

M. H. Frank Has New Honor as Head of Wisconsin Association

M. H. Frank, the new general manager of the Wisconsin Power & Light Company, Oshkosh, Wis., has been elected president of the Wisconsin Motor Coach Association. Mr. Frank has had wide experience in the railway field. He was first identified with the Lake Shore & Michigan Southern Railroad, part of the New York Central, at Elkhart, Ind. Later he served with the Fort Wayne Electric Works in Fort Wayne, and some time after this association became affiliated with the Indiana & Michigan Electric Company as assistant construction engineer, then as resident engineer. In 1913 he assumed

M. H. Frank

the position of assistant testing engineer for the Fargo Engineering Company in Jackson, Mich.

Always interested in changes which would broaden his experiences, Mr. Frank in June, 1916, entered the employ of the Galesburg Railway, Light & Power Company in Galesburg, Ill., and served with that company until April, 1918. Here he had direct charge of all construction work. He also managed the city railway and interurban systems along with his work of general operation covering the generation and distribution of electricity for light and power purposes. In that same year, 1918, he joined the forces of the Eastern Wisconsin Electric Company at Fond du Lac, now known as the Wisconsin Power & Light Company, as manager of the gas and electric end of the business. Four years later he became manager of the electric utilities of the Eastern Wisconsin Electric Company, supplying the city of Sheboygan. On Jan. 1, 1924, he assumed management of the electric railway lines as well. In that position he succeeded B. W. Arnold. Early in the present year Mr. Frank was promoted to general manager.

Mr. Frank was graduated from Purdue University in 1912 as an electrical engineer and in 1915 received an advance degree of electrical engineering.

Obituary

Prof. Louis Anthyme Herdt

Prof. Louis Anthyme Herdt, Macdonald professor of electrical engineering at McGill University and vice-chairman of the Montreal Tramways Commission, Montreal, Que., died on April 11. Professor Herdt was born in Trouville, France, in 1872. He was educated at McGill and in Belgium. He returned to Montreal and was at McGill University successively as demonstrator in electrical engineering, lecturer, assistant professor, associate professor and head of the department. Professor Herdt was president of the Electrical Service Commission of Montreal, a member of the Engineering Institute of Canada and a Fellow of the American Institute of Electrical Engineers. He was appointed in 1905 Officier d'Académie de France and Chevalier de la Légion d'Honneur in 1923.

F. J. Pryor

Frank J. Pryor, secretary-treasurer of the American Electric Power Company, Philadelphia, Pa., died on April 11. He was 59 years old.

Mr. Pryor was born in Pottsville, Pa., in 1866 and at the age of nineteen was graduated from the University of Pennsylvania in arts and sciences. As a young man he entered the service of the United States Customs Department in Philadelphia. He became identified with the American Electric Power Company about 30 years ago.

F. O. Bailey, manager of sales of the Gold Car Heating & Lighting Company, New York, died at his home in Brooklyn on April 14.

Williard Gilbert Carlton, superintendent of power, Electric Division and Grand Central Terminal, New York Central Lines, died recently in Yonkers. Prior to accepting the post he held with the railway in 1905 he was employed in the engineering department of the Commonwealth Edison Company in Chicago. Mr. Carlton was born in Warren, Ill., 58 years ago. He was graduated from the College of Engineering at Cornell University. Mr. Carlton went with the New York Central Railroad as superintendent of power for the Electric Division on Oct. 1, 1905, about a year previous to initial electrical operation. On Jan. 1, 1915, he was appointed superintendent of power, Grand Central Terminal, in addition to his other duties, which positions he held until his death. He was in charge of the operation of power stations, substations, transmission and distribution system, terminal service and boiler plants, and of the supply of heat, light and power to the buildings in the Grand Central Terminal.

John J. Walsh, station inspector on the southern division rapid transit lines of the Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., died recently. Before going to Brooklyn in 1899 he was employed as a conductor on the Scranton Railway, Scranton, Pa. He was trustee for the rapid transit lines from 1918 to 1923. Mr. Walsh was born in Danville, Pa., 50 years ago.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Merchants at New York Offer to Aid City

Representatives of eighteen of the largest civic associations in New York held a joint meeting on April 14 and adopted a resolution asking Mayor Walker to appoint a committee of citizens to advise him in transit matters.

The meeting also went on record in favor of the following principles: (1) That new subways should be built as rapidly as possible. (2) That "the ideal to be aimed at is unification of new and old lines so far as possible."

It was proposed that a third principle be indorsed to the effect that the associations represented were opposed to municipal operation of subways, but this was deferred as not a pressing question at this time.

L. R. Eastman, president of the association, said the purpose was to help the city authorities, not criticise or interfere with them.

Seattle Wants 80 Cars!

Seattle is in a quandary. It wants to purchase 80 cars for its Municipal Railway, but it does not want to pay for them; that is, on the terms it appears to be possible to arrange. It wants to pay for the cars with paper which it proposes to give to the car builders, but it objects to the terms of discount which might have to be imposed in a proceeding of this kind. The street railway department is without funds. It admits that. Still it wants the cars. As a matter of fact, D. W. Henderson, superintendent of the railway department, is persistent in his advocacy of their purchase. He does not purpose to be caught unawares.

Under Mr. Henderson's direction drawings for the cars are now being made. He says the new cars will weigh 31,000 lb. each, compared with 54,500 lb. for the old cars. The saving estimated by him on the new cars is placed at about $200,000 a year in labor, maintenance and power. It is Mr. Henderson's job to save wherever he can, for the Seattle Municipal Railway is doing none too well. The city books show that the street railway made a profit of $369,430 in 1924. The margin last year was $25,746. For the first two months of 1926 the system shows a loss of $12,103. That has its bearing on the probable purchase, but it is somewhat far removed from present considerations. The shrill voice of the opposition says "Buy buses." However, this apparently is not taken seriously. More disconcerting is the fact that the bond ordinance might be construed to be invalid under a provision of the state law which prohibits issuance of revenue utility bonds for replacements.

After all, Seattle is not really after more cars—it is after better cars. Better cars are a fetish with Mr. Henderson, who knows their pulling power. In city circles doubt seems to be pretty well dissipated that a way out will be found. Meanwhile, the question is being bandied about by the newspapers. The bond ordinance was enacted more than three months ago. It authorizes an issue of $1,875,000 of bonds for the purchase of 80 cars, the construction of a garage for the railway's buses and improvements to track and roadway.

Business Gains in April

Continued gains in business for the first two weeks of April over the same period of the previous year are seen from the latest weekly figures covering business conditions reported to the Department of Commerce. The volume of distribution, indicated by figures on carloadings and check payments, was larger than in any other comparable period. The output of bituminous coal and beehive coke during the first week of April was larger than a year ago, while lumber production and the volume of new building contracts awarded recorded similar changes from the corresponding week of 1925. The total value of building awards in 36 states during the first fourteen weeks of 1926 was about 25 per cent larger than during the same period of 1925.

Westinghouse Billings Rise

Billings of the Westinghouse Electric & Manufacturing Company for the quarter ended March 31 last, which closes the company's fiscal year, are estimated at $45,000,000, against $40,650,000 in the corresponding quarter of the preceding year. Billings for the nine months to Dec. 31, 1925, were $122,253,533. Indicated billings for the fiscal year ended March 31, 1926, are $167,000,000, comparing with $157,880,292 actually billed during the year ended March 31, 1925. The gain is equivalent to 6 per cent. Bookings for the fiscal year are estimated at $180,000,000, against actual bookings in the preceding year of $150,000,000, or a gain of 20 per cent.

Exhibit Plans Are Made

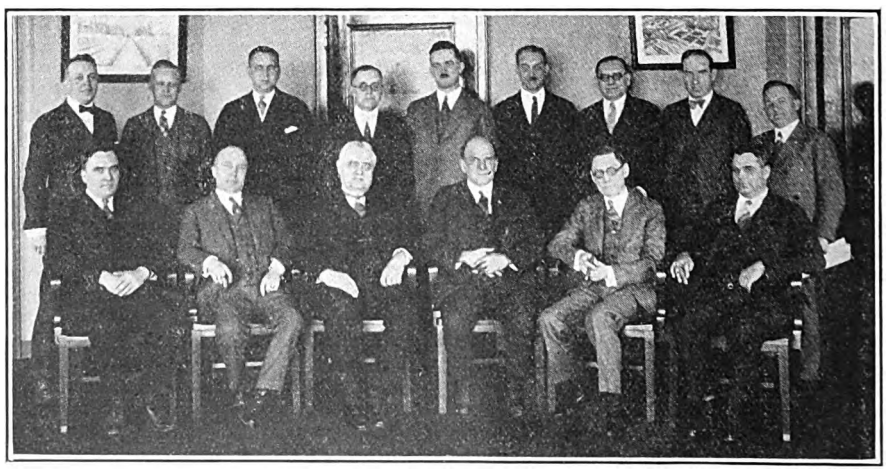
Committee Meets to Consider Policies for Cleveland Convention of A.E.R.A. —Facilities Good

Facilities for the installation and dismantling of exhibits at the annual convention of the American Electric Railway Association to be held in the public auditorium, Cleveland, Ohio, Oct. 4 to 8, will be exceptionally good. At a meeting of the exhibit committee of the association, held in Cleveland on April 15, the possibilities for exhibits of all kinds were discussed in detail.

Roy Frisbee, assistant manager of the auditorium, stated that several large and heavy exhibits have been held in the building, calling for handling of cumbersome materials. In no case has there been any exceptional difficulty experienced, nor has there been any shortage of adequate labor of any classification.

The committee voted its appreciation of the resolutions passed by the executive committee of the association in setting aside Wednesday, Oct. 6, for exhibit inspection and in barring hotel exhibits and demonstrations at any place other than that designated by the association. Contract with the Cleveland convention committee covering the use of exhibition buildings and facilities was read and approved. The contract is now ready for execution by the proper officers of the association.

Rules and regulations which will apply in connection with the coming exhibit are in course of preparation. It is planned to send these out on June 1 to all members, together with application blanks and diagrams. Fred Dell, who directs the exhibit, has written all manufacturer members, suggesting that they make their exhibit plans now. This will save inconvenience or possible disappointment later on when reservations are made.



Meeting of Exhibit Committee for A. E. R. A. Convention

Seated, left to right: Col. J. H. Alexander, chairman; S. J. Cotsworth, B. A. Hegeman, Jr., C. H. Clark, A. L. Price, L. W. Shugg. Standing, left to right: Fred C. J. Dell, director of exhibits; R. Roy Holden, C. P. Billings, J. R. McFarlin, A. M. Robinson, A. Frank Paul, A. L. Kippenberger, H. Fort Flowers, J. C. McQuiston.

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$300,000 Improvement Program in Syracuse

A $300,000 improvement program for this year in Syracuse, N. Y., has been announced by Benjamin E. Tilton, vice-president and general manager of the New York State Railways. The program includes addition of three new buses, with a capacity of 29 passengers each, and operation of a new express truck service between Syracuse and Rome. Four motor trucks will be purchased for this purpose. The largest item in the program is an expenditure of $85,000 for work in connection with the widening project at Onondaga and Salina Streets in the downtown section. Several smaller repaving projects are on the list. During the year the New York State Railways will install 3 miles of new overhead trolley wires and purchase considerable maintenance of way equipment.

American Locomotive and Railway Steel Spring Merge

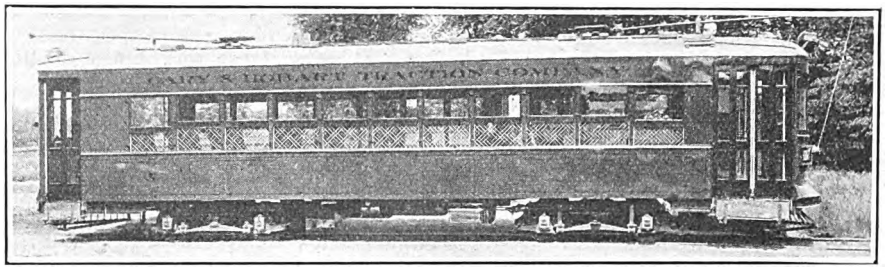
Merger of the American Locomotive Company and the Railway Steel Spring Company was approved on April 20, when the stockholders of the former concern voted to authorize a change in capitalization.

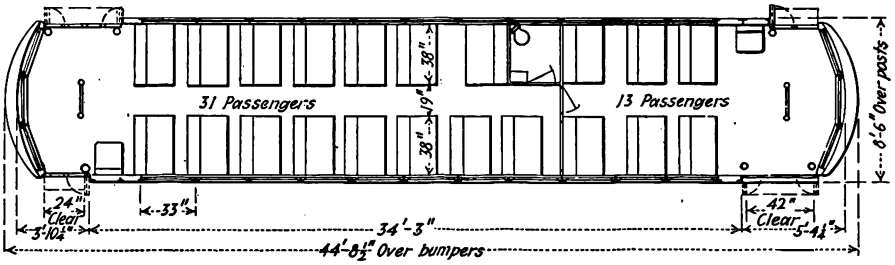
Foreman Training to Be Considered

Foreman training and the question of wages are two important subjects which will be discussed in an industrial group meeting to be held as a part of the fourteenth annual meeting of the Chamber of Commerce of the United States at Washington May 11 to 13. The program for this group meeting is being prepared by the department of manufacture of the national chamber, and leading industrialists in all parts of the country are to attend.

A. J. Brosseau, president Mack Trucks, Inc., New York, will preside at the meeting. Discussion will be opened by two outstanding figures in the manufacturing field. Following this there will be a general discussion of the subject for the purpose of giving those in attendance an opportunity to present their views. In announcing the preliminary program for the meeting, the chamber's department of manufacture says that the two subjects are among the most important industrial questions of today, calling for the concerted attention of manufacturers. It is evident that this latter category might well be expanded to include transportation agencies and all forms of industrial activity in which large bodies of men as employees are required. With regard to the question of foremanship training, the department says that restricted immigration, elimination of waste and lost motion, the need for restoring as far as possible the old-time relation between the employer and employee which obtained in the days of the small shop, are some of the reasons that industry is giving special attention to the selection and training of men occupying important supervisory positions at the lower end of the industrial ladder.

New Cars for Gary and Hobart





Three all-steel motor passenger cars have been built for the Gary & Hobart Traction Company, Hobart, Ind., by G. C. Kuhlman Car Company. They have a seating capacity of 44, accommodations for 31 passengers being provided in the regular passenger compartment and thirteen in the smoking compartment. Specifications follow:

Weight:	
Car body	20,700 lb.
Truck (with motors)	19,120 lb.
Equipment	2,700 lb.
Total	42,500 lb.
Bolster centers, length	21 ft. 1 in.
Length over all	44 ft. 8½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8¼ in.
Height, rail to trolley base	10 ft. 11¾ in.
Body	All steel
Interior trim	Mahogany
Headlining	Agasote
Roof	Arched
Air brakes	General Electric
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Statuary bronze
Center and side bearings	Brill
Compressors	CP. 27B
Control	G.E.K35 PP
Curtain fixtures	Rex all-metal rollers No. 63 brackets
Curtain material	Pantasote double-coated
Destination signs	Illinois, perforated dash sign
Door operating mechanism	National Pneumatic air and manual
Fenders	Steel pilot
Gears and pinions	Electrical Manufacturing, solid
Hand brakes	Peacock staffless
Heater equipment	Railway Utility 22, truss plank
Headlights	Golden Glow roof type HDB, 12 in. reflector
Lightning arresters	GE-MD
Motors	Four GE-2471, inside hung
Finish	Enamel
Registers	Ohmer
Sanders	Four Ohio Brass, air
Sash fixtures	Edwards lock and lift
Seats	Brill reversible
Seating material	Leather
Steptreads	Feralun
Trolley catchers	Ohio Brass
Trolley base	United States
Trucks	Brill 77-E-1
Ventilators	Nine N-L exhaust with grill
Wheels	26 in. diameter

Use of Oil Shows Rapid Increase —Coal Slower

World production of petroleum in 1925 was 1,065,220,000 bbl., a new high record and a total of 54,000,000 bbl. larger than that of 1924. The figures show that the competition of fuel oil, which is such a factor in the United States, is world-wide, and is the great underlying cause for the depression in the coal fields of Great Britain and on the Continent.

In 1925 the world production of coal was 1,368,000,000 tons, only 26,000,000 tons greater than in 1913. Prior to that time the average normal growth was 38,000,000 tons per year. Thus, in a twelve-year period, there has been less than one year's normal growth.

Haskelite Business Picks Up

One indication of the success which the new modernizing campaign is meeting is furnished by the volume of business placed recently for Haskelite and Plymetl, the light-weight body materials manufactured by the Haskelite Manufacturing Corporation, Chicago. Twenty-three different companies have ordered Haskelite or Plymetl or both for street railway cars and more than twenty are represented in the bus orders which are now under construction or have just been delivered. The latest car order is from the Chicago & Joliet Electric Railway for Haskelite to be used for roofs, headlinings, and inside linings on ten new interurban cars to be built by the Cummings Car & Coach Company.

Trolley Wire Output in 1925

On the basis of reports from nearly all the wire drawers of the United States in respect to their delivery of trolley wire, the American Bureau of Metal Statistics estimates the total manufacture of this kind of copper wire at 6,650 short tons in 1925, as compared with 5,100 tons in 1924. Over the seven-year period 1919 to 1925 the total delivery amounted to 37,500 tons.

Graham Brothers Leave Dodge Organization

Announcement has been made of the purchase of the balance of the Graham Brothers' interest in Dodge Brothers Motor Company by Dodge interests. This decision of the directors of Dodge Brothers to exercise its option on the remaining 49 per cent of the common stock held by the Graham brothers will result in confirmation of the plan

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set in motion last fall by the Dodge management to secure a substantial position in the motor truck and bus field. In November Dodge Brothers acquired a majority interest of 51 per cent in the Graham brothers' business.

It is understood that the Graham brothers do not own any Dodge stock at the present time, their holdings having been taken over by Dodge interests several weeks ago. Ray A. Graham, formerly general manager of Graham Brothers, stated that the Graham brothers left the Dodge organization entirely of their own volition and that the friendliest feeling exists between the new administration and themselves. Having disposed of their entire holdings of Graham Brothers Truck Company, they have made no plans for the future other than that they intend to take a long-deferred rest.

Brown Boveri Net Earnings $1,708,690

Combined earnings of the American Brown Boveri Electric Corporation and subsidiaries for 1925, irrespective of date of acquisition, show a balance of $1,708,690 after depreciation and interest but before taxes. This equals more than eight times the annual dividend requirements on the 7 per cent cumulative preferred stock, after allowance for dividends of $3.81 on outstanding participating stock.

The report, which is the first issued in pamphlet form, contains a description of the corporation's scope of operation. It points out that the products of acquired companies are non-competitive but related within the electrical industry. The volume of business being booked is in excess of that of a year ago. The report says in part:

> The Camden plant now has enough forward business on its books to enable continuance of current rate of activity for a year.

Springfield Will Consult Tastes of Patrons

Following the example set a year ago by the Grand Rapids Street Railway, Grand Rapids, Mich., of inviting its patrons to make a choice of the kind of car best adapted for use in their city, the Springfield Street Railway, Springfield, Mass., has invited its riding public to make similar suggestions. It desires an expression of opinion as to the type and fittings for a car soon to be built, with the idea of adopting such a car as a basis for future units to be purchased. This suggestion has already borne fruit and many helpful ideas have been submitted.

It is expected that the car will be built in a local shop in Springfield. By the use of certain materials which will give rigidity and strength with less weight than heretofore it is hoped by the company that a car can be built which will compare favorably with the de luxe type motor buses in appearance and comfort.

Metal, Coal and Material Prices

Metals—New York	April 20, 1926
Copper, electrolytic, cents per lb	13.875
Copper wire, cents per lb	16.00
Lead, cents per lb	7.80
Zinc, cents per lb	7.30
Tin, Straits, cents per lb	62.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	1.95
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.325
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.00
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$0.99

Rolling Stock

Pennsylvania Railroad, New York, has asked the Interstate Commerce Commission for permission to issue $17,030,000 of 6½ per cent equipment trust certificates. Among the equipment to be secured by this issue are twenty coaches intended for use on the company's electric lines.

Fort Smith Light & Traction Company, Fort Smith, Ark., expects the early arival of six new street cars which will replace older equipment now in service. The cars will be equipped with plush seats and will embody last-minute features in comfort and pleasing appearance.

Burlington Street Railway, Burlington, Iowa, has purchased through the Iowa Southern Utility Company four additional 25-passenger city type Mack buses. These will be placed in service in Burlington on a 2½-mile route at a 10-cent fare. The schedule calls for continuous operation of eighteen hours a day.

Hamilton Street Railway, Hamilton, Ont., Canada, will order new equipment if the franchise draft agreed to by the company and the City Council's special street railway committee is approved. The schedule for the first year provides for 24 new cars, eight buses or cars; second year, twelve new cars, four buses or cars, and the third year, twelve new cars, four buses or cars.

Track and Line

Berkshire Street Railway, Pittsfield, Mass., will lay double track on North Street, Pittsfield. Excavating is well under way.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has adopted plans for the laying of new rails on East Water Street from Michigan Street south to the East Water Street bridge in conjunction with the city's repaving project. This improvement, one of the largest track construction jobs facing the company this year, will require 90 days to complete and will cost $55,000.

United Railways & Electric Company, Baltimore, Md., can extend the Preston Street line from the present terminus at the Preston Street carhouse to a point near the new plant of the Southern Can Company. It is planned to make the plant and the surrounding territory a large industrial development. The Board of Estimate recently approved this extension.

Power Houses, Shops and Buildings

Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va., plans to spend approximately $500,000 in improvements and expansion. Contracts for a part of this work include an addition to the power station.

Eastern Massachusetts Street Railway, Boston, Mass., is planning alterations and repairs to its carhouse at Melrose, Mass. Bids for the work will be received until April 20. The company is also receiving bids until April 26 for alterations to the carhouse on Winthrop Street, Taunton.

Trade Notes

J. L. Ray has been appointed the general supply sales manager of the Graybar Electric Company, New York, N. Y. Previous to his appointment Mr. Ray was manager of the supply and equipment department of this company.

Allis-Chalmers business in continental Europe will be handled through an organization recently incorporated as Allis-Chalmers (France), with headquarters at 3 rue Taitbout, Paris. H. I. Keen, who has been manager of European sales through the company's district office in Paris, will be the managing director of the new organization. The company has maintained for many years an office in London at 728 Salisbury House, London Wall, F. C. 2.

New Advertising Literature

International Oxygen Company, Newark, N. J., has issued a bulletin describing various types of welding and cutting equipment. In addition to complete outfits for welding and cutting service a full line of accessories for this type of work is illustrated in the booklet.

Universal Crane Company, Cleveland, Ohio, has issued a leaflet calling attention to the important feature of mobility which it claims for its crane in general construction use.

Ohio Brass Company, Mansfield, Ohio, has issued a reprint in booklet form of an article entitled "Gas Welded Bonds on the Erie" by C. A. Nichols, signal supervisor of the Erie Railroad. The article first appeared in the March issue of *Railway Signaling*.

General Electric Company, Schenectady, N. Y., has issued a leaflet illustrating various industrial haulage locomotives of the storage battery type. Mechanical data and principal specifications on the 60-ton locomotive are given, and there is in addition a tractive effort-speed curve. As stated in the leaflet, particular application for this type of locomotive is found in handling heavy loads for short hauls, as is demanded in yard shifting, stock service, quarries, etc. The day's work is handled economically, as no power is consumed while idle between trips.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Readjustment to Permit Financing Through Holding Company

FINANCING to the extent of $65,000,000 done recently by the Associated Electric Company, the largest and most important subsidiary of the Associated Gas & Electric Company, has been attracting attention in the investment field. Included among the properties controlled are several electric railways. The new issue consisted of 5½ per cent convertible debentures sold to yield more than 5.90 per cent. The proceeds are intended to retire various high-rate securities and effect a substantial saving in the aggregate annual interest charges. The refunding constitutes the first step in the simplification of the capital structure of this group of properties. Incidentally the amount of outstanding issues retired under the new financing was $35,846,970, this sum including $5,873,620 of preferred stock. Interest in the operation and its success centers, however, in the purposes behind the issue. Perhaps the most important point is that the makers of the new instrument intend in the future that the operating companies of the Associated group will raise money through the holding company and will not themselves go into the market.

Just how far, if at all, the basic ideas behind the new issues are applicable in the electric railway field is a matter for the financial technician to decide, but it does appear that some of the ideas behind the new issue are in keeping with the suggestions made last year by the advisory committee of the American Electric Railway Association appointed to inquire into the question of financing. The changes suggested by the committee contemplated in some instances a major financial operation. That, of course, was for the extreme case where possible earnings were out of line with the then existing financial structure. These are the rare cases. There are others, however, in which the applications of the principles set forth by the committee can be made a continuing process.

The Pittsburgh Railways furnishes an example of this kind. That company, for instance, came out of receivership with much the same myriad of separate companies that went in, but that company, continuing the plan of eliminating subsidiary corporations where practicable, closed out or merged last year with other subsidiaries sixteen companies. Moreover, the process of retiring bonds is being kept up unremittingly. During 1925 sinking fund retirements totaled $1,210,600, bond retirements $219,000, and total redemptions $1,621,200. Doubtless there are other similar instances, but this one comes to mind in connection with the work of digesting the report of the company for publication in a recent issue of the JOURNAL.

It will not do to dismiss the matter by saying that Pittsburgh is now operating under an agreement that insures to it favorable terms for financing. Many electric railways enjoy an excellent credit rating. They enjoy it because they deserve it. All of them should. But before they do, many of them will have to undergo the drastic financial rearrangement which the committee prescribed for them. The readjustment isn't easy to accomplish. The committee made that plain. Whether or not any of the principles embodied in the Associated Electric financing offer suggestions, such readjustments in finances and in corporate structure as are needed can be carried out. Pittsburgh proves it.

Far-Sighted Transportation Planning Has Made Real Co-ordination Possible

BOSTON is proverbial for the difficulties encountered by strangers in finding their way about. In so far as this condition really exists, it results from the narrow and winding character of the streets in the business district. The local transportation system, on the other hand, has been laid out along lines that are essentially simple and easy to understand. While the actual execution of plans has been hampered by certain physical handicaps and has deviated somewhat from the ideal, results have been attained that are well worth study by any transportation man not already familiar with them.

Subway, elevated, surface car and bus services have been co-ordinated in the city and neighboring towns by the Boston Elevated Railway, as told elsewhere in this issue in an article by Edward Dana, general manager of the system. In a general way, it may be said that east-west and north-south rapid transit lines have been built along the routes of heaviest travel, extending as far as justified by the volume of traffic. Surface car lines radiate from the rapid transit termini into the outlying districts. These surface car lines also serve important intermediate areas where traffic does not warrant rapid transit train operation. By placing the tracks in reserved strips in the centers of the streets and operating three-car multiple-unit trains, service approaching that of the subway and elevated lines is attained on the surface. Downtown the street cars have been placed underground in subways built at great expense, thereby gaining advantages in directness of route and speed of operation that would be impossible on the narrow streets of that district.

During the last few years the bus has been added to the transportation facilities provided by this company. Its development has been rapid. At present the company is operating 190 buses on 25 routes. Bus traffic represents about 7½ per cent of the total carried by the system in the outlying districts. The bus has replaced the street car on some light traffic routes. Crosstown routes have been established connecting the radial rapid transit and surface car lines. More recently, bus service has been extended into the downtown business district to take the place to some extent of the cars which have been placed underground.

The narrow, winding streets which in the first place

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hampered surface transportation in the end necessitated the construction of the subways, which to some extent ignore rambling routes and follow directly the lines of travel. The advent of the bus has made it possible to round out the local transportation system by taking care of certain kinds of traffic the volume of which was not large enough to justify rail operation. It would be going too far to say that the present transportation system in Boston is perfection, but it undoubtedly furnishes a noteworthy example of co-ordinated subway, elevated, surface car and bus service.

Competition Has Tangible Advantages for the Individual

COMPETITION for prizes has been looked on for ages as one of the best means of building character. Under the spur of the contest much more thought and effort will be given to the preparation of plans and perfection of methods than when only the dull routine of everyday affairs is considered. As a means to an end, then, a well-organized contest has a very decided value. Nor is it necessary to be the winner in order to get great benefit out of participation. Every contestant is the better for having taken part.

Competition demands extra thought, extra time and often extra expense on the part of the individual. The sacrifice is often looked on merely as a labor of love, with little hope for any reward save the satisfaction of work well done. But sooner or later it is bound to pay in a more material sense. Take the case of the men who have been active in the past Coffin Prize contests. Many of them were little known in the industry before they entered their companies in the lists. Few stood out in contrast to others. Today several of these men have taken a new and commanding position in the field. They have absorbed a new enthusiasm, a new comprehension of their work. In a number of cases this has led to a very tangible reward in promotion by their own organizations to more important positions. Others have obtained increased recognition in their old positions.

These are elements that should be taken into account by any manager who has doubt in his mind as to his ability to make a good showing in the Coffin Prize competition. The decision to enter is fraught with no danger whatever. For the individual who plans the campaign and places his company in the competition there is most certainly a reward in sight—not only the intangible one of personal satisfaction, but recognition from his superiors and from men in the field generally.

The Product Is Judged Rather than the Means

SOME there are who think they have discovered a royal road to riches. That is evidenced by the large number of persons who visit Monte Carlo each year. A similar tendency toward a gambling spirit may be noted in the case of certain transportation men who, having failed as street railway operators, believe that they can turn to the bus and retrieve their losses. Without giving proper thought to the correct locations to place it, or as to its proper use, they plunge ahead with the feeling that the word "bus" by itself will at once be the open sesame to greatly increased traffic and reduced expenses. Nothing could be more fallacious.

Whether the transportation vehicle be run on rails or on rubber, there are certain laws which govern the operation and which must be observed. Transportation is the product delivered. While there may be a small gain in the number of passengers carried at first when buses are installed, due to the novelty and the curiosity of the public, after the newness is worn off the appeal must be that of good transportation, just as it had to be with the street car.

In the long run, just as much transportation sense is needed to get the public to ride buses as should have been used to get them to ride cars. The bus, of course, has an inherent advantage in that an error in routing can be corrected at less expense than when rails have been laid. It is necessary, however, for the operator to discover whether the routing has been decided on correctly and whether the schedules are fitted to the traffic if satisfaction is to be given to the riding public. And of even greater importance, the public must have the knowledge that its wishes are being given consideration, no matter what vehicle is used.

Safety Zones Present and Future

SHOULD the next census contain an enumeration of developments which have shown great increases during the last few years, it will undoubtedly include safety zones, along with automobile registration, Florida real estate activity and bootlegging.

For many years a very few raised platforms near the foot of Market Street, San Francisco, were practically the sole examples in this country of space reserved in the street for electric railway waiting stations. It is necessary to mention this fact only to disclose the difference between past and present conditions. Now, raised platforms for the safeguarding of persons boarding or alighting from street cars are common from Newark, N. J., to New Orleans, La., and from Jacksonville to the Pacific Coast. Their desirability is generally acknowledged for all situations where the traffic is considerable and the street on which tracks are laid is wide enough to accommodate platforms of this kind. In Detroit some of these platforms even have roofs so that persons waiting for the cars will be sheltered from the weather. There has also been a very great increase of substitutes on the street for these raised platforms, such as areas protected by permanent or movable posts, illuminated hemispherical guards and even painted lines. Indeed, there is hardly a city now so small but that has in its principal street at least one stopping point with some kind of protection for electric railway passengers.

With the merits of the safety zone generally accepted, there are some who believe the public should be guarded even further, and in Detroit it has been suggested that underground passageways be constructed between curb and island platforms to eliminate the dangers of crossing on the surface of the street. Still another plan is a co-ordinated service of buses and trolleys in which the buses would stop every block or two and carry passengers to and from the express stations of the electric railway in the center of the streets.

These proposals indicate a prevailing impression that in busy streets persons passing between car and curb run considerable danger of being injured by vehicles. Indeed, this hazard is usually strongly emphasized by nearly every bus advocate in arguments as to the relative merits of the bus and electric car in city service.

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Actually, the danger of such a passage is usually very slight. Pedestrians crossing from one curb to the other run twice the risk because they have twice as far to go, so that if the trip half way across the street to the safety zone is as dangerous as some persons would have us believe, the trip across the entire street should be prohibited.

As a matter of fact, there is no great danger from either kind of crossing, if made at the proper time. Whether a busy intersection is protected by traffic officer or signals, cross traffic must be permitted at intervals, and it is then that pedestrians are able to make the passage. When there are superhighways without grade crossings, as suggested for Detroit by D. L. Turner, there is time to make provision so that pedestrians may cross on a separate level from vehicular traffic. But that time is far distant in most cities.

Cheap Taxicab Era Ends in New York

EXPERIENCE during the last year and a half has taught the taxicab operators in New York City that the 20-cents-a-mile rate does not produce sufficient revenue to afford them a living. When this low rate was first established, few impartial observers thought that it would be a success. An editorial in this paper for Aug. 2, 1924, predicted that it would prove unprofitable. That prediction has now come true. On May 1 the rates of several companies are to be increased to 35 cents for the first mile and 25 cents for each succeeding mile.

Thus ends another dream of doing a street railway transportation job with some other type of vehicle. It was thought in certain quarters that the taxicab rate of 20 cents a mile with no extra charge for additional passengers would take away a considerable volume of traffic from the established transportation agencies. A group of four people, it was said, could travel just as cheaply by taxi as by street car. The unsoundness of this theory from an economic point of view is evident to any one who compares the relative operating costs of the two types of vehicle. No noticeable loss of traffic has been sustained by the electric railways during the low-rate period. Now the taxicab operators themselves have discovered the mistake in their reasoning and raised the fare. The much-maligned street railway is left without a competitor in providing cheap surface transportation.

That Vanishing Automobile Saturation Point

WE WHO are interested in increasing the business of local transportation agencies have long been anticipating the saturation point of sales in the automobile industry. Ten years ago, in common with most of the automobile industry men themselves, it was generally felt that the saturation point was just around the corner. Years went by, but sales continued to increase. Then it was thought that soon there would be one car in every family, and that surely would be the saturation point. Now there seems some basis for thinking that perhaps there is no saturation point. Instead of one car it is getting so there is a whole "gasoline alley" for each family. Father has his limousine. Mother has her Victoria coupé. Brother has his playboy and sister her brougham. Junior has his flivver—and no one stays at home.

While this vanishing saturation point has been flitting just over the horizon, we are now suddenly given the final blow when we read in Henry Ford's new book that ". . . with our present capacity of 2,000,000 a year we are able to meet the needs only of our present owners if they should each buy a new car every six years."

Ponder that!

The miracle of it all is that the total number of riders on the street railways is higher every year—at least the trend is upward. There is also a natural stabilizing force working against the increased use of individual cars. You may keep on multiplying the number of automobiles sold, but the amount of parking space available is practically fixed. As this becomes less and less adequate to take care of the demand and as the streets and highways become increasingly congested, more and more of the automobile owners tend to revert back to common carrier agencies. But to build regular patrons from occasional riders, it certainly does behoove the railways to concentrate on improving service. More is expected of them than was ever the case before the advent of the automobile.

Regulation by Taxation Is Unsound

"COMMON carrier motor vehicles should pay a fair and reasonable tax for the use of the highways, but regulation should not be attempted through taxation." Here, in the words of Ralph Budd, president of the Great Northern Railway, speaking recently in Kansas City before a meeting of the American Society of Civil Engineers, is a principle worthy of most careful consideration.

Such a viewpoint may well be adopted by every transportation executive. Loading the bus down with taxes is not the right form of regulation. The transportation man who advocates heavy taxes for buses is indeed living in a glass house. Transportation as a whole now carries an undue and unfair tax burden. Many electric railway companies pay more in taxes than they earn in net revenue. There is a tendency in the public mind to look with favor on any proposal to increase taxes on a public utility company.

Although there has been much competition between buses and electric railways under most inequitable conditions from the standpoint of taxation, it is a short-sighted expedient to advocate heavier taxes for buses as the remedy of the situation. Such a policy makes more difficult the problem of getting relief for the railways. Regulation should be by other means than taxation.

Relief for the railways should be approached on a different basis. Taxing the bus heavier will not result in lightening the burden of the railway. Experience during the past few years has shown that when a bus competitor is heavily taxed, the taxes come along with his buses when he is absorbed to form a co-ordinated system.

In the sense that transportation is a public benefit, present heavy tax loads on electric railways are definitely a burden on the public. That is the basis on which the local transportation tax situation must be approached and presented to the public. For one transportation agency to favor increased taxes on another because they are temporarily in competition weakens the whole case before the public. Therein lies the wisdom of Mr. Budd's statement.

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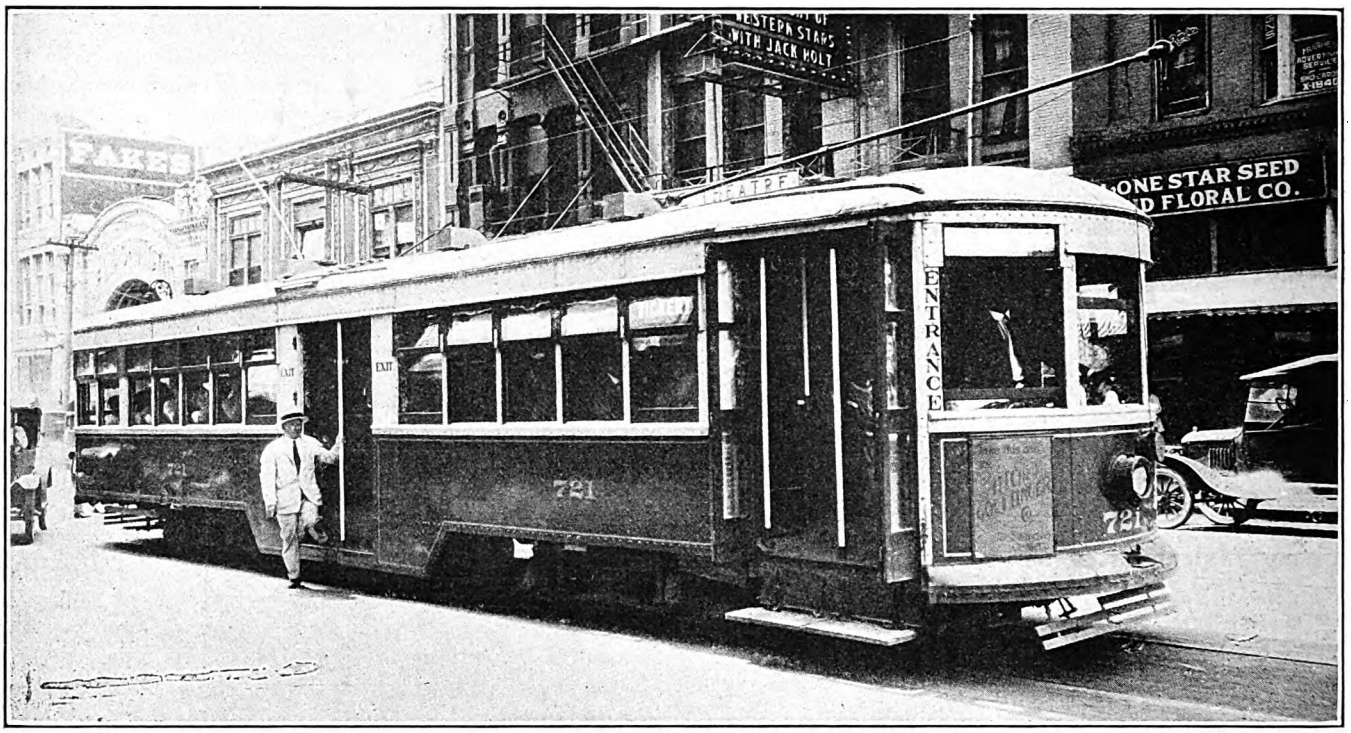


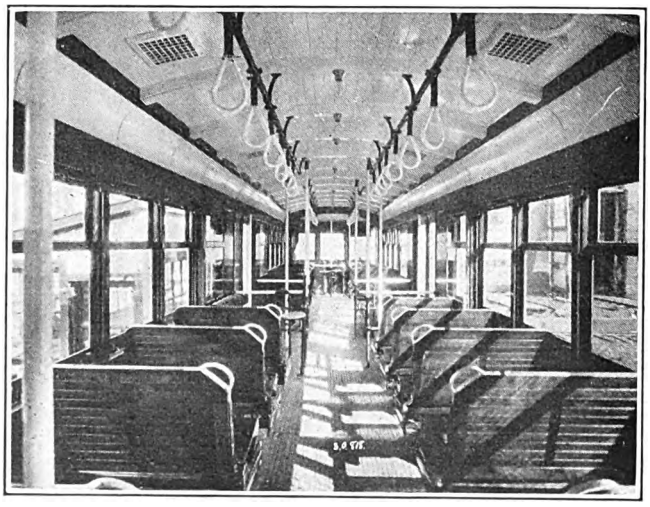
Exterior of Peter Witt Car Used in Dallas. Thirty More Will Be Purchased in Compliance with the New Ordinance

Dallas to Spend $1,500,000 in Service Extensions

Arbitrary Fixed Fare Theory Broken in New Franchise Amendment that Establishes a 7-Cent Fare—Company Will Spend More than $1,000,000 This Year for New Cars, Track and Paving, and Nearly $500,000 to Retire Temporary Loans for Work Completed or Under Construction

DALLAS, TEX., has broken another fixed fare theory of bygone days. On April 7 the City Commission passed an ordinance establishing a 7-cent fare with five tokens for 30 cents to remain in effect until changed by order of the commission. It is of particular interest to the Dallas Railway that the people of that city and its commission established in this ordinance a rate basis that recognizes a fair return on a fair valuation, without regard to the 5-cent fare which was established in the 1917 franchise, which in turn will open the doors of investment channels so as to allow the company to make the extensions and improvements much needed to provide adequate service in this fast-growing metropolis of the South.

Of immediate value to the city is the agreement of the company to follow out the program of expenditures equaling nearly $1,500,000, outlined by Supervisor of Public Utilities John W. Everman. This budget includes nearly a half million dollars for the repayment of notes and car trust securities covering expenditures for improvements and cars purchased during the last two years by the company in anticipation of the final settlement of this franchise. Some of this money was borrowed from the company's reserves.



Interior View of Dallas Peter Witt Car

More than $1,000,000 remains to be spent in accordance with the program that is given in the table on page 751.

Thirty new Peter Witt cars, similar to those now in operation, will be purchased immediately, and 50 other cars will be rebuilt for one-man operation. This requires the installation of safety devices, including rear door exits equipped with a treadle device. It is planned to expend an additional amount in excess of the franchise budget in the construction of several new cars in the company's

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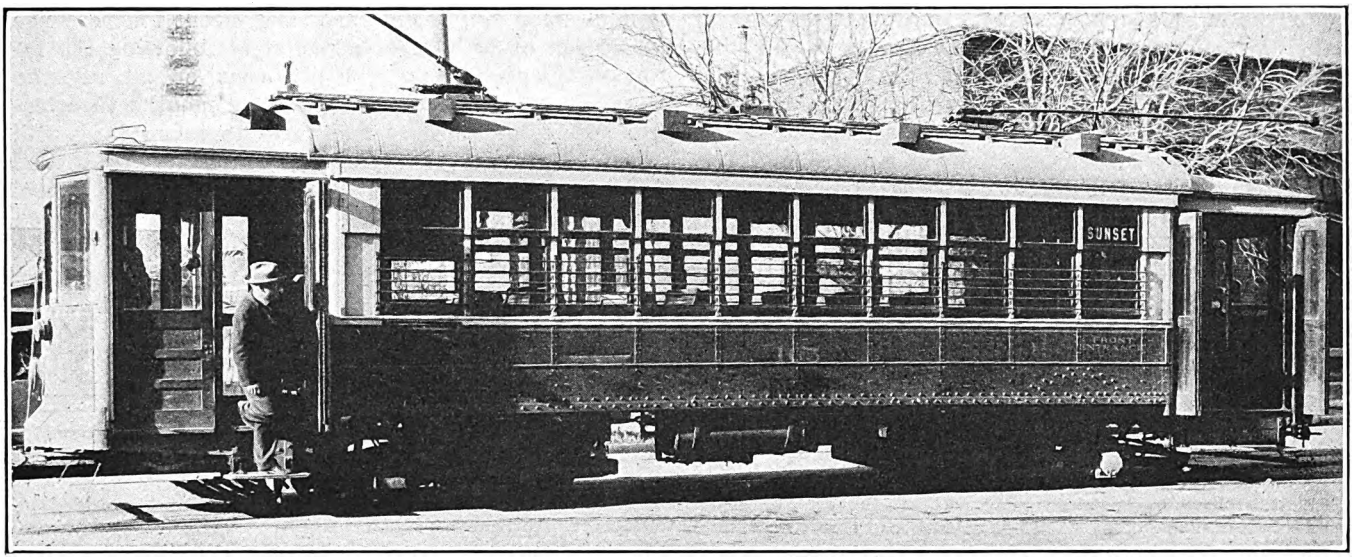


Exterior of Earlier Type of Car, 50 of Which Will Be Changed Over for One-Man Operation. Complete One-Man Safety Features Will Be Used and Automatic Treadle Equipment Will Allow Rear Exit Operation

shops. The plans for these cars are now being developed.

Of particular interest is the construction of 5.43 miles of new track as extensions to six different rail lines into territories that have been served in the immediate past by buses. This is one of the earliest replacements of this kind that has been made in line with the theory generally adopted in recent years that the bus is useful to serve new territory as a forerunner to the railway extension. The buses thus replaced will be used as further extensions or on new routes as conditions warrant.

Something over $400,000 will be used for paving projects on car line streets that will be repaved by the city during the year. Approximately $115,000 will be used to rebuild three railway lines which are a part of Everman Plans one, two and three.

Partly due to extensions and partly to improve the present overhead distribution system $35,000 will be spent for new feeders and equipment. Since the company purchases direct-current power no new substation equipment is contemplated in this budget.

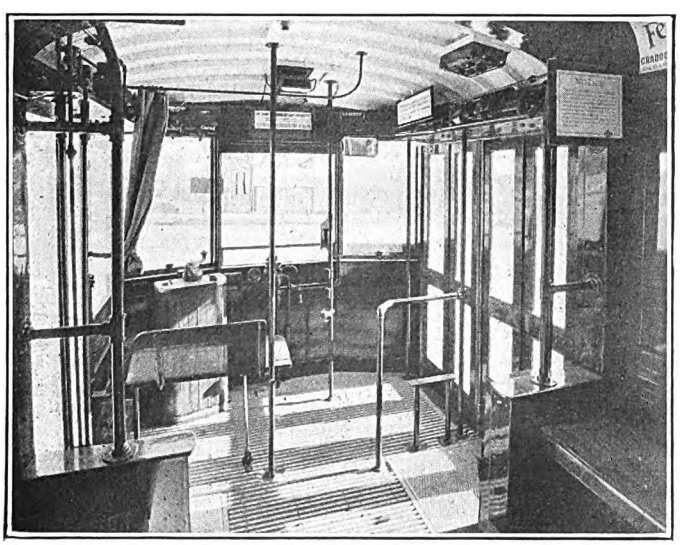
In the event that the estimates for work to be done prove more than necessary the company has agreed to expend any moneys so saved for further extensions and betterments as may be directed by the supervisor of public utilities.

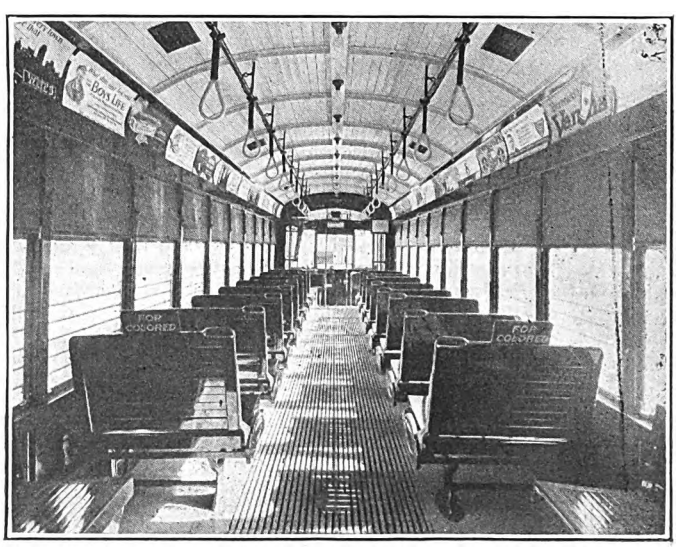
Since the passage of the new fare ordinance the company officials and staff have been busy with the details of the work to be accomplished in the next few months.

For several years the company has operated on a flat 6-cent fare granted for brief periods of a year or eighteen months at a time. These fare grants have

ANALYSIS OF EXPENDITURES AT DALLAS

Equipment:	
Pay balance due on car trust certificates for 30 new cars in March, 1924	$137,484
Purchase of 30 new Peter Witt cars	450,000
Re-equipping 50 double-truck cars with modern appliances for one-man operation	50,000
Total equipment expenditures	$637,484
Power:	
New electric feeders and improvements in distribution system	35,000
Way and Structures:	
Extension of track on six lines. Service heretofore rendered by buses, but traffic thus developed now renders rail extensions advisable	194,000
Rebuilding track on three lines	115,000
New paving required by city	434,814
Total way and structures	$743,814
Contingencies	50,000
Grand total	$1,466,298





Interior Views of a Two-Man Car Changed Over for One-Man Operation. Dallas Plans to Change Over 50 of These Cars

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been given in exchange for certain improvements agreed to by the company and have been the basis for the three Everman plans. While this has helped to give the company a much-needed increase in gross revenue, uncertainty of the continuance of the higher fare precluded the possibility of permanent financing. Both the city and the company suffered from this condition.

It is felt by the management that this amendment will make possible the issue of bonds to cover the major portion of these new expenditures, and of preferred stock to cover the balance, on a favorable basis because of the stability thus offered by this new amendment.

It is yet somewhat of a conjecture as to the relative split between full 7-cent fares and 6-cent tokens. The proportion of full fares immediately following the increase averaged about 39 per cent of all revenue fares. It will naturally take several months to determine what the ratio of full fares to token fares will ultimately be. Children and school students are entitled to half rates according to the franchise. The school tickets must be purchased at the company's office on certificate from the proper school authorities stating that the applicant for such reduced rate transportation is a bona fide student of a recognized school. Reduced fare tokens are sold by the conductors or at the company's offices in lots of five for 30 cents.

Abstract of Dallas Railway Ordinance Adopted April 7, 1926

Now, therefore, be it ordained by the board of commissioners of the city of Dallas:

Section 1. That from and after midnight of the day and date this ordinance becomes effective and subject to and in accordance with the terms, provisions and conditions of the aforesaid franchise ordinance of 1917, and upon conditions that the railway company does and performs promptly and with reasonable diligence, those things required to be done by it by the above recited report of the supervisor, and as and when ordered and required by the board of commissioners and supervisor of public utilities of the city, except that instead of agreeing to furnish from time to time $1,000,000 of new money as required by said report of said supervisor, the railway company shall furnish and pay said $1,000,000 into the treasury of the railway company before the acceptance of this ordinance by the railway company, the railway company is hereby authorized to charge and collect rates and fares in accordance with the schedule hereinafter set forth until such time as the board of commissioners, after a hearing had upon its own motion, or upon application of said railway company, shall by ordinance or resolution change said rates, said schedule of fares being as follows:

1. A maximum fare of 7 cents for all persons twelve years of age or over, provided five tickets or tokens shall be given for a cash payment of 30 cents.

2. The fare for children between the ages of five years and twelve years shall be 3 cents to be dropped into the box on the car.

3. Students not above seventeen years of age of institutions of learning as defined in the general laws of the state of Texas relating thereto, shall be carried for the half fare provided for by the state law upon the presentation of tickets to be provided and purchased at the Dallas Railway Company's office by persons exhibiting identification certificates and entitled to such reduced fare.

4. That children of five years of age or less when attended by passengers above said age shall be carried free on the cars of said railway company.

5. That all tickets or tokens issued under the former rate by the railway company and which are unused and in the hands of bona fide owners shall be honored by the said Dallas Railway Company and its conductors and operators until all such tickets or tokens have been used, as a cash fare under the rate herein authorized.

Section 2. That the railway company shall issue tickets or tokens in convenient amounts under the rates herein authorized and place the same on sale in accordance with the directions of the supervisor, and unless otherwise directed by the supervisor, such tickets or tokens shall be required to be kept for sale to each passenger by each conductor on cars having conductors and by the motorman on cars having only motormen.

Section 3. Free universal transfers shall be issued by the Dallas Railway Company in the manner and in accordance with regulations now in force.

Section 4. Out of said $1,000,000 new money so to be placed by the railway company in its treasury before accepting this ordinance as hereinbefore provided, the reserves provided for by said franchise ordinance of 1917, and now depleted as by said supervisor's report set out, shall be replenished. For the purpose of doing the things required of it, the aforesaid report of the supervisor and this ordinance, the railway company shall use that portion of the aforesaid million dollars not necessary to replenish said reserves, the money out of said $1,000,000 used to replenish said reserves and likewise any money in said reserves immediately prior to the acceptance hereof, and that may accumulate in said reserves during the doing of the work required of said railway company by aforesaid report and this ordinance, and not immediately required for other purposes, for which said reserves were created. If aforesaid moneys are not sufficient to do all the things required by said report to be done, then said railway company shall and does by the acceptance of this ordinance, agree to furnish such additional new money as shall be required to complete said things to be done by it as aforesaid. Said additional new money shall be furnished as and when the board of commissioners or supervisor shall direct or require. If the cost of doing the things to be done by the railway company under said report is less than $1,450,000 the railway company by the acceptance hereof obligates itself to expend the difference between such cost and $1,450,000 in making such other and further extensions, betterments, improvements, repairs and replacements not included in aforesaid report, as the board of commissioners or supervisor may direct, and if the said $1,000,000 together with the reserves now on hand and hereafter accumulated to the date when said work is completed, do not amount to as much as $1,450,000, then said railway company by the acceptance hereof, agrees to furnish such amount of new money as with said $1,000,000 and said reserves will make the sum $1,450,000. The amount to be allowed said railway company for property value for the furnishing of the above mentioned new money and doing the things required to be done by aforesaid report, shall be determined by said franchise ordinance of 1917.

Section 5. Nothing herein shall be construed as waiving, modifying, altering, changing, enlarging, diminishing or abrogating as to the city, the railway company, or any other person or corporation, the several terms, provisions, covenants and conditions of said franchise ordinance of 1917, save and except that until otherwise ordered by the board of commissioners as herein provided, the railway company shall be authorized to charge and collect the fares herein specified.

Section 6. The ordinance passed on Jan. 19, 1925, extending the 6-cent fare for a period of eighteen months, and all other ordinance and parts of ordinances in conflict herewith are hereby expressly repealed.

Section 7. This ordinance shall not become effectual unless and until the railway company shall within ten days from date hereof file its written acceptance of the terms and conditions hereof and obligate itself to be bound thereby and shall before the filing of such acceptance place in its treasury the sum of $1,000,000 in new money.

Section 8. The urgent demand for increased street car facilities and the street paving improvements and the great improvement specified in such supervisor's report in order to provide adequate transportation facilities for the people of Dallas, creates an urgency and an emergency in behalf of the public peace, health and safety that requires this ordinance to become effective immediately; and it is, therefore, accordingly hereby ordained that this ordinance shall become effective immediately upon its passage as in the charter in such cases made and provided. Passed April 7, 1926.

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Every Automobile Driver on Entering Birmingham on Any of the Principal Highways Must Pass Two Signs Like This

Campaign for More Traffic Brings Results in Birmingham

The Direct Method of Advertising Included the Use of Newspapers, Billboards, Car Signs and Moving Picture Reels—Coincidentally Efforts Were Made to Improve the Service in Many Ways—Trainmen Enlisted as Ride Salesmen

NO DOUBT exists in the minds of the officers of the Birmingham Electric Company of Birmingham, Ala., that the special campaign for traffic which it has been conducting during the past eight months has brought results. Strictly speaking, the campaign has been broader than one for more business only. It has included equally strenuous and effective efforts toward improved public relations, particularly in the direction of acquainting the public with the problems of public utility operation, of making them realize that the purpose of the company and of its officers is to serve them, and bringing the residents of Birmingham into partnership in the enterprise. This latter purpose has included the sale to customers of a certain amount of 7 per cent preferred stock. The company now has more than 3,000 stockholders among the citizens of Birmingham.

But action by the company has not ended with the sale of this stock. Coincidentally there has been a strong effort to improve service in every way possible, to convert automobile users into passengers and to bring home to the public the fact that the Birmingham Electric system is being operated by citizens of Birmingham for citizens of Birmingham.

Changing the Auto Driver Into a Rider

The good roads about Birmingham and the practical absence of snow in winter encourage the use of private automobiles to a great extent. One feature in the campaign to change the private automobile user to a car rider when he uses his car in preference to the trolley is a series of large billboards placed at points on the highways entering the city where they will attract the attention of the automobilist. All of these boards carry the slogan "Use the Street Cars," coupled with some other injunction, changed from time to time, like "save the difference," "avoid parking troubles," "they are safe," "they are reliable," "save time, worry and expense," "avoid traffic troubles."

Altogether there are 21 billboards used for this purpose. Two of them are 10 ft. x 50 ft.; the others are 10 ft. x 24 ft. There are nineteen additional painted boards of similar type, using a red background with white letters. The larger billboards are illuminated at night. Every automobilist entering town on any of the principal highways must pass two of these boards.

In its regular advertising space which it carries in the daily papers in Birmingham, as well as in all the weekly papers published in the county, the company has also given considerable space to the private auto user. In these advertisements the trouble in securing parking space has received attention, as two of the advertisements reproduced illustrate.

Dash and window signs are used extensively for the same purpose. With single-end cars the dash signs are carried on the right-hand side of the car in front and rear. The lettering is similar to that used on the billboards. A popular window sign is a series of narrow

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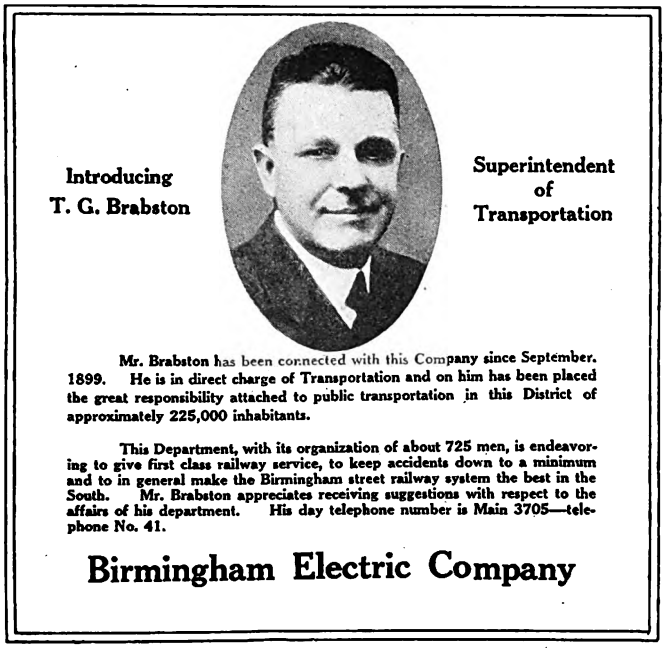
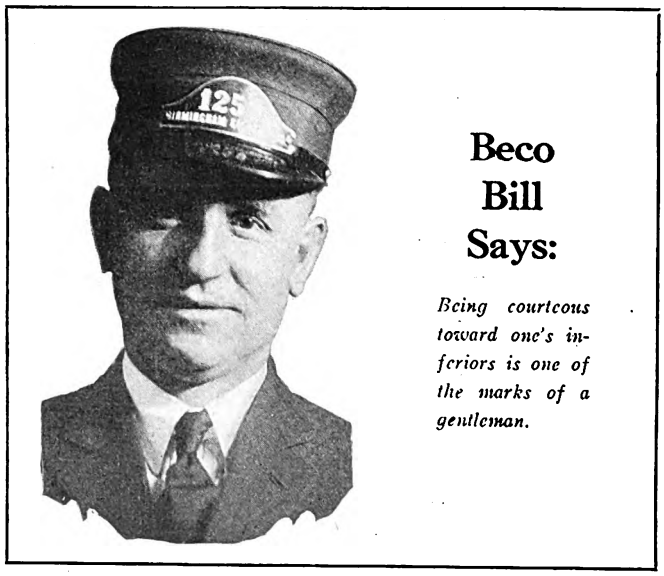


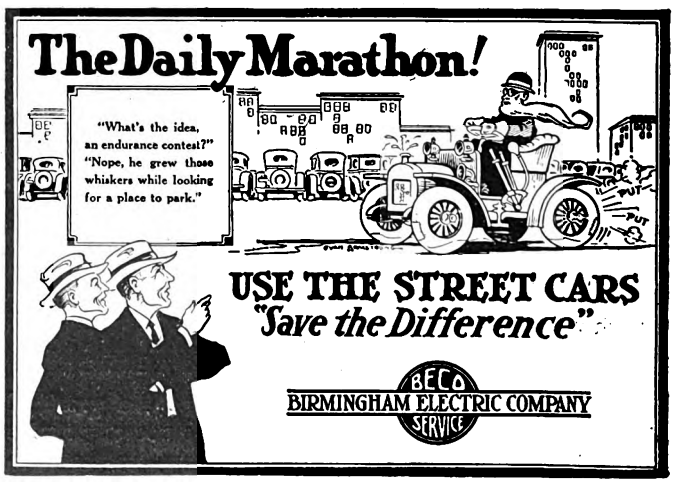
A Series of Advertisements Introduced the Railway Officials and Their Work to the Public

slips pasted on the six upper sashes in the middle of the car, with lettering very much like that on the posters. In the accompanying view of a typical car the dash sign reads, "Use the Street Cars, Avoid Parking Troubles," and the upper window signs read, "Use the Street Cars—Safe, Economical, Dependable." The lettering on the inside of these window signs differs from that on the outside, as the latter is intended for the auto driver, whereas the inside is read only by the car rider. To him the message is, "The operator of this car is chosen for what we believe to be his efficiency," or "The more passengers who ride on this car the better service we can give," or some message of similar tenor. These window signs are changed once a month, while the dash signs are changed once every week.

Besides the newspaper advertising mentioned the company uses theater and other program advertising, has a large advertisement on the drop curtain in the principal theater in the city and has a motion picture slide in colors in all the motion picture houses in Birmingham. It also developed some time ago a split reel devoted to the difficulties of parking an auto in the business streets of the city. All those who took part in the preparation of this reel were members of the transportation department and it represented the difficulties which "Miss Birmingham" had in finding a place to park her car during a shopping trip. Its title was, "Miss Birmingham Goes Shopping." No mention



Beco Bill Is the Traction Tom of Birmingham



Recent Advertisements in the Birmingham Papers Call Attention to the Difficulty of Getting Parking Space

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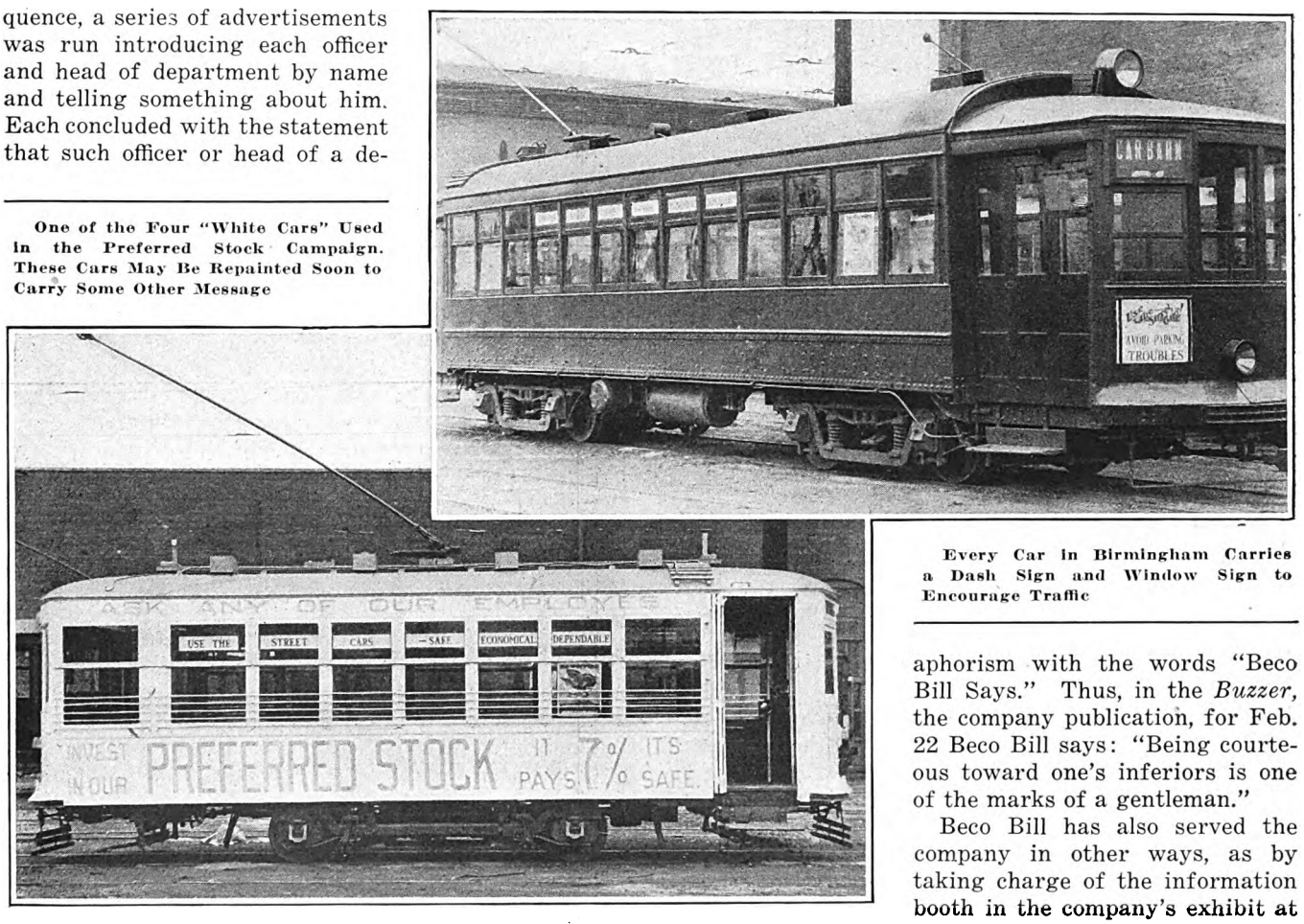
was made in the reel of the company, but the moral was just as evident. The reel was so good that it was shown in fifteen theaters in the city without any charge to the company.

INTRODUCING THE OFFICERS

One thought which came to the management was that the methods and policies of a large utility company may often be misunderstood by the public because the company seems impersonal to some extent. In a small town this would not be the case, but in a city the size of Birmingham, with its 300,000 inhabitants, all of the officers and heads of departments cannot know everybody. What is more natural, then, than that they should be introduced. In consequence, a series of advertisements was run introducing each officer and head of department by name and telling something about him. Each concluded with the statement that such officer or head of a department would be glad to have any criticisms or suggestions relating to his department. The company's service includes electric light and gas as well as railway, so that ten or twelve advertisements appeared in this series. Two of them are reproduced.



One of the Four "White Cars" Used in the Preferred Stock Campaign. These Cars May Be Repainted Soon to Carry Some Other Message

Every Car in Birmingham Carries a Dash Sign and Window Sign to Encourage Traffic

TRACTION TOM BECOMES BECO BILL

This method of advertising took care very well of the officers and heads of the department, but obviously was impracticable with the transportation employees, as they number more than 700. Nevertheless, they come in daily contact with the patrons of the road. It was therefore decided to have a personage to represent the large body of men on the property who are not officers or heads of departments. Such a person, it was felt, would seem more real than any mythical individual, but the management did not feel like making any choice which would seem invidious. It was therefore decided to leave the selection to the men themselves.

The plan was explained to the trainmen, who were asked to select some one of their number whom they considered representative of the transportation men—not necessarily an Adonis and not an aged Nestor—but some red-blooded young man who would supply the need. The men acquiesced and Beco Bill became a reality. Beco, it might be said, is a popular contraction in Birmingham for Birmingham Electric Company, and Bill was adopted for euphony.

Beco Bill, who is trainman 1259 and one of the regular employees of the company, figures to a considerable extent in the company's advertising, company publications and other literature. A favorite way of using his name is to introduce some injunction, advice or aphorism with the words "Beco Bill Says." Thus, in the *Buzzer*, the company publication, for Feb. 22 Beco Bill says: "Being courteous toward one's inferiors is one of the marks of a gentleman."

Beco Bill has also served the company in other ways, as by taking charge of the information booth in the company's exhibit at the recent Alabama State Fair.

Among the other means for developing traffic, the company pays a great deal of attention to keeping its cars well painted and clean and insists that its transportation men are neat in appearance when on duty. All cars are washed once a day by a spraying machine. The trainmen are encouraged to keep trim by having in each operating carhouse a free shoe-shining stand and a full length mirror in which they can inspect themselves from head to foot. On the top of this mirror are painted the words, "Do you think you represent Beco service?" The company does not claim it is the only one to use a mirror in this way. It does assert, however, that the mirror is appreciated by the men who take the same pride as a soldier in looking orderly and trim.

In the instruction of new platform men a great deal of emphasis is laid on the need for courtesy and salesmanship, and the same point is made in talking with the

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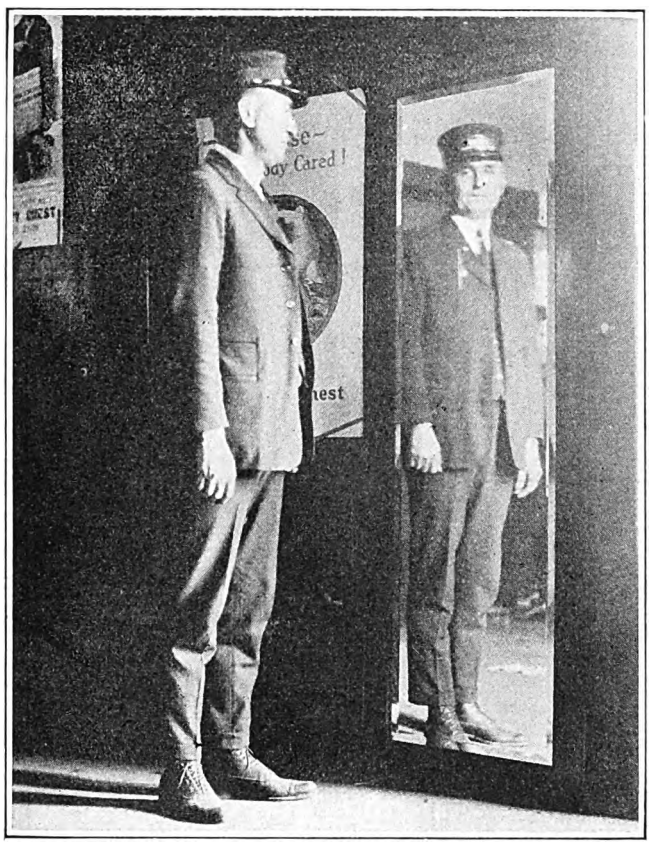
older men. They are the "ride salesmen" of the company. The dispatchers also take care to see that the men when assigned to cars are neat in dress and appearance. Safe operation is encouraged by injunction and also by conspicuous markers at the main carhouse showing the accidents by divisions. These markers are four large clocks, one for each division, indicating by a black hand the number of accidents on that division to date in the current year and by a red hand the number in the previous year. Every trainman who has gone six months without an accident for which he was responsible or without being reported for dereliction of duty receives a bronze medal. If his record in these matters continues for a year he receives a silver medal, and if for two years a gold medal. A number of men in the employ of the company wear gold medals of this kind.



A Full-Length Mirror in the Carhouse Helps the Trainmen to Keep Neat

Only one other means of promoting traffic used in Birmingham will be mentioned. This is the publication of a large map showing the lines of the company. Some ten or more of these maps were framed and set up at principal points in the city, each map being marked in red with the point where the map was displayed. The maps proved so popular that the company has been requested to supply a similar map to each of the 70 public schools of the city.

After all, it is the results which count. The company has had a gratifying increase in its patronage during the last year and attributes at least a part of it to its methods of traffic promotion. During 1925 the company carried about 68,000,000 transfer and revenue passengers. As 2 cents is charged for a transfer there is more reason for including transfer passengers in such a count than on those electric railway lines where transfers are free.

Standard Traffic Signs Used in Winnipeg

By H. G. Stewart
Superintendent Railway Distribution Winnipeg Electric Company

FOR the guidance of patrons and as a visible reminder to motormen to observe bulletined instructions, the Winnipeg Electric Company, Winnipeg, Canada, has adopted a system of signs which are attached to the trolley span wires at various locations. It was the aim in designing these to make them a distinctive shape and as conspicuous as possible without being unsightly. The material used is No. 16 gage sheet iron and in all cases the lettering is black on a white background with a finishing coat of clear varnish. The top of the sign is slotted in two places through which ⅛-in. x ½-in. galvanized strap iron hooks are crimped.

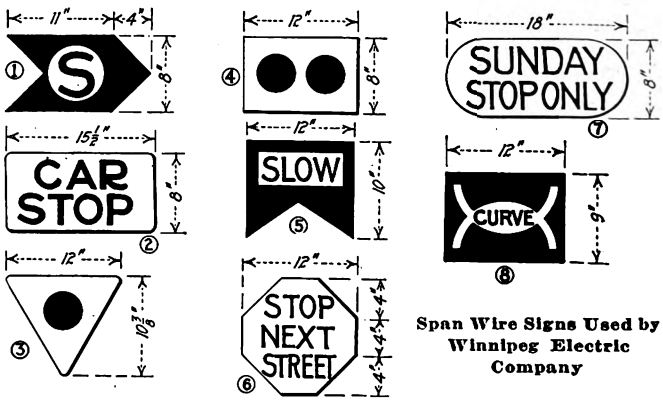
A *"Safety Stop"* is placed at railway crossings other than those which are protected by watchmen or automatic signals and at the foot of intersecting inclines. It warns motormen to come to a stop and then proceed cautiously. In many locations on the Winnipeg system poles are not available for the usual car stop indications as, for instance, where span wires are attached to eyebolts in buildings. At such points a *"Car Stop"* sign indicates to the public and train crews a loading and unloading station.

A *"Car Stop—Next Street"* sign is erected at locations which were formerly regular stopping places that have been discontinued. It is for the information of the public who, through habit, expect to board cars at these places. It is removed when it has served its purpose.

For the convenience of the public this company makes it a practice to have cars stop on Sundays opposite all church doors or at intersecting streets where churches are located and which are not ordinarily a regular stopping place. A *"Sunday Car Stop"* sign advertises this fact to the public.

A *"Circuit Breaker"* sign warns motormen to pass under trolley section insulators with power off. An *"Electric Switch"* sign is a reminder to observe the rules governing the operation of electric track switches.

At the approach to extensive special trackwork, such as leads into carhouse or at the approach to temporary track laid during reconstruction, a *"Drive Slowly"* sign appears. It notifies that cars are to be operated across this special work cautiously and slowly.



Span Wire Signs Used by Winnipeg Electric Company

1. Safety stop.
2. Ordinary car stop.
3. Section insulator.
4. Electric switch.
5. Special work sign.
6. Discontinued stop.
7. Church stop.
8. Non-clearance curve warning.

On this system practically all intersections and curves were designed for car clearance. In a few instances where clearance could not be obtained *"Non-clearance"* signs warn motormen that cars cannot pass each other.

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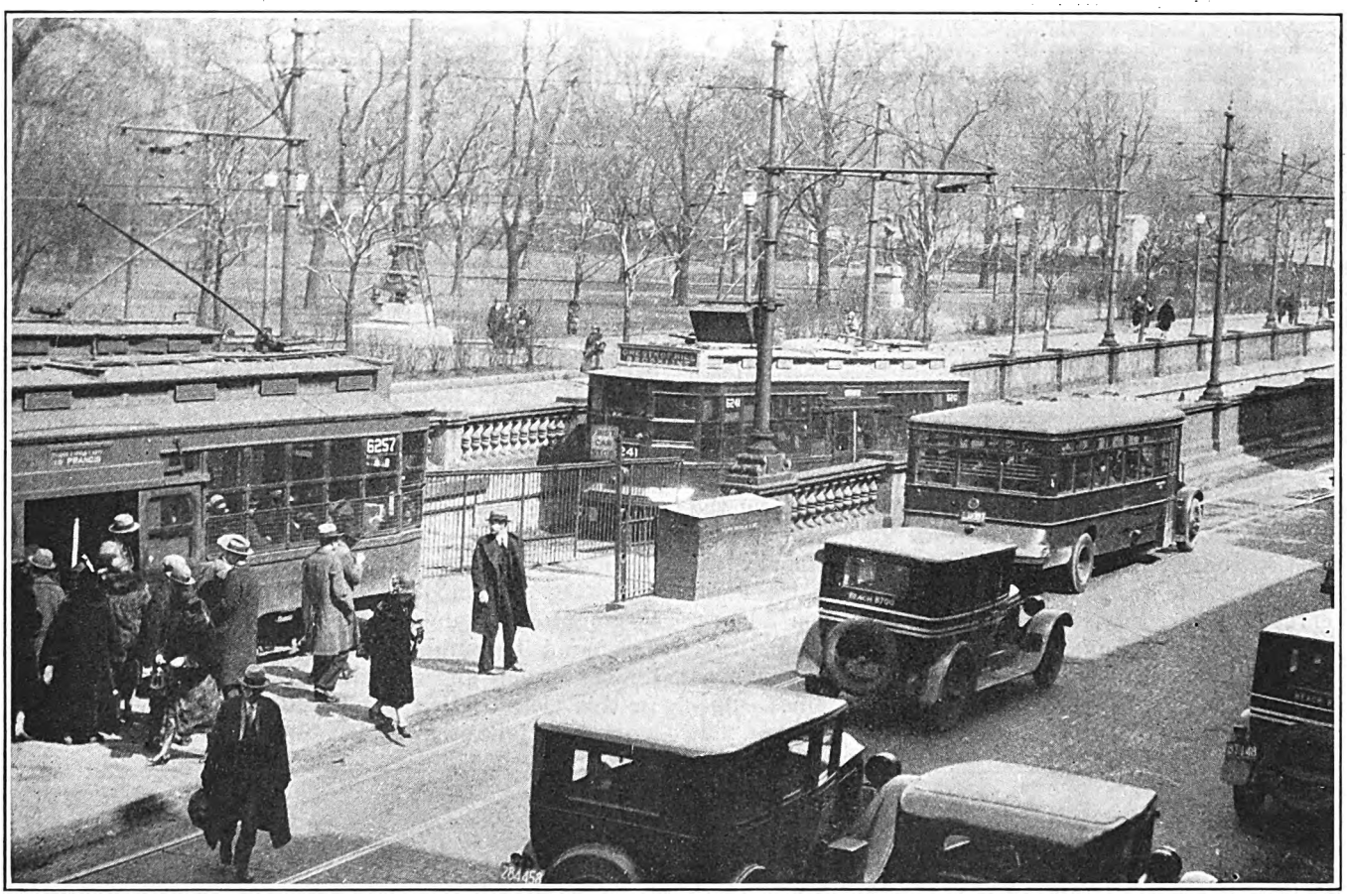
Buses Supplement Rail Transportation System in Boston

Rapid Development of Auxiliary Bus Service by the Boston Elevated Railway Has Occurred During the Past Two Years—In Part This Service Replaces that Formerly Given by Street Cars, but Considerable New Route Mileage Has Been Added

By Edward Dana
General Manager Boston Elevated Railway



From This Point the Boylston Street Bus Continues on the Surface Through the Downtown District While the Cars Go Underground

CO-ORDINATION of four distinct types of transportation has been accomplished during the past few years by the Boston Elevated Railway. On Feb. 24, 1922, the first bus line was established to supplement the existing street railway, elevated and subway services. Since then this auxiliary service has been developed until 190 buses on 25 lines are now carrying passengers at a rate of 27,000,000 a year. Bus traffic represents approximately 7½ per cent of the total carried by the system.

Bus routes fall into three general classifications. Of the total of 25 routes, five render transportation service in new territory not previously served. Seven have in part replaced former car service, but have also been extended into new territory which the cars did not reach. Twelve have been straight substitution of buses for cars, one is operated only at night in place of owl car service. In general, the fare on buses is 6 cents for a local ride and 10 cents when transfer to other parts of the system is desired. This is the same as the fare on the cars, the 6-cent fare entitling a passenger to a local ride without transfer privilege and the 10-cent fare entitling a passenger to go from practically any point on the system to any other point on the system using buses, street cars and underground or elevated rapid transit lines.

Round-trip route mileage, running time, number of trips daily, type of service and rates of fare for the various bus lines are given in an accompanying table. The total miles of streets covered by bus routes is 49.177. Each day 3,130 trips are operated, making a total of 12,659 bus-miles. At present, the daily mileage operated is about one-fifth of that operated during the entire year of 1922, when bus service was in-

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SUMMARY OF BUS OPERATION BY BOSTON ELEVATED RAILWAY

Route	Round Trip, Mileage	Round Trip Running Time	Trips Daily	Total Miles Daily	Type of Service	Fare, Cents, Local	Fare, Cents, Including Transfer
Wolcott Square—Cleary Square	2.74	16	22½	61.65	Replaced car service	..	10
Wolcott Square—Mattapan Square	6.40	36	82½	528.00	Replaced car service	..	10
Cleary Square—Mattapan Square	3.66	20	6½	23.79	Replaced car service	..	10
Rowes Wharf—Summer and Arch	1.16	10	139	161.80	Replaced car service	5	None
Haymarket Square—Battery and Commercial	1.25	11	77	96.25	Replaced car service	5	10
Belgrade and Center—Center and Eliot	5.23	30	101	527.83	New territory	6	10
Church Street—Center and Eliot	4.67	28	8	37.36	New territory	6	10
Copley Square—South Station	2.90	15	67	194.10	New territory	6	10
Park Street—Granite Bridge	3.52	17	217	763.84	Replacement and extension	6	10
Park Street—Pierce Avenue	2.22	12	45	96.35	Replacement and extension	6	10
Center and Spring—Grove and Washington	2.56	12	54	136.89	Replaced car service	6	10
Andrew Square—Old Colony Avenue	1.33	6	38	50.69	Replaced car service	6	10
North Station—South Station	2.20	18	109½	241.23	Replaced car service	6	10
Union Square (Allston)—Brooks and Faneuil	3.75	18	119	446.13	Replacement and extension	6	10
Green Street—Ashby and Commonwealth	2.63	16	189	496.69	Replaced car service	6	10
Green Street—Granite and Brookline	1.96	10	60	117.54	Replaced car service	6	10
Harvard Square—Kendall Square	4.40	22	130	572.26	Replaced car service	6	10
River and Blackstone—Central Square (Cambridge)	1.39	8	130	180.83	Replaced car service	6	10
Huntington and Longwood—Brookline and Longwood	0.91	6	13	11.82	Replaced car service	No fares collected	
Fenway—North Station	6.05	34	239	1,445.95	Replacement and extension	6	10
Harvard Square—Scolly Square (night bus)	6.87	30	25	171.80	Replaced owl car service	..	10
Union Square, Allston—Union Square, Somerville	6.82	30	132	899.71	New territory	6	10
Main and Massachusetts—Bowdoin Square	4.09	21	195	797.55	Replaced car service	6	10
Medford Square—Fellsway	2.98	16	98	292.24	New territory	6	10
Magoun Square—Sullivan Square	4.21	24	188	791.67	Replaced car service	6	10
Central Street, Somerville—Sullivan Square	3.69	16	40	147.64	Replaced car service	6	10
Faulkner—Cross and Main	2.84	12	137	389.35	New territory	6	10
Medford Square—North Cambridge	5.82	34	136	791.93	Replacement and extension	6	10
Upper Highland Avenue—Broadway North via Malden Square	7.90	36	82	647.47	Replacement and extension	6	10
Fellsway and Medford Street—Linden	7.79	40	158	1,231.29	Replacement and extension	6	10
North Street—Arlington Centre	3.35	20	92	308.29	Replacement and extension	6	10
			3,130	12,659.94			

Total number of main bus routes 25
Total miles of streets covered by bus routes 49.177

augurated. The extent of operation in each year is shown in the following table:

BUS MILEAGE OPERATED, BY YEARS

	Miles
1922	63,927
1923	465,382
1924	890,901
1925	2,472,456

In the outskirts of the city most of the bus routes are replacements of former car lines, although in many instances extensions have also been made. Among the routes in this class are those in Hyde Park, Dorchester, West Roxbury, Brighton, Cambridge, Malden and Medford. A route from West Roxbury to Jamaica Plain serves new territory, as does one from Union Square, Allston, to Union Square, Somerville.

Bus routes are shown on an accompanying map as well as the surface car, elevated and subway lines. Special interest, perhaps, attaches to the bus routes that are operated in the congested downtown business district of the city.

Surface car lines in the congested district have to a large extent been superseded by underground rapid transit lines. North and south rapid transit is now provided by the Washington Street subway, while east and west rapid transit is taken care of by the East Boston Tunnel and the Cambridge Subway. Surface cars are operated over the East Cambridge Viaduct and in subways between North Station and Kenmore Station at the intersection of Commonwealth and Beacon Street and also under Tremont Street as far as Broadway.

For the accommodation of short riders who do not care to go into the subways for a short trip, the company has found it desirable to inaugurate a bus service to a limited extent in the downtown section of the city. In this classification are the Rowes Wharf, the Haymarket-Battery, the Copley Square-South Station, the

A Transfer Point Between Cars and Buses in the Suburbs—Field's Corner, Dorchester

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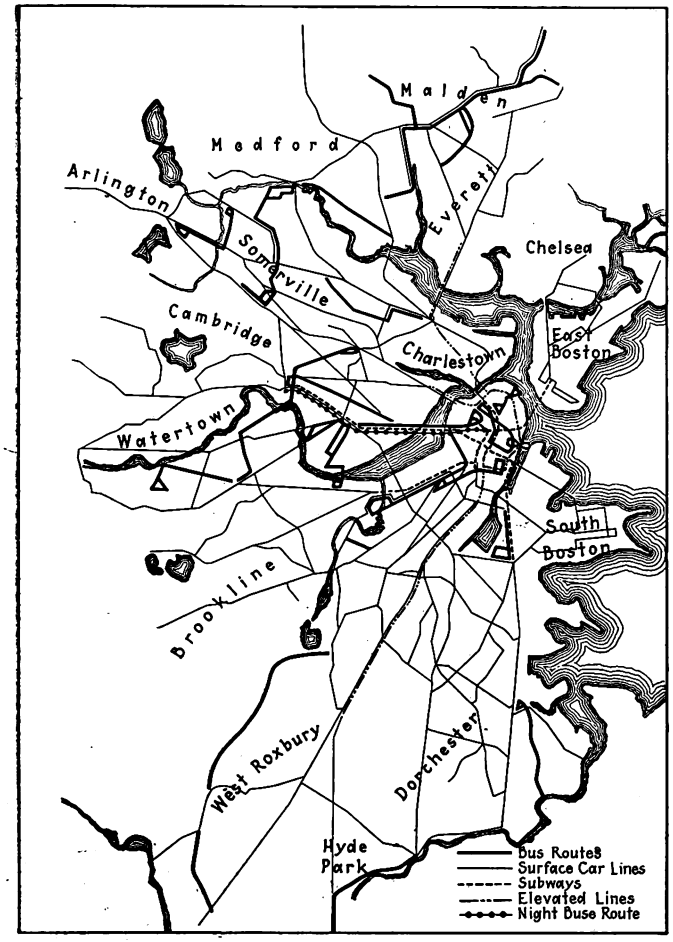


Four Kinds of Transportation Service Are Given by the Boston Elevated Railway Over a Network of Routes Covering the Entire Metropolitan Area

South Station-North Station and the Fenway-North Station routes.

On the route from the Fenway to the North Station, which follows Boylston Street above the subway, crosses along Charles Street between the Common and the Public Gardens and thence to Bowdoin Square and the North Station, an experimental double-deck bus will soon be tried. One such vehicle has been purchased from the Six Wheel Company of Philadelphia. This is the same general type of vehicle as that which is being operated in Cleveland, as told in ELECTRIC RAILWAY JOURNAL, March 24. It is believed that on a route of this kind, passing through the high-class shopping district of the city, double-deck service is likely to prove popular.

Bus equipment operated by the railway is shown in the following table:

BUS EQUIPMENT OF BOSTON ELEVATED RAILWAY

Number	Chassis	Body	Seats
55	White	Brown	25
1	White	Kuhlman	25
25	White	Brown	29
42	Mack	Mack	29
32	Mack	International	25
3	Mack	Boston	25
11	Yellow	Yellow	29
2	Fageol (one de luxe)	Fageol	29
1	Six Wheel double deck	American	61
18	International	Niagara	25
190			

The buses are operated from three stations, Arborway, Bennett Street and Salem Street. Garages have been provided at Arborway, Allston and Salem Street. An additional garage is now contemplated in the vicinity of Union Square, Somerville.

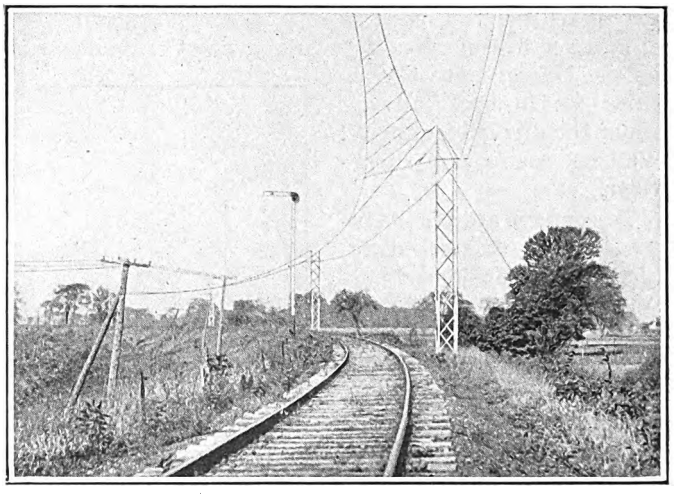
Standardized Overhead for the Canadian National Railways

Recently Electrified Grantham Division of the Niagara, St. Catharines & Toronto Railway Employs System Suitable for Various Voltages and Operation with Either Pantograph or Trolley Collectors

BY W. H. C. VILLIERS
Niagara, St. Catharines & Toronto Railway

DEVELOPMENT of a standard type of overhead construction which is susceptible of adaptation to other lines is an interesting feature of the recently electrified Grantham Division of the Niagara, St. Catharines & Toronto Railway, operation over which was begun some time ago. This line is part of the Canadian National Railways. The Grantham Division extends from Port Dalhousie, the terminus of the Welland Canal on Lake Ontario, to Merritton, the junction with the main line of the Canadian National, and is approximately 6 miles long. Comprised in the system of the Canadian National Railways are a number of electrified divisions, operating at d.c. voltages varying from 600 to 2,400, and also at 3,300 volts a.c. For this reason the standardization of types of construction, so far as possible, is of importance from economic and engineering standpoints.

In the preliminary study of the problems presented by its electrification the engineers in charge of the work, E. B. Walker, electrical engineer Canadian National Electric Railways, and R. L. Harrison, chief engineer Niagara, St. Catharines & Toronto Railway, exhaustively reviewed existing systems, with the object of developing an overhead construction which would combine their advantages to the greatest degree and at the same time be suitable for any of the voltages mentioned and meet the exigencies of trolley wheel or pantograph operation. The design of overhead construction finally evolved is the result of an analysis of the advantages



Armless Tower on 3-Deg. Curve

and disadvantages of the three principal types of construction, viz: (a) Wood poles with normal spacing; (b) light steel poles of various types with normal spacing; (c) heavy steel poles and steel bridge structures with long spacing. The design not only utilizes the good features of these systems, by combining the permanence of steel construction with the capital economy of wood poles, but it does so at an increase in cost over the latter of not more than 10 per cent.

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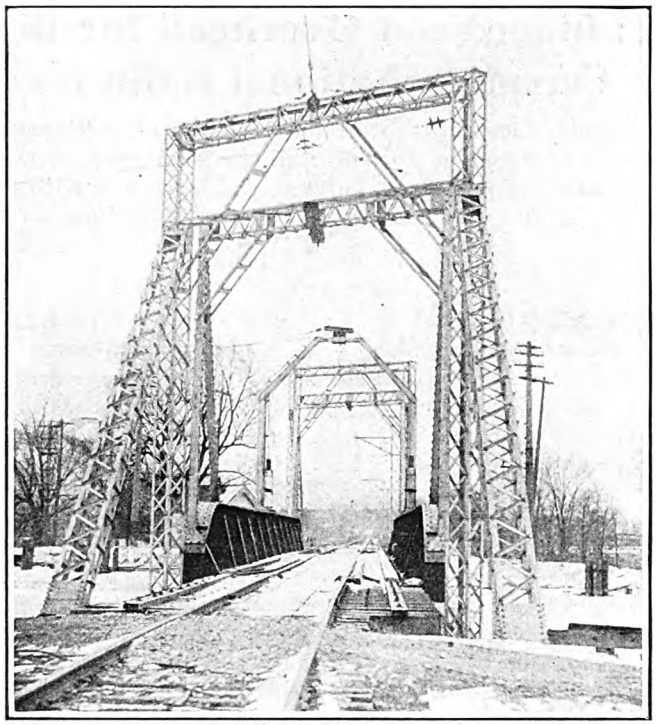


Overhead Structure at Welland Canal Swing Bridge

Standard Tangent and Armless Towers on Curve

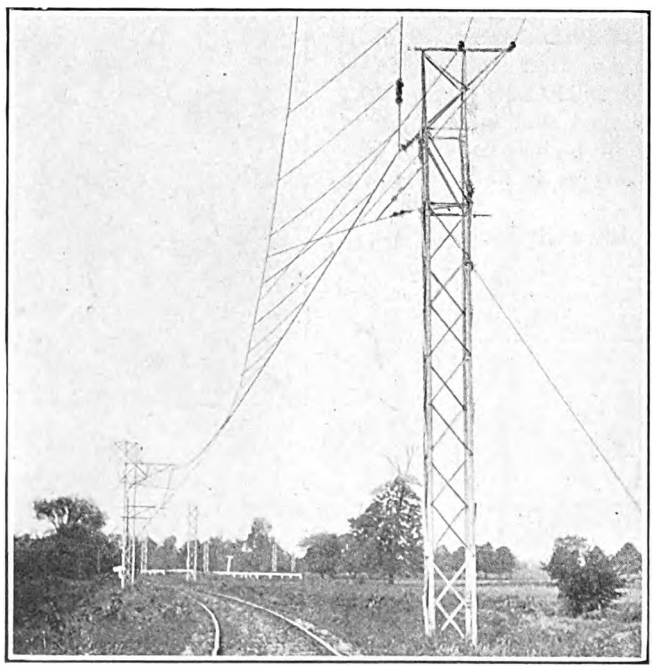
The standard tower evolved is built up of hot-galvanized standard angles forming a square column. Its height is approximately 25 ft. Various standard "heads" to suit the physical conditions of the track may be attached to the tower. A standard tower for tangent, towers with high-tension and telephone extension and armless towers used on curves are shown in accompanying illustrations. Provision is made for carrying high-tension and telephone-dispatching circuits.

Liberal loading allowances were made in calculating the towers and actual tests have shown a safety ratio of two to one. The towers were fabricated by the Canadian Bridge Company of Walkerville, Canada, and all are set in concrete, the work of erection being done by the Niagara, St. Catharines & Toronto Railway, under the direction of J. W. Walker, electrical supervisor.

To compensate for the increased cost of steel structures, it was considered possible, by carefully limiting the weight of the overhead system, to adopt a normal span of 330 ft. on tangents, with a maximum sag at normal temperatures of 6 ft. and a corresponding messenger tension of 3,600 lb. The operating voltage on the new division, uniformly with the remainder of the Niagara, St. Catharines & Toronto system, is 600 volts direct-current, and the trolley, which is standard No. 0000 grooved-section, hard-drawn copper, is suspended by means of special hangers from a specially made messenger consisting of a seven-strand steel core surrounded by two layers or 30 strands of aluminum, each strand being of 0.1261-in. diameter. This messenger wire, which weighs only 3,944 lb. per mile, provides a conductivity equivalent to 300,000 circ.mil of copper and has an elastic limit of 16,600 lb. per square inch and an ultimate strength of 22,000 lb. per square inch. While the span adopted is greater than usual, the low weight of the overhead system reduces the actual loadings to less than exists in many systems with less than 300 ft. spacing, and yet provides, with calculated maximum ice and wind loadings, a high factor of safety.

Considerable ingenuity was displayed by the engineers in adapting the existing swing bridge over the Welland Canal to electric operation. Special steel structures, built up from standard tower sections, were designed for this purpose; also special steel anchorages, of similar character, for the messenger, at each end of the bridge. Ohio Brass Company insulators and fittings are used.

Construction adopted on this division has proved so satisfactory, from considerations of cost, strength and appearance, that it has recently been installed on a 2-mile section of the Toronto suburban district of the Canadian National Electric Railways and also on a 10-mile extension of the electrification of the Montreal Tunnel, operated at 2,400 volts with multiple-unit cars.



Armless Tower with Vertical Extension

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Citizen vs. Street Railway

The Public Is Not a Mass but an Individual Raised to the *N*th Power, and Public Opinion Is Therefore Only a Greatly Enlarged Private Opinion—It Is Not Enough to Do Our Best, but the Public Must Be Told Our Story

By Ed Wolff
Hughes, Wolff & Company, Inc.

THIS case is now being argued in the Supreme court of public opinion. The attorney for the people is the motor car. In a desperately short time there promises to be handed down a verdict. It will be final. The street railway will be reinstated and rehabilitated or it will languish slowly into oblivion. What is the case for the prosecution?

It will be well first to draw a picture of the complainant. He is not "the public." There is no such thing as a composite public, which can be considered as an individual. For a quarter of a century my experience as an advertising man has brought me into contact with scores of public service corporations and big manufacturers and has taught me this one important fact—that the companies which succeed best in winning and holding friends among possible customers are those which have discovered that "the public" is not an entity, a homogeneous mass, but is a great group of individual men and women. The public is one man, or one woman, multipled to the *n*th power. As soon as the heads of a mighty business learn that the consumer is just one person, duplicated over and over, things take a turn for the better. Our complainant, then, is Pete Harris, of Any Street, Everywhere. As parties to the suit he has behind him several millions of other men and women, but, essentially, our antagonist is Pete Harris. Win him over and we have won over all of his kind and breed. Let us see what has happened to Pete Harris recently on the street car.

In Milwaukee, last February, Pete Harris's mother was on a Downer Avenue car. I happened to be there myself. She is not an attractive woman any more. Her age is all of 65. Her face is lined and wrinkled, the skin is sallow, the eyes dull. Her clothes are old and faded. Stupid, unseeing and slow, she is, frankly, enough to irritate the average man who might transact business with her. So when the car had started again and she said to the conductor, from half way down the aisle, "I wanted to get off here," he could not be expected to stop the car midway of the block. And when he retorted, "Well, lady, why didn't you ring the bell? I'm a conductor, not a mind reader," one may hardly blame him too harshly.

But when that old lady tells her son Pete about it that night and pictures how her dignity and pride were humbled by the conductor in front of 20 or 30 people, Pete becomes hotly indignant. With all her shortcomings, that woman is Pete's mother. She was in no position to engage in a verbal battle with the conductor before a strange audience. Maybe her breeding as a lady would not have permitted it. Be that as it may, the assailant of Pete's mother wore the uniform of the traction company, and so far as Pete is concerned it is the company which has insulted his aged parent. Does Pete explain to her that the company tells its men to be courteous, that it has no intention of allowing its employees to offend its patrons? Pete does not. Pete doesn't even know whether this is true.

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Rube Goldberg's Idea of Street Car Etiquette as Displayed in a Collier Car Card

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What he does know is that a duly authorized agent of the corporation has made his mother cry in bitter grief. And Pete is mad about it.

Meanwhile some dozen or so other men, who also have mothers, or wives, or sweethearts, make mental note of the occurrence which developed before their eyes. In imagination they see their dear ones undergoing the same indignity. Immediately, without an effort on his part, Pete has these men ranked solidly behind him in his suit—Citizen vs. Street Railway. They are witnesses for the prosecution as well as co-prosecutors.

Later I met another member of Pete's family on a Market Street car in Chattanooga. It was his wife. She is a buxom, fairly good-looking woman; not overly-refined or educated, but a typical American woman of the middle class. When she paid her fare I heard her ask the conductor to put her off where she could catch a Signal Mountain car. By the time we neared Lookout Mountain, and were a mile or two from her connecting point, she reminded him of it. He said: "Lady, you passed it long ago.."

"But I told you to put me off there."

"I called it out. Why didn't you listen?"

"Why didn't you call me? I sat right near you purposely. I'm a stranger here. Give me a transfer back."

"I can't do that."

"Well, I'll stay in the car and you can carry me back."

"All right. But you'll have to pay your fare again."

"I guess not. Why should I?"

"Lady, this car has to go ahead. Are you going to stay on or get off?"

Pete's wife got off. Some silly school girls across the aisle had the poor sense to giggle about it. She heard. Her face flushed. No doubt she told Pete about it when she got back home. Did Pete tell her that it was her fault? Did he explain that conductors are bound by rules that they cannot overstep? He did not. Remember, this is Pete's wife. He loves her above all women of the earth, except perhaps his mother in Milwaukee. What does he do? Being human, he chalks down another score against the traction company.

And again some dozen or so men line themselves up with Pete. The number of parties to the prosecution grows.

Pete ruminates over these things and they burn inside of him. Then he gets off from work that night tired and hungry. It is raining—a leisurely, sloppy rain. His clothes are wet, his shoes are wet, his temper is wet. He waits, and he waits. The longer he waits the madder he grows. The knot of people who are waiting with him grows and grows. Somebody makes a clever remark about the service. Some laugh. Some, like Pete, grit their teeth and swear under their breath. Finally the car looms into sight.

It is packed tight. Human ingenuity could not get another person into that car, even if human endurance could tolerate the pressure. The motorman, already behind schedule and knowing the condition of the interior, has no time to stop and explain; still less to lose more precious seconds by stopping at all. He sails majestically by the waiting group. Three voices are lifted in imprecation—one sarcastically, one profanely. One says: "We ought to have buses on this line." The suggestion goes unanswered, but everybody thinks.

Another car is right behind. "Fine service," growls a man. A confused murmum of agreement comes from the group. They push into the car, already uncomfortably full due to the unexpected rain. The conductor yells, as I heard him yell in Rochester last week: "Step back there! Plenty of room in the back. What do you want to act like cattle for and crowd up in the front? Step back, I tell you. Step back!"

Pete steps back, but his fists are clenched and his lips are white. There is no more room in back than there was in front. But moving back did leave a little more space in front to jam a few more people into at the next stop. Pete notes this, but says nothing.

Leaving Pete for a moment to fume and stew by himself, let me remark that I have been publicity counsel and advertising agent for more than one public service corporation, including street railways. Neither for myself nor for readers of ELECTRIC RAILWAY JOURNAL do I need to repeat the points in the case for the defendant. I know, as you know, the instructions given to the car crew. I know what happens to schedules and the thousand and one things that "the public" is and does. But what you know and I know does not count. What we're standing trial for today is what Pete Harris knows, or thinks he knows.

Pete Harris is complainant and tells his story as he sees it. And behind Pete Harris stand several hundred thousand, or million, other Pete Harrises, ready to testify in his behalf before the jury. And the jury is composed of twelve Pete Harrises? Or twelve million. Where's our case?

Witnesses for the defendant having testified, the most able and representative is cross-questioned:

Q. What do you think is needed to revive traction patronage?

A. Better-looking cars—more architectural and artistic.

Q. Millions of people are riding in rusty and dirty motor cars, aren't they? Cars without art or beauty?

A. Yes.

Q. Those people, lots of them, live in decidedly inartistic homes, don't they?

A. Yes.

Q. Argument invalid. Any other thing?

A. Yes. Street railway cars should make less noise.

Q. Well, why don't they?

A. The car builders don't make them.

Q. If you refused to buy noisy cars, as the public refuses to ride in them, the car builders would make them, wouldn't they?

A. Have to, I suppose.

Q. Do you employ engineers?

A. Do we—say, what do you think we're running? A fruit stand? Of course we em———

Q. Don't they know that noise means friction, and wear, and expense?

A. Yes.

Q. Well, then, why don't they show you what noisy cars mean to you in loss and expense, even regardless of the public?

A. I refuse to answer such a silly question.

Q. Never mind. The public and the motor car makers are answering it for you. What steps does your company take to make friends with the public.

A. Make friends with the public? Why, I never heard of such a thing. Doesn't the public need us?

Q. That's a question nowadays. Tell me, do you advertise?

A. Advertise! For what? Haven't we got the business now?

Q. You used to have. Have you got the public's good will?

A. Well, no.

Q. Isn't that what's wrong with your business?

A. Perhaps.

Q. If the public understood all your problems wouldn't it be more reasonable?

A. No.

Q. Why not?

A. Well, people are ignorant.

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Q. Of course. But if you explained your side of the case through the columns of the daily press, as other business men do, wouldn't the public come out of its ignorance? Wouldn't it know what it doesn't know now? And who is going to teach it those facts if your company doesn't? You're excused.

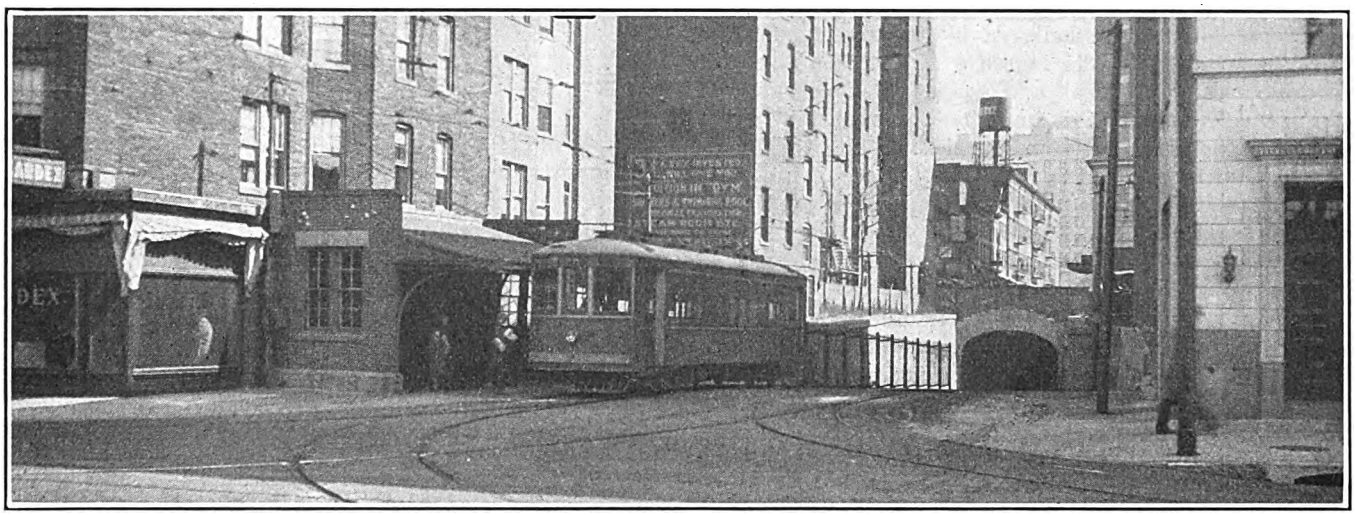
The fact is that the experiment has been tried. Some eleven years ago in San Antonio, Tex., I arranged with Vice-President Tuttle and his co-worker, E. E. Eysenstein, to put on a newspaper campaign for the traction company. We took the public into our confidence. We told how much it was costing to lay new tracks; the percentage of fares received that went into new equipment, operating expenses, damage suits, and so on. We were frank, open and honest. We appealed, in a dignified way, for public support on the basis of honest intent to render worthy public service. It would require too much space to detail the various benefits that were apparent in even so short a time as one year, but the most noteworthy was a reduction of about one-third, as I recall it now, in the amounts of the damage suits filed against the company.

Now, what are we going to do with Pete Harris? Are we going to let him curse and rave and swear at us in the future as he has done in the past, until the motor car makers calmly take over our business with Pete's consent, or are we going to find out just what ails Pete, try our level best to give him what he reasonably wants and is entitled to?

Are we going to let Pete sit in sullen silence, while we sit in sullen silence, blaming each other in ignorance of our reciprocal need? Are we going to make an active effort to save Pete as a friend and patron or are we going to continue to tell him to "go to ———," Detroit, where motor cars are made?

Traffic Increased by Use of New Cars

Modernization of Rolling Stock of the Morris County Traction Company Has Attracted Additional Riding and Reduced Operating Expenses — Taxes and Paving Charges Amounting to 18 per Cent of Gross Receipts Endanger Continuance of Railway Service



Through Service Between Morristown and Newark Has Been Established by the Morris County Traction Company
A Morris County car is here seen emerging at the western end of the Public Service Railway subway. Public Service terminal is seen in the background

IMPROVEMENT in the local transportation service in Morris County, New Jersey, has resulted during the past several years from the modernization of the rolling stock of the Morris County Traction Company. This has brought about a gratifying increase in the number of passengers carried by the railway and a reduction in operating expense to 25.23 cents per car-mile. An unfortunate combination of taxes and paving obligations, however, places such a heavy burden on the company that its operation is unprofitable.

In April, 1920, fifteen single-truck Birney safety cars were first placed in regular operation. Prior to that time, the railway had a number of old wooden cars which have now been largely retired from service, and also some comparatively modern double-truck two-man cars with steel bodies. Disadvantages of the latter type of car were their weight and the need of a two-man crew. Modifications in the design were made at a later date, so that by April 15, 1923, it was possible to inaugurate complete one-man operation of all cars. In September, 1924, ten light-weight double-truck safety cars were bought from the Osgood-Bradley Car Company and placed in service.

Among the savings resulting from the operation of more modern equipment has been a substantial reduction in energy consumption. Comparative figures for various types of cars are given in the table below. The average speed is 11.42 m.p.h.

ENERGY CONSUMPTION PER CAR-MILE

Six old-type double-truck cars	3.0 kw.-hr.
Thirteen double-truck steel cars	2.6 kw.-hr.
Fifteen single-truck Birney cars	0.9 kw.-hr.
Ten light-weight double-truck cars	1.7 kw.-hr.

Other expenses of operation have been similarly reduced, so that the present cost per car-mile is 25.23 cents as against 28.77 cents in 1922. Distribution of these costs among the various operating accounts is given in the table on page 764.

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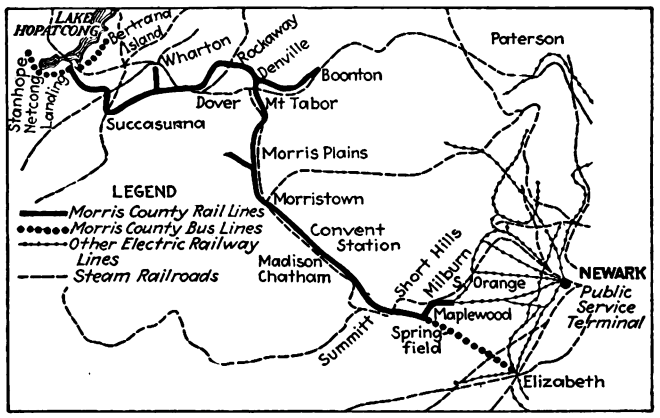
The total number of passengers carried increased in 1924 over the preceding year and again in 1925 over 1924, the total for last year being 7,891,942, which is the largest in the history of the company. An interesting and gratifying change has occurred in the riding habit, so that the traffic is now considerably more uniform throughout the year than was formerly the case. This is shown graphically in an accompanying



Car Lines of the Morris County Traction Company Connect All the Principal Towns in Morris County and Connect with Public Service Railway Lines in Elizabeth and Newark

chart, giving a comparison of passengers carried by months from 1922 to 1925 inclusive.

Several factors are believed by the management to have contributed to the increase in traffic. The comfortable riding qualities and attractive appearance of the new cars undoubtedly have had an important effect. Through operation between Morristown and the Public Service Railway Terminal, Newark, a second factor of importance in building up traffic commenced on Dec. 6, 1925, as told in ELECTRIC RAILWAY JOURNAL for Dec. 12. This eliminated the necessity of changing cars at Maplewood, where the tracks of the two companies join. Growth of the residential communities in Morris County is another element which has aided traffic.

Through operation between Morristown and Newark involved several problems of fare collection. Morris County cars are operated by their own trainmen over the tracks of the Public Service Railway. It was stipulated in the agreement, however, that this service should be available to local passengers between Maplewood and Newark on the same basis as that given by Public Service cars. Fare collection on the Morris County cars is on the pay-leave plan in both directions. Each passenger, except those boarding in the initial zone, receives an identification check. These are different for the different zones and enable the operator to determine how much fare should be paid when the passenger leaves the car. The area of operation over Public Service tracks is treated as two additional zones of the Morris County line, but the fare charged is that of the first-named company.

Morris County fares are 7 cents per zone, having been increased in May, 1918, from the previous rate of 6 cents. That rate, in turn, had been increased in November, 1917, from the original 5-cent fare. The average length of fare zone on the main line is 3.94 miles, while the average length for the entire system, including branches, is 3.72 miles.

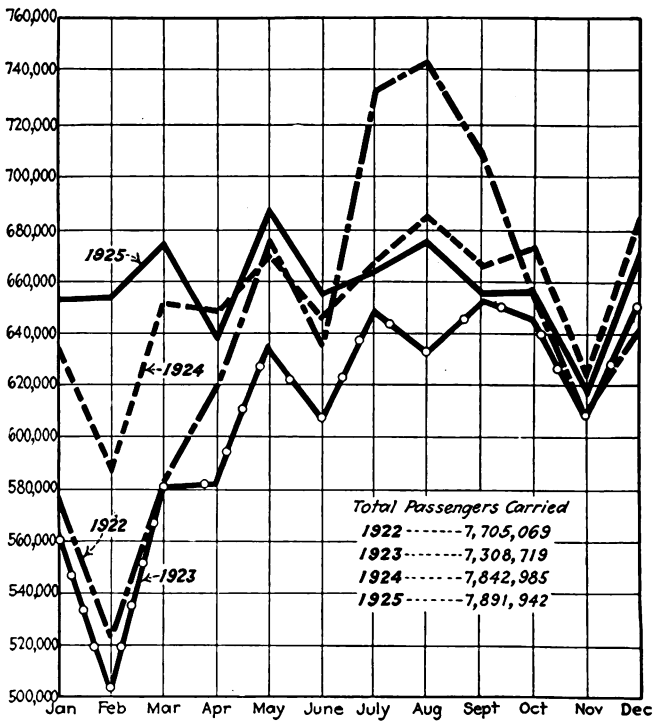
Bus operation has been undertaken by the railway on three lines. Beginning in May, 1925, service was commenced on a line 3 miles in length from the railway terminal at Landing to Netcong and Stanhope, and on

COSTS OF OPERATION, MORRIS COUNTY TRACTION COMPANY, 1922-1925

	Cents per Car-Mile			
	1922	1923	1924	1925
Maintenance of way and structures	5.46	5.00	4.54	4.50
Maintenance of equipment	2.80	2.28	2.80	2.80
Power	6.47	6.01	5.10	5.19
Conducting transportation	8.87	8.94	8.38	8.01
Traffic	0.02	0.10	0.08	0.05
General and miscellaneous	5.15	4.81	4.77	4.68
	28.77	27.65	25.76	25.23

a second line 1 mile in length from the same terminal to Bertrand Island. The fare from Landing to Stanhope is 20 cents and the fare from Landing to Bertrand Island is 10 cents. Prior to 1916 the Morris County Traction Company operated from May 30 to Sept. 4 each year from Landing to Bertrand Island over the tracks of the Lackawanna Railroad for a distance of 3,800 ft. This operation was discontinued during the war, due to heavy freight traffic serving a munitions plant on this line of the steam railroad, and was not resumed thereafter. The bus route to Netcong and Stanhope is new. Substitution of buses in place of cars on the branch from Springfield to Elizabeth was made recently to avoid expensive track repairs.

Despite the favorable results which have accrued to the railway from the modernization of equipment, the present financial situation is serious due to extremely heavy tax and paving burdens. In 1925 the franchise and gross receipts taxes paid by the company amounted to 8.728 per cent of its total gross revenue. In addition, taxes locally assessed on rights-of-way, real estate and buildings made the total in excess of 9 per cent of the gross receipts. Paving obligations have amounted to approximately 9 per cent of the gross, making the total



Comparison of Passengers Carried by Months, 1922-1925

obligations of this character more than 18 per cent of the revenue.

Of the total mileage of the company, 15.43 is on private right-of-way, 10.65 alongside of paved streets and 22.56 in paved streets. Snow removal on the paved streets is done by the railway. Counties, towns and the state are supposed to remove the snow from the sides of the streets, but in actual practice

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it is often found that only the space cleared by the railway is available for traffic. Concentration of all traffic on the pavement in this small area wears it out rapidly.

Acting on the complaint of numerous automobile drivers, the State Highway Commission recently applied to the Attorney-General of New Jersey for forfeiture of charter of the Morris County Traction Company on account of failure to perform its paving obligations. An unusual legal situation is thus presented because the company is at present in the hands of receivers, appointed by a United States court.

Paving Obligations Prove Heavy Burden

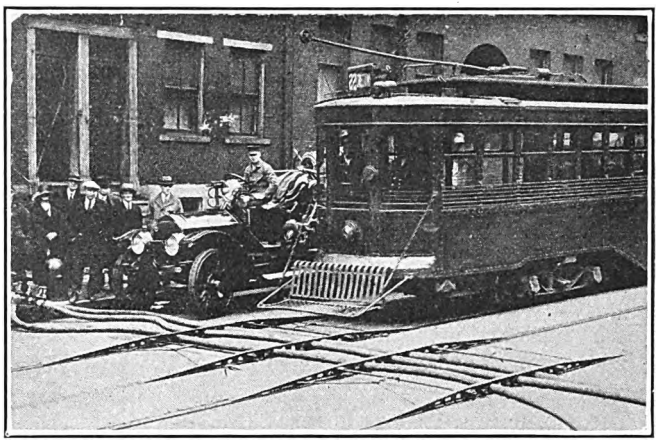
The receivership dates from July 23, 1923, and was the outcome of refusal of a minority interest to agree to a refinancing plan. In 1918, the earnings being insufficient to meet the full interest charges on the bonds, the bondholders agreed for a period of five years to exchange the 5 per cent coupons on their bonds for new coupons at 2 per cent and an income trust certificate to cover the difference. Under the trust agreement the 3 per cent coupons attached to the income trust certificates were automatically canceled each year if the earnings were insufficient to permit payment. During the following five years the 2 per cent coupons were regularly met and the income trust certificate coupons were canceled. Before the expiration of this agreement in 1923 a refinancing plan was submitted to the bondholders. According to this plan they were to accept new bonds at 6 per cent for half of their holdings and non-cumulative preferred stock for the other half. Execution of this plan required the consent of all the bondholders. Unfortunately, three individuals out of a total of 286, representing only 3.13 per cent of the bonds, refused to deposit their holdings for exchange and the refinancing plan could not be undertaken.

When the original paving agreements were made, macadam paving was in general use throughout the territory in which this company operates, and it was stipulated that the paving work done by this railway should be of this type. In recent years, however, heavier pavements have come into use and an attempt has been made to have the railway install these more expensive kinds. To this the company has objected. As a solution of this difficult problem a bill was introduced in the New Jersey Legislature to relieve street railways in part of their paving obligations. Although passed by the Senate and General Assembly, this bill was vetoed by the Governor and the question reverts to its original status.

Substitution of buses for cars has been considered as a possible remedy for the situation. While this might be advantageous on certain branch lines, it is not thought by the management to be a sound economic arrangement for the main line. Operating expenses, on account of the modernization of equipment, are well within the revenue, and the financial difficulties are entirely the result of the heavy taxation and paving obligations. While it might be possible to eliminate some of the latter by substituting buses for cars, this would simply shift the paving burden to the municipality. It is believed to be a better plan to make such a shift by legal means and to continue the operation of cars, which, it is stated by the management, can provide the necessary transportation service more economically than it would be possible to do it with buses.

Hose Bridges Adopted in Pittsburgh

TESTS were recently conducted by the Pittsburgh Railways in collaboration with Chief Richard Smith of the city fire department and Ben Marshall, city traffic engineer, to determine the desirability of using hose bridges to prevent tie-ups of street car traffic by fires. An accompanying illustration shows the



Simulating Actual Emergency Conditions During Tests of Hose Bridges in Pittsburgh

carrying out of these tests under circumstances as nearly as possible approaching actual emergency conditions. The results were so satisfactory that hose bridges have been made part of the regular equipment of emergency trucks of the railway. The type used in Pittsburgh were supplied by the Ohio Brass Company.

Bus Discussion in the "National Municipal Review"

RELATIONS between the bus and other forms of transportation was the subject of an article by Walter Jackson, consultant, Mount Vernon, N. Y., appearing in the *National Municipal Review* for April. Economic aspects of bus service as a substitute for electric railway service were discussed. The value of co-ordination was brought out, but it was stated that mere "alternation" of cars and buses should not be confused with "co-ordination." Possibilities of de luxe service and the present interstate bus situation also were touched upon.

Co-operation Between Hotel System and Electric Railway

AN EXAMPLE of co-operation between hotel management and electric railway services is noted in the time-table schedule of electric railway services in and out of Fort Wayne as shown in the booklet of the Keenan Hotel System. An interesting sixteen-page pamphlet has been issued as an invitation to salesmen to talk over their problems at the Anthony Hotel or the Keenan Hotel in Fort Wayne, and if they must travel it directs them to new territories. For this purpose two traction time cards are provided which cover all traction lines in and out of Fort Wayne. Steam schedules can be obtained in the lobby of the hotel. These schedules, together with the map in the center of the booklet, should furnish the traveler a fund of information from which to work out the most advantageous schedule for his particular destinations.

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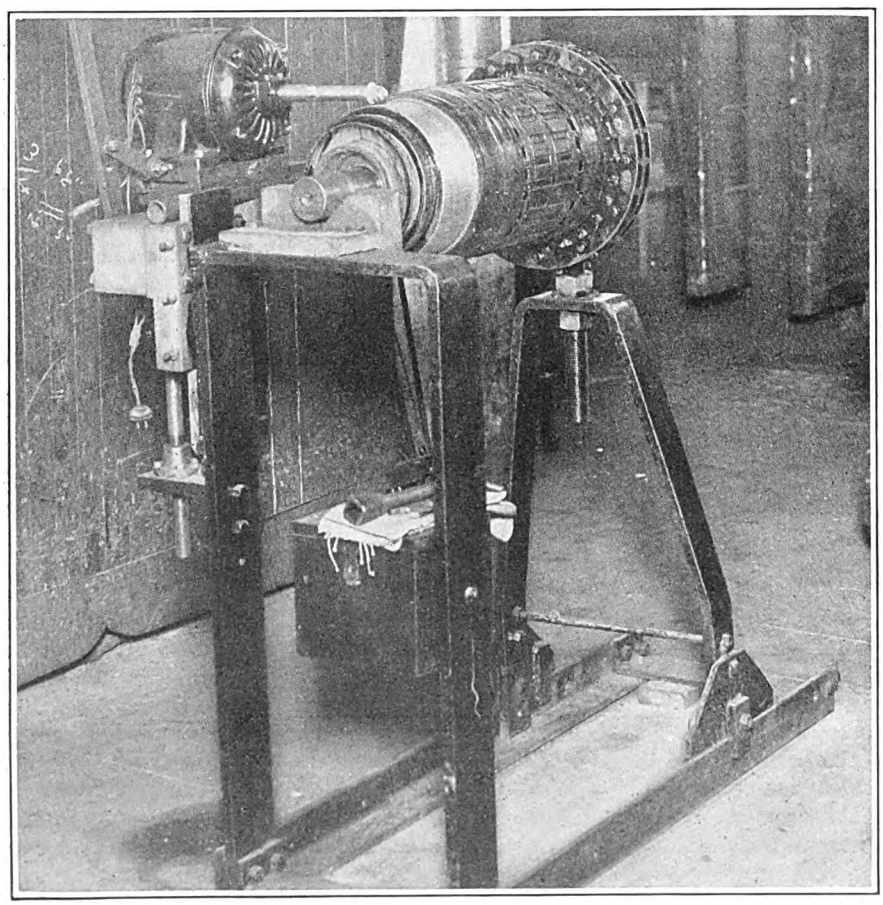
Maintenance Notes

Convenient Commutator Slotter

IN THE Atlanta shops of the Georgia Railway & Power Company is a home-made commutator slotter which has proved very convenient and useful. It is shown in the accompanying illustration. Power for the slotting saw is provided by a ¼-hp., 110-volt, single-phase motor, which has an armature speed of 1,120 r.p.m. The saw is carried on an extended arbor.

The motor is raised or lowered by means of the vertical screw shown attached to the left upright of the frame. The sliding carriage for raising and lowering the motor is provided with adjusting screws to take up lateral wear, both guides being renewable. The horizontal feed of the motor is obtained through moving the carriage the length of its cut by means of the lever shown at the left. The motor is also mounted on a pivot, making it possible to slot commutators which are slightly skewed.

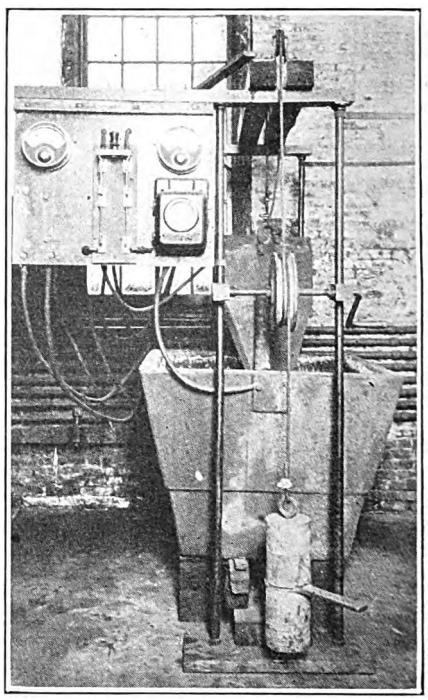
The block supporting the commutator end of the armature shaft is always at the same height, but the upright which holds the pinion end of the armature shaft is adjustable to care for various heights and lengths of armature.



This Commutator Slotter Is Rapid and Adjustable to All Sizes of Armatures

Water Rheostat Test for Gas-Electric Buses

FINER load adjustment is possible with the water rheostat test now being used by the Philadelphia Rural Transit Company to determine the power plant efficiency of gas-electric buses than may be attained with the grid type of rheostat commonly used in dynamometer testing equipment. Each garage and the mechanical and electrical laboratories of the company are now being equipped with these rheostats, which consist of the following units:



A Cast-Iron Receptacle with Salt or Soda Solution Is Used for Rheostat

A cast-iron receptacle holding about 55 gal. of salt or soda solution, a balanced electrode weighing about 25 to 30 lb., necessary pulleys and rope for same, a wood instrument board having mounted thereon a 600-watt G.E. ammeter, one 600-volt G.E. voltmeter, one watt-hour meter, one 250-amp., double-pole knife switch, necessary terminals, meter wiring and 75 ft. of No. 00 heavy insulated lead wires.

Referring to the accompanying wiring diagram, the procedure of testing is as follows: The terminals marked *A* are connected to a junction block provided for this purpose on the left-hand side of the chassis, the engine is then started and a load of 200 to 400 amp. is transmitted to the generator through the manual operation of the electrode *B* coming in contact with the salt or soda solution in the cast-iron receptacle *C*. The area of contact between the electrode and the liquid entirely controls the resistance applied to the generator.

On each test the engine r.p.m. is at its maximum and during such time the radiator water tempera-

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tures are recorded. The thermal efficiency of the sleeve valve engine, the type of which is being used in conjunction with the G.E. 25-kw. type generator, is about 85 deg. C.

The following is a sample of test made on two buses. The first bus, No. 278, was found to be efficient and the second, No. 512, inefficient. Each of these tests, as listed in the table below, was made before inspection.

From the above data it will be seen that there is a vast difference in the output of these two vehicles, and therefore, in order to preserve the life of the power unit so that the gas and oil consumption may be brought down to its lowest figure, buses similar to No. 512 must be checked and remedied. The advantage of a water rheostat test is that only power plants showing marked inefficiencies need be torn down for repair.

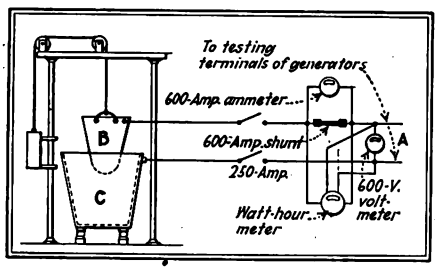


Diagram of Connections Between Switchboard and Liquid Rheostat

A copy of the foregoing test is handed to the garage foreman before an inspection of the vehicle is started, and when a bus has the same performance as No. 512 the foreman will make a personal inspection of the power plant of this bus in order to determine the method to be employed in overcoming this discrepancy.

Records are kept of the complete performance data on each bus so that when a defect of any nature is reported, either in operation or otherwise, the same may be checked for repetition.

In addition to the conventional service in checking bus power plants the Philadelphia Rural Transit officials have found the rheostat beneficial in many ways, such as testing newly developed features for added economy, checking gasoline consumption, timing, etc. In fleet operation of gas-electric buses water rheostats of the character described play an important part in reducing maintenance costs to the minimum and reducing trouble in operation.

Temperature of day, 26 deg. C.

Bus	Date	Amperes	Volts	R.p.m.	Water Temperature	Remarks
278	9-3-25	200	206	1,385	70	Wide open throttle
		300	118	1,070	75	
		400	77	1,010	85	
Kilowatt-hours per gallon of gasoline, 5.35.						
512	9-3-25	200	167	1,165	56	Wide open throttle
		300	96	1,115	60	
		400	64	875	70	
Kilowatt-hours per gallon of gasoline, 4.52.						

Carborundum Track Brakes

TESTS have been made on a few street railway lines in Europe, including those at Zurich and Basle, with track brakes having a braking surface of carborundum. Two shoes on each side of the car are attached to the truck frame of the single-truck car and are pressed down on the track by air. No sand is required to secure a quick stop. This type of brake is recommended for emergency use only, because it produces considerable wear on the head of the rail.

Plate Glass Chip Guard Used in Detroit

MANY safeguards are used in the shops of the Department of Street Railways, Detroit, Mich. The view shows a simple plate glass guard mounted in a wood frame and arranged in an adjustable holder to fit over the tool clamp of a lathe. Good vision can be gained at the same time, eliminating the possibilities of chips flying into the operator's face.

In time the steel chips flying against the glass guard scratch the surface. The glass is so small that its replacement is simple when its condition hampers clear vision.

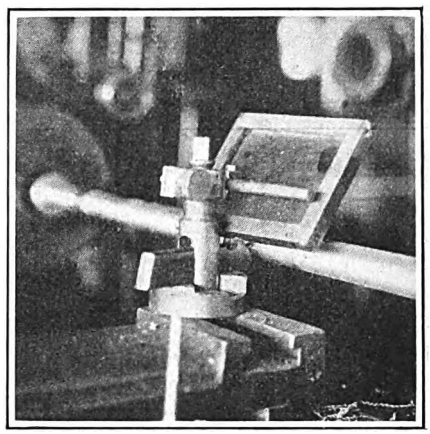
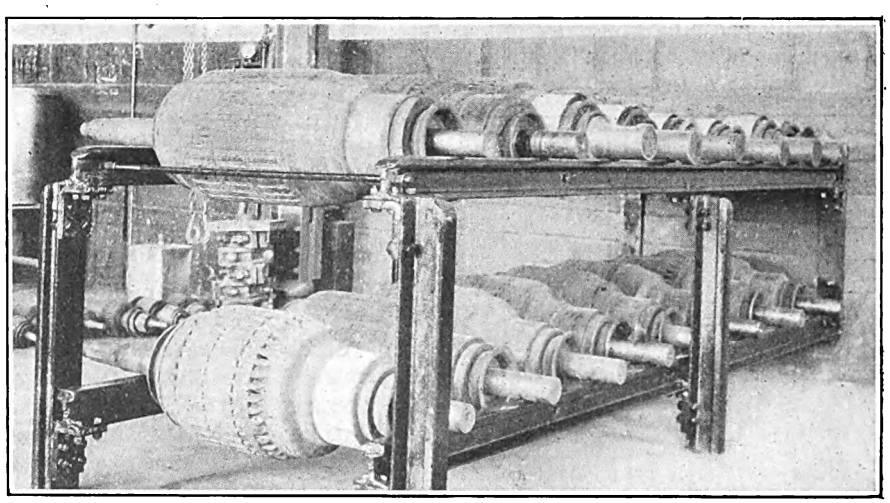


Plate Glass Protects Operator from Flying Chips

Attractive Armature Rack Made from Old Rails

DOUBLE-DECK armature racks of the type shown in the accompanying illustration, two in number, are used for storage of armatures in the electrical department of the shops of the Erie Railways, Erie, Pa. The upright and horizontal supports for these racks are made of discarded T-rails. The uprights are set in the concrete shop floor and the horizontal members are bolted to these through angle supports at each upright. The racks provide capacity for sixteen armatures. They are 4 ft. high and 12 ft. long. The width of the rack is made sufficient to accommodate the longest type armature used. In placing smaller sized armatures in the rack, which have shafts so short that they will not extend the full width, a pipe is applied over the shafts, at the pinion end, to give the necessary extension.



Armature Racks Made of Discarded Rails as Used in the Shops of the Erie Railway

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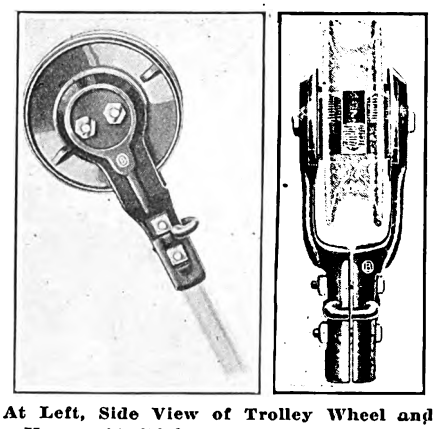
New Equipment Available

Trolley Wheel and Harp

EXCLUSIVE manufacture and sale of a special trolley wheel and harp made under licensed patent owned by T. M. Feist, master mechanic Sioux City Service Company, Sioux City, Iowa, has been taken over by the Ohio Brass Company, Mansfield, Ohio.

The wheel has been adopted as standard on a number of street railway properties and some 1,500 are at present in use. Features of the device are the large axle, providing a considerable bearing area and containing graphite slugs which are pressed outwardly by springs against the bearings of the wheel to provide lubrication. By virtue of this large bearing and special type of lubrication, mileages on the wheels are obtained which average considerably more than the life of the ordinary wheel, according to records kept on a number of properties.

A split harp is used and is fastened to the axle by means of two bolts extending through the axle. This tight clamping of the large machined surfaces between harp and axle provides a low resistance path



At Left, Side View of Trolley Wheel and Harp. At Right, Ample Bearing Area Makes Current Collection Easy

for the current, giving unusually large current collecting capacity without the use of a shunt. It is a feature of this device that it is unnecessary for a carhouse man to lubricate the wheel, as it is claimed that these units will average more than 15,000 miles without any lubrication attention.

Other features of the wheel are the shape of groove used and the particular composition of the metal, which gives an exceptionally tough wheel and contributes materially to the long life obtained. The manufacturer claims that trolley wheel expense can be cut to one-third by using this device. For the past three years the device has been marketed by the Dayton Manufacturing Company, which also manufactures other devices under patents of Mr. Feist.

Overload Relay Is Redesigned

REDESIGN of the temperature overload relay manufactured by the General Electric Company, Schenectady, N. Y., has been made. This relay has two heating elements connected in each two phases, so that complete protection is provided for single, two or three-phase motors. On direct current circuits the heating elements are connected on each side of the line.

The improved relay is known as the form C or PC-121-C. The improvements in design allow the use of renewable heating elements, prevent the bending of thermostatic strips by operators and include a better mechanical construction. The relay is reset by means of a cord and button suspended from the bottom.

Brass Cups for Traffic Markers

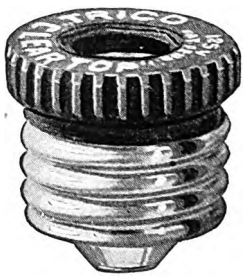
MARKINGS which will not corrode nor soon wear away have been developed recently by the Bridgeport Brass Company, Bridgeport, Conn., in the form of brass cups to be inserted in pavements where traffic directions are needed. The new traffic spots are made in two diameters, 3 in. for pedestrian lanes and markings and 4½ in. for traffic divisional lines. They are claimed by the makers to be highly visible, easily inserted and requiring no upkeep. They may be inserted in asphalt, macadam, wood block pavement, Amasite, Warrentite and new concrete pavements.

Once the layout for any particular marking is made, the insertion in the pavement is accomplished by pounding with a flat-faced cast-iron road tamper. Another method which is considerably faster is to lay down the spots where marked and run a steam roller over them.

The new traffic spots are particularly recommended by their manufacturers for use in such markings as street car safety zones, school stops, on dangerous curves and in substitutions for police officers where traffic is light.

Improved Features in Plug Fuse

SEVERAL distinctive features are incorporated in a new non-renewable plug fuse recently placed on the market by the Trico Fuse Manufacturing Company, Milwaukee, Wis., under the trade name of "Cleartop." The fuse consists of a separate porcelain base and body. The base has a long baffle chamber which extends to the inside top of



Body of This Non-Renewable Fuse Is Treated Porcelain, with a Rugged Knurl to Give a Good Gripping Surface

the body and holds the mica window in place. The body and base are held together by a heavy brass screw shell. The body is finished in a dull black, giving the appearance of molded insulation.

Some of the distinctive features are provision of a large rugged knurl around the top edge to afford a good grip when tightening. The fusible strip is made from accurate material and has a restricted blowing portion; each strip has the rated current stamped plainly on the top and is visible through the mica window. The screw shell is made of heavy-gage hard brass, threaded completely. It is rigidly fastened to the body and cannot become loose. The lower end or fusible strip is securely soldered to the bottom contact. The other end is soldered at the base of the screw shell. A vent space is provided around the base so that the gases escape along the exterior of the base within the body and are gradually released along the base. The body and base are molded from a high grade of porcelain. The base supports the mica disk as well as the fuse strip and acts as a fireproof barrier to prevent interior flashovers. A large center contact is riveted to the base.

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Association News & Discussions

Welding of Pipe and Pressure Vessels Discussed by Welding Society

WELDING practice as used by electric railways did not form a particular part of the discussion at the annual meeting of the American Welding Society, held April 21-23, in the Engineering Societies Building, New York City. There were, however, several contributions dealing with practical welding problems, particularly relating to piping installations and pressure vessels. Other features were a review of the progress in gas and arc welding, a general symposium on the subject of design, and an inspection trip to the plant of the Metals & Thermit Corporation. There was considerable discussion of research problems in the session devoted to the American Bureau of Welding, and a dinner-dance was preceded by spectacular demonstrations of the properties of liquid oxygen.

New officers for the ensuing year were elected as follows:

F. M. Farmer, president; E. M. T. Ryder, first vice-president; R. L. Brown, A. M. Candy and Stuart Plumley, divisional vice-presidents; C. A. Adams, H. M. Hobart, A. E. Gaynor and A. G. Bissell, directors at large.

On Wednesday morning there was held a well-attended meeting of the gas welding committee, of which S. W. Miller, head of the research laboratory of the Union Carbide & Carbon Corporation, is chairman.

At Mr. Miller's invitation, F. R. Low and C. W. Obert, chairman and secretary respectively of the A.S.M.E. boiler code committee, spoke briefly on the "Unfired Pressure Vessel Code" and the attitude of the code committee on welding. It was pointed out that the committee has no actual authority in matters of construction. Its function was rather to crystallize and codify the best existing practice.

A report from the San Francisco section outlined the preliminary program for research on the strength of welds at high temperatures. This work, in which Leland Stanford University and the University of California are cooperating, will be limited at the start to welds made with commercial welding rods of ordinary firebox steel.

The main feature of the meeting of the electric arc welding committee was a discussion of the results of tests made to determine the effect of such factors as current, size of electrodes, design of joints, positions of welding, etc., as presented by the sub-committee on the fundamentals of arc welding.

This was preceded by a report of the sub-committee on non-ferrous metals. One member reported success in welding aluminum with the electric arc. Another told of the Niagara Power Company's practice in the matter of repairing eroded impellers of hydraulic turbines. These are renewed by arc welding with phosphor-bronze rods.

In a discussion of single-V versus double-V welds (in steel plate) several spoke in favor of the single-V weld as ample for many purposes. Samples were shown of square-end and single-V welds made with a grooved copper backing plate to give excess metal on the back side. The results of tests to determine the effects of size of electrodes, design of joints and other factors on the properties of electric arc welds were presented by H. L. Warner, General Electric Company. There was some disagreement as to the interpretation of the results obtained.

At the Thursday afternoon session S. W. Miller of the Union Carbide & Carbon Research Laboratories, presented a paper on the "Design of Welded Joints with Special Reference to Pressure Vessels," while L. H. Burkhart illustrated design methods by the details of design and manufacture of a welded pressure vessel to meet specific requirements.

The annual meeting of the American Bureau of Welding, which is the research department of the society, took place Friday morning, April 23. Prof. C. A. Adams stressed the importance of fundamental research in the welding field. Some fundamental problems needing investigation in the electric-arc, gas-welding pressure-vessels and structural welding field were outlined.

Two important investigations are being proposed; one in the field of unfired pressure vessels as a joint investigation with the A.S.M.E. to secure information needed by the boiler code committee and designing engineers. The other investigation is being proposed in the field of fabrication of structural steel, in which co-operation is being sought from the American Institute of Steel Construction.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 6—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass. 3.30 p.m. and 6.15 p.m.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

May 13—Central Electric Railway Master Mechanics' Association, Orlando Hotel, Decatur, Ill.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Central Electric Penny Coupon Tickets Considered

CERTAIN lines have signified a desire to become party to joint passenger tariff No. 37 of the Central Electric Traffic Association covering the interchangeable 2,000 penny coupon ticket. It was decided at the meeting of the association held on April 21 that before reissuing the tariff an opportunity be given all lines in the association to participate therein if they so desire.

Lines now party to the tariff will be carried forward in the reissue on the same basis as in the present tariff unless advised to the contrary. Lines not party to the tariff are requested to advise Secretary L. E. Earlywine at once if they desire to participate, and if so state whether they will sell the tickets or only honor them.

The only change in the rules will be a provision to make half-fare detachments, which is prohibited in the present tariff. The rate will remain the same as at present, $17.50 for $20 in transportation.

Progress Is Made in International Standardization

AT THE third international standardization conference, held in New York City during the past two weeks, several subjects of interest to electric railways were considered. The meetings were held under the auspices of the American Engineering Standards Committee and delegates of eighteen national standardizing bodies were present. At previous conferences the committee on traction motors had reached complete unanimity except on two points, on which decision had been reversed by the French delegation. The

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points in the report were: (1) Application of I.E.C. rules to all types of traction motors. (2) Two classes of I.E.C. ratings, one hour and continuous. (3) Temperature rises. An ambient temperature of 25 deg. C. was chosen as a basis for comparable tables. Temperature measurement by resistance method was favored, but thermometer measurements were permitted under certain conditions. Temperature rises were specified. (4) Conditions of excitation during the test must correspond to the ratings of the motor. (5) The voltage during test of ventilated motors should be the rated voltage for both continuous and one-hour rating tests. For totally inclosed motors the one-hour test should use standard voltage and continuous rating test should use either three quarters or one-half rated voltage as specified in the particular case. The points in the report enumerated above were approved.

At another meeting the possibility of arriving at a compromise between British standard Whitworth and American national standard screw threads was discussed. Sir Richard Glazebrook, former director of the National Physical Laboratory of Great Britain, and who represented the British Engineering Standards Association, read a paper on a slightly modified screw thread developed on the basis of a suggestion by a member of the American sectional committee on screw threads. This screw thread would have an angle of thread of 57½ deg., which lies midway between the 55 deg. angle of the British standard Whitworth thread and the 60 deg. angle of the American national standard thread. If this thread is adopted there will be no difficulty in mating a bolt threaded in the new way with a nut either of the British standard Whitworth or the American national standard tapping.

Definite action was not taken at this conference, but it was decided to have the proposal circulated among the different national standardizing bodies in order that they might study the proposition.

At another conference the question of international standardization of bolts and nuts was considered. Representatives of the sectional committee of the American Engineering Standards Committee presented reports showing tentative standards which had been agreed upon and which it was thought would ultimately be adopted. Sir Richard Glazebrook, the British delegate, described experiments which the British association had been making, which seemed to indicate that much smaller nuts and bolt heads than now used in England could be adopted with satisfactory results and at less cost than the ones now used in England. In order to make further progress in standardization of bolts and nuts, the conference formally requested the British Engineering Standards Association to continue the experiments which it is making and all other national standardization bodies were requested to send to the British Engineering Standards Association any tentative standards which they are considering or standards which have been adopted by various manufacturers in different countries. These are to be analyzed and tabulated by the British association and then circulated to all of the twenty national bodies for consideration in connection with further proposals toward international standardization.

Central Master Mechanics Meet May 13

IN ACCORDANCE with the action taken at the last meeting the next regular meeting of the Central Electric Railway Master Mechanics' Association will be held at the Orlando Hotel, Decatur, Ill., commencing at 10 a.m., Thursday, May 13. Hotel reservations should be made through J. D. Barnhart, Box 97, Illinois Traction System shops, Decatur, Ill.

"The Care of Air Brakes with the View of Obtaining the Maximum Degree of Efficiency and Safety" is one of the subjects for discussion. "The Painting of Cars, Brush vs. the Spray Method" is a second subject.

In addition to these two papers the program will include reports of committees, including the report of the special committee on freight car lighting, general business, and the open forum.

After the conclusion of the regular program an opportunity will be given to visit the shops of the Illinois Traction System at Decatur.

New England Club Meets May 6

"MATERIALS and Supplies—How to Economize" will be the subject of a symposium at the afternoon meeting of the New England Street Railway Club to be held at the Copley Plaza Hotel, Boston, on Thursday, May 6. The meeting will be called to order at 3:30 p.m.

Short talks will be given as follows: "Co-ordinating the Work of the Engineering Force and the Purchasing Department," by George E. Haggas, chief engineer Cumberland County Power & Light Company, Portland, Me.; "Quantity or Seasonal Buying vs. Hand to Mouth Buying," "Manufacturers' Standards and Specifications vs. Company Standards and Specifications," "Policy of Manufacturing Supplies by Railway Companies," by R. S. Baldwin, purchasing agent the Connecticut Company, New Haven, and A. B. Fuller, purchasing agent Union Street Railway, New Bedford, Mass.; "Storeroom Practices," by William F. Crowe, corporation secretary Springfield Street Railway, and R. A. Weston, special accountant the Connecticut Company, New Haven; "Control of and Reduction of Inventory," by W. F. Maher, storekeeper United Electric Railways, Providence, R. I.; "Monthly Budget System," by Thomas F. McGarry, purchasing agent Eastern Massachusetts Street Railway, Boston, and "Simplified Practice and Obsolescence," by William W. Tirrell, statistician, formerly examiner for the Interstate Commerce Commission.

The evening meeting, following the dinner at 6:15 p.m., will be held in the Swiss Room of the Copley Plaza Hotel and will be devoted to the subject "How to Make the New England Street Railway Club of More Value to Railway Companies," by L. S. Storrs, managing director American Electric Railway Association; and George E. Pellissier, assistant manager Holyoke Street Railway. "Harnessing Our Energies" will be a spectacular electro-magnetic phenomenon illustrated by experiments never before attempted, by Harry C. White, Edison Lamps Works of the General Electric Company.

Central Traffic Association Constitution to Be Amended

REVISION of the meeting time of the Central Electric Traffic Association was proposed at the meeting of this association held in Akron, Ohio, on March 17-18. The committee on constitution and by-laws presented the following amendment to Article V, Sec. A of the constitution.

> The association shall meet on the third Wednesday of the following months: January, February, March, April, May, August, September, October, November and December, the January meeting being considered the annual meeting. Special meetings may be called at any time and place upon the request of twelve members.

This amendment has been brought to the attention of the members in a bulletin from Chairman L. E. Earlywine of the committee. It will come up for action at the next regular meeting of the association.

American Association News

Engineering Symbols

VARIOUS groups of symbols which are to be included in the report of the special committee on engineering symbols of the American Electric Railway Engineering Association were decided upon at its meeting held at association headquarters, New York City, April 20. Those present were: H. W. Codding, chairman; J. D. Kent and C. W. Squier. The committee analyzed a large amount of material and agreed upon the symbols most used by electric railways. These were grouped into the following classifications: Topographical, railway signal symbols, electrical symbols, mathematical symbols and general railway symbols.

Final drawings are being made up of all the symbols which in the opinion of the committee should be included in this report.

Metropolitan Section Aims for Membership of 1,500

SETTING a bogey of 1,500 for membership at the end of the current year the Metropolitan Section, A. E. R. A., is making real efforts to reach this goal. The bulletin of the April meeting gave the membership figure as 1,182. Attention was called to the attendance at the monthly meetings, which has been considerably under a satisfactory total for some time. Members were urged to form the habit of regularly setting aside the first Friday of each month for the section meeting. An expression of individual preference for a summer outing or an October smoker was asked from the members.

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The News of the Industry

Tayler Grant of Cleveland Railway Amended

The Cleveland Railway, Cleveland, Ohio, was granted a new franchise by the City Council on April 19. The new grant is a modernized version of the Tayler ordinance. It will run until 1950. It authorizes the Cleveland Railway to operate buses, creates a metropolitan transportation board of four Clevelanders and one member for each suburb, permits the company to pay 2 per cent commission on stock sales, raises the possible maximum fare to 10 cents instead of 6 cents, fixes the rate of fare in contiguous suburbs 1 cent higher than the Cleveland rate and changes the interest fund.

Under the amended franchise fares will go up if the interest fund falls below $500,000 and fares will go down if the interest fund rises above $1,100,000.

The new franchise was passed by the Council by a vote of eighteen to six. The Council previously had turned down a proposed amendment which would have forced recognition of the union.

W. R. Hopkins, City Manager, declared that the railway will now be in a position to attract private capital and to command an ample market for the sale of its securities in order to solve the city's transportation problems. The amended franchise will become effective on June 5. The Cleveland Federation of Labor has threatened to initiate a referendum on the amendments.

Following passage of the amendments the stock of the company jumped three points to 96½, and it is planned to sell $4,000,000 of stock as soon as the quotation reaches 100, or par.

John J. Stanley, president of the company, said the company will accept the new franchise. He ordered a notice posted in all carhouses giving the platform men an increase in pay. Effective May 1, 1926, and until further notice, the wage scale for motormen and conductors will be 65 cents an hour for the first three months of service, 68 cents an hour for the next nine months and 70 cents an hour thereafter. This is an increase of 5 cents an hour. All working conditions will remain unchanged.

Preparing for the Operation of Rochester's Canal-Bed Line

That the railroad built by the city of Rochester, N. Y., in the bed of the abandoned Erie Canal will be in operation this fall was indicated by action of the Board of Contract and Supply in awarding bids for bridge construction, specifying that the work must be done by fall.

No decision has been reached as to who will operate the line when it is completed. It is regarded that the New York State Railways, operating the local trolley system, is the only company equipped to take over the railroad. Municipal operation, it is believed, will not be deemed practicable.

The section of subway to be in use first will be from Oak Street, its western terminus on the west side of the city, to connections with two electric and two steam railroads in the extreme eastern outskirts. The line bisects the heart of the city. An overhead street of a mile has been built in the business section.

Although the Erie Canal, long since abandoned, traverses Utica and other New York State cities, Rochester is the first to make this use of the old "big ditch" of George Clinton.

The city railroad will connect with all the steam lines entering the city and will do considerable freight hauling and switching besides taking care of all interurban trolley traffic entering Rochester.

A study of operation is under way by a committee of citizens named by Mayor Clarence D. Van Zandt and headed by John P. Morse.

The city board has also authorized bids for electrical wiring for the road.

New Franchise Suggested at Fitchburg

The Fitchburg & Leominster Street Railway, Fitchburg, Mass., will seek a new franchise in that city to include the operation of buses as part of a scheme for extensive reorganization. The new franchise seeks to establish the right of the company to operate buses over a score of streets and into sections not now served by trolleys. If the new franchise is granted the right to operate buses in the city would be limited to the railway, with adequate provision made for the development of the service in the interest of the public.

Pittsburgh Considers Subway

City Transit Commission Indorses Turner-Haydock Plan and Proposes $30,000,000 Bond Issue—Rapid Transit Line to Be Operated by Pittsburgh Railways

ANOTHER step toward providing Pittsburgh with rapid transit is taken in the report recently submitted to the Mayor and City Council by the City Transit Commission. It approves the immediate construction, after the financing preliminaries have been arranged, of the first part of the rapid transit system recommended by Daniel L. Turner, consulting engineer, and Winters Haydock, chief engineer, of the Department of City Transit. It also includes a report by these engineers supplementing that presented on Jan. 23, 1925, and published in abstract on page 409 of the issue of this paper for March 14, 1925.

The sections approved are a subway from the vicinity of Federal and Ohio Streets on the north side, by way of Federal Street and Fifth Avenue at least as far as Neville Street, in the Shadyside district, to be used by rapid transit trains, and another subway, less than a mile in length, on Grand Street, in the downtown section, crossing the other at right angles, to be used temporarily by surface cars. Later, this would form part of a rapid transit line.

The City Transit Commission recommends the construction of these lines by the city and their lease to the Pittsburgh Railways under a contract of a nature similar to that under which the present surface railway system is operated, or under a "service at cost" franchise. Under this contract the railway would supply the rolling stock, electrical equipment and terminals. The city's contribution would be $36,000,000 and the railway's $4,860,000.

The report of the engineers declares that by the rerouting which would follow the opening of the north side subway in 1932 the railway could save 4,250,000 surface car-miles by the substitution of 2,240,000 rapid transit car-miles. On a basis of 30 cents per car-mile for the former and 25 cents per car-mile for the latter, a net saving in operating cost for the year of $715,000 would be obtained. If the company substituted one-man cars on its remaining surface routes, it would make an additional saving of $595,000, or a total possible yearly operating saving of $1,310,000 as of 1932, due to the construction of the proposed rapid transit line. From the operation of the Grand Street subway it is estimated an additional saving of $112,000 could be obtained.

The engineers recommend that from this net gain of $1,422,000, which does not include any allowance for increase in traffic, $291,600 could be taken to pay the additional carrying charges of the company required under the plan. This would leave about $1,130,400 to be applied toward the carrying charges of the bonds issued by the city. The city has already authorized an expenditure of $6,000,000 for subway purposes, so that an additional $28,940,000 is required to pay for the subways without equipment, but a considerable part of this, as explained, will carry itself. The commission therefore recommends a referendum at the next election on the question of authorizing the city to float an issue of bonds to the amount of $30,000,000.

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$22,000,000 Order Issued

New York Commission Votes Two to One to Require Interborough to Proceed with Plans

Orders issued by the New York Transit Commission to the Interborough Rapid Transit Company, New York, require that company to spend approximately $22,000,000 on lengthening station platforms and buying new cars and equipment. The order requires the company to pay one-half (about $6,000,000) of the cost of lengthening 56 underground platforms and 23 elevated platforms at local stations to accommodate ten-car trains. The city is required to pay the other half. The order also requires the Interborough to buy 382 new cars, costing about $10,000,000, and spend about $6,000,000 for signals, repair sheds, power equipment, etc.

Order Effective July 1

The order becomes effective on July 1 next. Chairman George McAneny and Commissioner Le Roy T. Harkness concurred. Commissioner John F. O'Ryan filed a dissenting opinion. He held that lengthening platforms constituted "new construction" rather than "additions" to the Interborough system, and, therefore, was not included in the provisions of the dual contracts under which the order was issued.

Mr. McAneny in his opinion stated the subway division of the Interborough system showed a good profit and its losses were due to the lease of the elevated lines. He declared the company could find money to finance the improvement even if it were forced to go through bankruptcy to dissolve its unprofitable elevated lease.

The opinion of Messrs. McAneny and Harkness stated in part:

> The Interborough company, as a single corporation, is operating two separate railway systems—(a) the system of subways it has leased from the city under Contracts Nos. 1, 2 and 3, and (b) the system of elevated lines it leased from the Manhattan company in 1903, for a 999-year term. In pleading its financial situation it presents, and asks that the commission take into account the joint financial statement of both its subway and elevated lines. Upon such a joint statement the company, for its last fiscal year ended June 30, 1925, showed a net deficit of $345,508.
>
> The losses on the Manhattan elevated division for the year—figured after the payment of $3,065,310 by way of rentals to the holders of Manhattan company stock—were $4,533,757. During the same period the earnings of the company under the subway lease, over operating costs and financial or other charges of every description incidental to its operation under those leases, was $4,188,249. The net deficit stated for the year is the product of the merging of these two sets of operating results.
>
> The indicated profit from the subway division for the current fiscal year—that is, for the year that will end June 30 next—is $5,500,000.

Suggests Help from City

Chairman McAneny suggested that the city might raise the money and lend it to the Interborough as the city can borrow more cheaply than the company. He made the alternative suggestion that the city might alter its contract with the Interborough so as to pay the entire cost of lengthening the platforms, on the ground that the city is a partner of the Interborough and will benefit by the improvement.

Officials of the Interborough Rapid Transit Company refused to comment on the decision, but it was stated that the company hopes the matter may be arranged without litigation and without forcing a receivership.

Brotherhood Will Handle Own Benefits in Kansas City

The Benefit Unit of the Kansas City Railways Employees' Brotherhood of Kansas City, Mo., was recently organized and later authorized by a decree of the Circuit Court of Jackson County. The brotherhood health and accident benefits, which have for the past seven years been underwritten for it by the Massachusetts Bonding & Insurance Company, will be administered by the Benefit Unit. The necessity for making the change was brought about by the Massachusetts Bonding & Insurance Company serving notice of an increased rate effective March 1. After an examination of the experience of the carrying company for the past three years, it became apparent that with a low administrative cost the brotherhood could itself handle these benefits at the rate formerly paid the Massachusetts company and grant benefits similar to those allowed in the past. The articles of agreement provide that the Benefit Unit is a corporation organized solely for beneficial purposes and not as a profit-making venture. This change does not in any way affect the group life insurance which has been carried for many years by the Aetna Life Insurance Company.

Record-Breaking Weekly Pass Installation at Wheeling

Weekly passes greater in variety than have heretofore been installed at one time will be put into effect on May 3 by the Wheeling Traction Company, Wheeling, W. Va. This company's patrons are already familiar with the Sunday-holiday pass, of which twelve types are in use. The weekly passes will number eighteen types, as follows:

RECORD-BREAKING WEEKLY PASS INSTALLATION AT WHEELING

Name of Pass	Riding Limits	Price
Wheeling	Eighth Street, Benwood, and Stop 1, Wheeling	$1.00
Greater Wheeling	Eighth Street, Benwood, and Stop 24, Warwood	1.25
McMechen	Stop 19, McMechen, and Stop 1, Wheeling	1.65
Moundsville	Moundsville and Stop 1, Wheeling	3.25
Glendale	Stop 21, Glendale, and Moundsville	0.85
Wellsburg	LaBelle Mine, Wellsburg, and Steubenville	2.75
Follansbee-Steubenville	Follansbee, south corporation limits, and Steubenville	1.50
Universal	All routes	5.00
Weirton	Steubenville and Weirton	2.25
Brilliant	Steubenville and Brilliant	2.00
Mingo	Mingo, south corporation limits, and Steubenville	1.00
Brookside	Fourteenth Street, Wheeling; Aetna Street, Martins Ferry; Stop 14, Brookside, and Stop 9, West Wheeling	1.00
Martins Ferry	Fourteenth Street, Wheeling, and Stop 6, Martins Ferry	1.25
Ohio	Fourteenth Street, Wheeling, Stop 6, Martins Ferry; Stop 26, Lansing, and Stop 27, Bellaire	1.75
Shadyside	Fourteenth Street, Wheeling; Shadyside, Stop 6, Martins Ferry, and Stop 26, Lansing	2.50
Linwood	Fourteenth Street, Wheeling, and Stop 40, Linwood	2.00
Ohio Terminals	Fourteenth Street, Wheeling; Rayland, Barton and Shadyside	3.00
Beech Bottom	Eighth Street, Benwood, and Stop 51, Beech Bottom	2.00

The present basic cash fare of the Wheeling Traction Company is 8 cents, with ticket rates of 5 cents (ten for 50 cents) in West Virginia and 5 5/9 cents (nine for 50 cents) in Ohio, but there are also combinations making use of 6¼-cent, 7 1/7-cent and special commutation rates. The prices of the passes range from eleven to twenty times the fare of riders on tickets, depending upon the nature of the traffic.

Committee of Chicago Aldermen on Tour of East

Chicago Aldermen, on tour to inspect the transit situation in various cities of the eastern United States and Canada, arrived in New York on April 28 and are at the Waldorf-Astoria.

The committee has visited Detroit, Cleveland and Philadelphia and will leave for Boston on May 1, after which it will stop at Montreal and Toronto, returning to Chicago May 6. Joseph B. McDonough, chairman of the committee, said:

> Chicago is planning to build subways from "the Loop" district, into which 700,000 pour daily. We are told that New York City made a mistake in not building its subways by special assessment instead of out of its transit fund, and we are here to investigate the subway problem. Philadelphia is making great progress, but doesn't seem to know what to do with her subways after they are built.

New Franchise at Richmond Ready for Council

At the conclusion of a three-hour discussion on April 27 the streets committee of the City Council of Richmond, Va., practically completed its report on the proposed blanket franchise to be submitted to the Common Council on May 3. Vice-President W. E. Wood and Counsel T. Justin Moore for the Virginia Electric & Power Company said that in the main the grant meets with the approval of the company. After a few unimportant amendments, the document was recommended for approval.

At 5 o'clock Monday afternoon, May 3, the committee will review the finished document and forward it to Council that night for discussion at a date to be fixed later.

There was considerable discussion as to the right of the city to fix a valuation of company's property, but it was finally agreed that the figure of $9,494,800 set in the Virginia State Corporation Commission's valuation for rate fixing was probably the most equitable. This figure is a compromise between the valuations made by Stone & Webster and John Beeler, the latter employed by the city. The committee expressed the belief that the proposed valuation and the accompanying features of the franchise were the best obtainable. With this unanimous report from the streets committee, it is believed the document will have clear sailing through both branches of City Council.

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Violation of Labor Contracts Before Indianapolis Court

Legal steps, believed to be preparatory moves toward the filing of a motion to have members of the Amalgamated Association cited for contempt of court, were taken in the federal court in Indianapolis on April 24 by attorneys for the Indianapolis Street Railway, Indianapolis, Ind., and the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind. On motion of the attorneys, Judge Robert C. Baltzell substituted the name of the Indianapolis Street Railway for the name of the Indianapolis Traction & Terminal Company as the plaintiff in a suit for an injunction which was granted by Judge A. B. Anderson in the federal court in May, 1924, thus bringing the injunction up to date. It was reported that attaches of the Amalgamated Association recently attempted to persuade employees of the two Indianapolis companies to violate their labor contracts with the company. The contract, according to attorneys, provides that the employees of the company shall not quit the service in a body.

Rythmical Vibrations Help Hearing

Recent tests conducted on a trolley car in New York by Dr. Paul Winslow, otolaryngologist, Dr. E. L. Cross, principal of the Wright Oral School for the Deaf, and F. W. Melano, representative of Dr. E. E. Free, who recently located the noisiest corner in New York, resulted in declaration by three deaf men that rythmical vibrations enabled them to hear better. First a voice test was made and then two other tests of a more mechanical nature. A student from the Institute for the Improved Instruction of the Deaf signified that he heard the buzzing of an audiometer at a distance of 25 in. when the car was still, and could make out the noise when the trolley rattled at a good speed. The other test, in which the audiometer was set at its maximum intensity of 100 so that an almost totally deaf person could hear it, was productive of similar results.

Final Westchester Rapid Transit Report Is Submitted

The final report of the Westchester County Transit Commission on the proposed rapid transit system between downtown New York and principal cities in Westchester County has been presented to the Board of Supervisors of Westchester County. It includes a report by the engineer of the commission, Henry M. Brinckerhoff, dated March 1, together with the text of Mr. Brinckerhoff's report of Dec. 15, maps, etc. Previous references to this proposed rapid transit system have appeared in the issues of this paper for Dec. 19, 1925, page 1086, and Feb. 7, 1925, page 214.

In its final report the Westchester County Transit Commission reviews briefly the eight other comprehensive plans for caring for New York's suburban passenger service. Some of these, as the transit commission plans of 1924 and 1925 and the New York, Westchester & Boston plan for a distributing system at 125th Street, are not considered satisfactory for Westchester commuters. But the commission does express the belief that a combination is possible between the Westchester plan and the loop in New York City for suburban passengers, proposed by the North Jersey Transit Commission. This possibility is considered more at length in the engineering report of Mr. Brinckerhoff, who believes the two plans can be harmonized and combined with a saving of large sums in construction and greater economy of operation than by building and operating separate systems.

The report also devotes considerable space to the need of cross-country bus lines to act as feeders for the rapid transit system at its northern end. Data on existing bus lines and those for which franchises have been requested are given in the report.

Safety Committees Formed in Springfield

A definite idea of safety with a well-arranged program of activity leading to that objective has been the policy of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio. Its plan includes a carefully selected organization with various committees comprising the general safety committee. H. P. Smith is director of safety of the company and ex officio head of the general safety committee. The accompanying illustration shows the men selected to head the many committes when the annual reorganization meeting was held last fall.

During the twelve months ending Aug. 31, 1925, the Indiana, Columbus & Eastern Traction Company and its subsidiary bus lines, the Dayton & Columbus Transportation Company and the Springfield & South Charleston Transportation Company, carried 2,198,953 passengers without a fatal accident to a passenger, according to a report made public by J. M. Pogue, general manager. The company operates seventeen daily passenger trains between Springfield and Columbus; eight between Springfield and Lima; eighteen buses between Lima and Columbus and seven buses between Springfield and Lima.

Staten Islanders Want Railway Line Continued

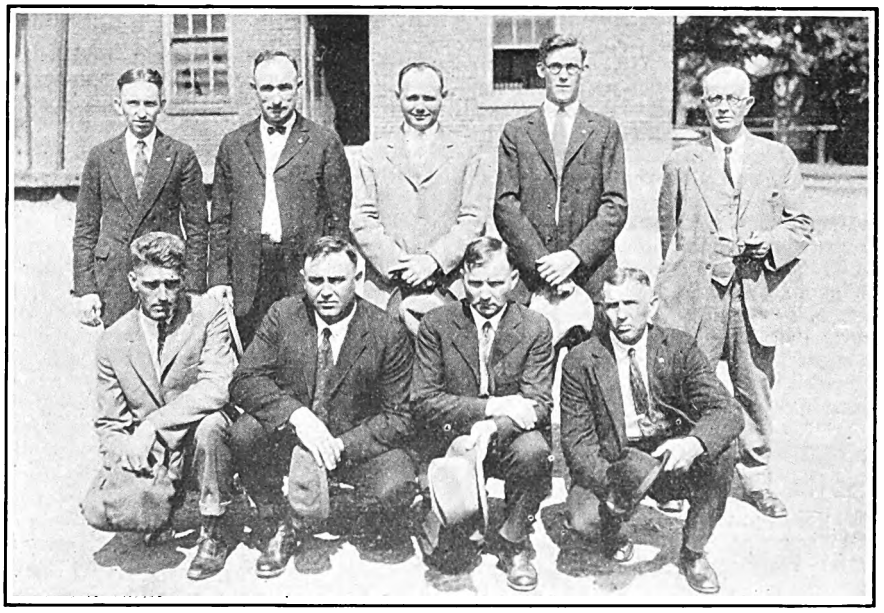
The Staten Island Civic League has drawn up a report strongly opposing withdrawal of the municipal trolley lines and three "trackless" lines contemplated by the city of New York. Copies of the report were sent to the Board of Estimate and the Board of Transportation.

The action, which would result in the removal of the lines, is contemplated on the ground that they are operated at a loss. Five years ago under the Hylan administration the city started the "trackless" trolleys and took over five lines operated by the Midland Railroad. It has since operated them on a 5-cent fare.

Recently it was reported that the venture was costing the city approximately $250,000 a year. This report was followed by an announcement that the city intended to withdraw the cars unless it could get a substitute company to operate them.

The league opposes the move on the ground that the action would not be in conformity with the city's policy in other regards. It approves a comprehensive bus system, with free transfers from bus to bus and from buses to cars which the buses feed.

Honor for Railway Man.—C. D. Emmons, president of the United Railways & Electric Company, Baltimore, Md., was elected a member of the board of directors of the Baltimore Association of Commerce at the annual meeting of the organization on April 22.



Heads of Committees Comprising General Safety Committee

Left to right, from row—Ralph Mitman, motive power; J. M. Schneider, carhouse and shops; A. N. Allen, conductors, and Samuel Black, maintenance. Rear row—F. N. Malling, agents and clerks; Charles Killinger, buses; L. K. Linkhart, motormen; Henry Aiple, general offices, and Fred Harman, freight division.

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Ten Cents in Sioux Falls—Paving Relief Granted

At the annual city election in Sioux Falls, S. D., on April 20 the people voted to raise the railway fares of the Sioux Falls Traction Company to 10 cents, the same as the present bus fare, with tokens sold fifteen for $1, instead of seventeen as at present. The car fare has been 6 cents. The granting of the right to the company to raise its fares was given by nearly a two to one vote. The opposition registered 1,851 votes and the advocates totaled 3,612. With reference to its petition for relief from paving the company won by only a majority of 390.

A committee recently investigated the precarious situation alleged to have existed on the Sioux Falls property and the admitted operation at a loss. It recommended relief for the traction company in order to keep cheap transportation in all parts of the growing city after noting a decrease in patronage, increase in operating expense and a loss in gross revenue. The report of the committee also stressed the loss in bus business. The buses, which started operation in 1923, produced a net revenue of $2,149 in 1924, but in 1925 produced a net loss of $2,048. The number of passengers also fell off in 1925 compared with the number carried in 1924; that is, from 598,511 in 1924 to 557,682 in 1925. The committee's report was submitted to the City Commission, with the result that the ordinances were passed for submission to the voters on April 20.

Vote to Relieve Beaver Valley Property of Paving Burden

Citizens of Monaca, Pa., recently adopted a resolution to relieve the Beaver Valley Traction Company, New Brighton, of its obligation to pave between the rails in Monaca, in the event that it agrees to reconstruct its tracks with steel ties on concrete foundation. The resolution came after a citizens' meeting with the Council to discuss the responsibility of the company in paving its part of Pennsylvania Avenue and Ninth Street. C. D. Smith, general manager of the company, presented figures and charts of the operation of the street cars in general in the valley, and also the operation and maintenance of the system in Monaca. The operation of the cars in Monaca showed a deficit of approximately $5,000 last year, and for that reason the company could not financially assume the expenditure that would be required in taking care of the company's share of the paving as specified in the franchise under which the company was operating.

Mayor Grants San Francisco Men Forty Cents Increase

Mayor James Rolph, Jr., of San Francisco, Cal., instructed the Board of Public Works on April 21 to award platform men employed by the San Francisco Municipal Railway a wage increase of 40 cents a day. The increase will raise the daily pay of platform men to $5.80. It will not, however, affect the salary of trackmen, repair men, janitors, or clerks. The increase will be paid out of the present income of the road and will not necessitate an increase in the present 5-cent fare.

The railway officials told the Mayor that there was a surplus of $90,000 in the operating fund of the road that might be applied immediately toward the raise, and that the income of the line would be sufficient to meet the increased overhead.

The Mayor's order came after an eighteen months campaign waged by the employees of the municipal railway for an increase in pay. The original demand was for an additional $1 a day. When it appeared that this was impossible of fulfillment, the amount was reduced to 60 cents a day. The 40-cent increase suggested by the Board of Supervisors was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 17, page 691.

North Shore & Waukegan Incorporated

To provide a legal means of adding to its electric railway service and putting on buses and taxicabs in Waukegan, Ill., city service the Chicago, North Shore & Milwaukee Railroad recently incorporated the North Shore & Waukegan Railway. The Chicago, North Shore & Milwaukee Railroad operates city service cars and also certain trains on its main line in the town of Waukegan. Questions arose about the legality of expansion under the present charter, so new articles of incorporation were filed, in which certain department heads and officials of the parent company were named. The capital of the new company is $2,000. The incorporators are Warren Nichols, Joseph M. Griffen, Frederick E. Stout, Frank L. Wolf and A. C. Spier.

News Notes

Beach Service Resumed.—With the resumption of service by the Nantasket Beach Steamboat Company, Boston, Mass., the electric railway operated by the New York, New Haven & Hartford Railroad on the Nantasket Beach branch between Nantasket Junction and Pemberton has also been started.

Wants Cars in Baltimore Rerouted.—The Baltimore Traffic Survey Commission has petitioned the Maryland Public Service Commission for an order requiring the United Railways & Electric Company to reroute its cars in accordance with the outline of the survey commission's report. The Public Service Commission has set no date for a hearing. The hearings will be public.

"News and Views" Chosen.—In a contest conducted among the patrons of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to select an appropriate title for its new publication containing news of the company's activities the name of "News and Views," submitted by two Milwaukeeans, was selected by the judges as the best. Each received the prize award of $100. This news bulletin will appear at frequent intervals in company cars and buses.

All's Well in Virginia.—The people of Virginia are pulling together for the progress and development of the state, in the opinion of the Virginia Electric & Power Company expressed in a letter by Luke C. Bradley, president, to the stockholders. The letter states that matters inside the company and agencies outside the company are all working to push the expansion program of the company. Stockholders were urged to write to the company frankly on any matter pertaining to company operation.

Railway Helps Community Fund.—The Memphis Street Railway and the Memphis Power & Light Company of Memphis, Tenn., on April 14 submitted a joint subscription of $15,000 to the Community Fund Campaign. This was the largest subscription.

Adjournment in Utica Fare Case.—After examination of several witnesses on April 27 an adjournment was taken by the Public Service Commission to a date to be fixed later in the matter of the application of the Utica lines of the New York State Railways for permission to increase trolley fares. A rate will be fixed after engineers of the commission have completed their inventory of the Utica lines.

Railway Robber Sentenced.—Robert Steele of Carbondale, Ill., who held up and robbed the passengers of the Murphysboro & Southern Illinois Railway 1 mile west of Carbondale several weeks ago has been sentenced to serve from three to twenty years in the southern Illinois penitentiary at Chester, Ill. He pleaded guilty in the Circuit Court at Murphysboro, Ill., April 20.

Railway Service to Mount Royal.—The Montreal Tramways, Montreal, Canada, on April 4 installed a new railway service to Mount Royal, a town of 1,250 population. This new line marks the linking up of Mount Royal with the city by railway. Hitherto the common connection has been through the mountain tunnel by the Canadian National Railways. Mayor Darling of the town said that the new service would be of great assistance to those who are employed in the eastern portion of Montreal. He believed that this line would not be in competition with the Canadian National Railways through the tunnel under the mountains, but would supplement it.

Reward for Accident Prevention Work. — Trainmen of the Oklahoma Railway, Oklahoma City, Okla., are to receive a bonus for accident prevention work. George A. Henshaw, receiver, who explained the plan, said that the total number of accidents each month would be compared with the total for the corresponding month of last year, and for each unit by which the total was reduced the company would pay the trainmen's fund $10. The trainmen may allow the money to pile up in a fund until the end of the year, then divide it among themselves as a Christmas bonus, or they may use it to defray the expense of a number of entertainments or social events, or in any other way they deem desirable. Automobile drivers and the public in general are asked to help the trainmen increase earnings by preventing accidents.

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Recent Bus Developments

Bus Merger Plans Before Indiana Commission

Plans for the consolidation of all Insull-owned bus lines in the northwestern part of Indiana into one new bus company to be known as the Shore Line Motor Coach Company were outlined before the Public Service Commission on April 22, when a hearing on the proposal was held. This merger was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 10, page 650. Evidence also was heard at the hearing on another proposal. This provides that the Gary Railways and the Chicago, South Shore & South Bend Railroad buy most of the capital stock of the new Shore Line Motor Coach Company. In all 24 bus lines would be consolidated in the proposal, of which 21 originally were obtained and now are operated by the Gary Railways. The entire purchase price is $272,188. The Shore Line wants to sell $400,000 of common stock and to use $163,546 for necessary additional equipment.

Sightseeing Operation at New York a Subterfuge

Supreme Court Justice George H. Taylor, Jr., at White Plains, N. Y., on April 26 handed down two decisions enjoining the operation of sightseeing buses from New Rochelle to Manhattan.

Action against these companies and the Mount Vernon Sightseeing Bus Company, which previously was enjoined, were brought by the Westchester Electric Railway, a subsidiary of the Third Avenue Railroad, New York. The plaintiff contended the bus companies had not obtained certificates of convenience and necessity.

It was reported in White Plains that the three bus companies will carry an appeal to the Appellate Division of the Supreme Court. The companies mentioned in the injunctions granted on April 26 were the Luna Cars, Inc., and the New Rochelle Sightseeing Bus Company. They operated seventeen buses between New Rochelle and Times Square. Justice Taylor said:

> It is admitted that the certificate of convenience and necessity, which under the transportation corporation law I hold to be prerequisite to the lawful operation of its line, has not been obtained. Provisions of Section 25 have been wholly ignored by the operations of the defendants.

Justice Taylor also directed a prompt trial of the case. Albert Davison appeared as counsel for the railway. The permits to the sightseeing buses were issued by the officals of Mount Vernon and New Rochelle.

Kentucky Buses Under New Rule

Kentucky buses are now operating under a new law following the signing of a House bill by Gov. William J. Fields. The bill levies a tax of $1 a hundred pounds on the gross weight, a license tag fee ranging from $10 to $50, according to capacity, and a fee, ranging from $5 to $15, on each seat. It creates the office of Commissioner of Motor Transportation, who has authority to grant certificates of convenience and necessity and fix routes, schedules and fares. Limited review by a circuit court is provided. Certificates are revocable for cause, but are renewable annually on payment of fees. Existing lines are protected.

The law covers all motor vehicle passenger common carriers, including taxicabs, except school and funeral buses, which are specifically exempted. Buses operating entirely within municipal limits are also exempted. The commissioner is permitted to fix the size of the required accident indemnity bond.

Bus Service for Crippled Children at Toronto

Transportation of crippled children by bus began in Toronto, Ont., on April 14. Three buses are operated in the morning and three in the evening with the following routes:

> Route No. 1 will be operated by a bus off the Rosedale route, leaving Bloor and Sherbourne at 8:55 a.m., then following Route No. 1 as laid out, arriving at the school around 10 a.m.
>
> Route No. 2 will be operated with a coach running off the Hill route around 8:50 a.m. This coach will travel via Lakeshore Road to the commencement of the No. 2 route and work outward toward Wellesley Street school, arriving there around 9:50 a.m.
>
> Route No. 3 will be covered by a separate bus run off the Jane route, leaving Bloor and Jane at 9 a.m., operating over the route as laid out toward Wellesley Street school, arriving there around 10 a.m.

The total number of route-miles is 55.20. The total number of hours for this work is six hours and 55 minutes, nearly 8 m.p.h., and the revenue derived is approximately 50 cents per bus-mile.

Miss Milne, of the Department of Education, is satisfied with the service.

Route No. 3 operates the separate school bus, commencing at 8:30 a.m., then runs onto the crippled children routes and also does two services in the evening.

These services are not costing the commission anything in the way of bonuses or overtime. Straight time is paid to the amount of six hours and 55 minutes.

Youngstown Company Extends Bus Service

The Pennsylvania-Ohio Coach Lines Company, bus subsidiary of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, recently took over the operation of the lines heretofore operated by the Cleveland, Warren & Youngstown State Company. Permission for the purchase of the lines was granted by the Ohio Public Utilities Commission. With the acquisition of the Cleveland, Warren and Youngstown lines the bus lines of the Youngstown company extend from Cleveland and Akron throughout this region eastward to Sharon, Greenville, Meadville, Conneaut Lake, New Wilmington and New Castle, Pa.

Electric Railway Victor Over Steam Line

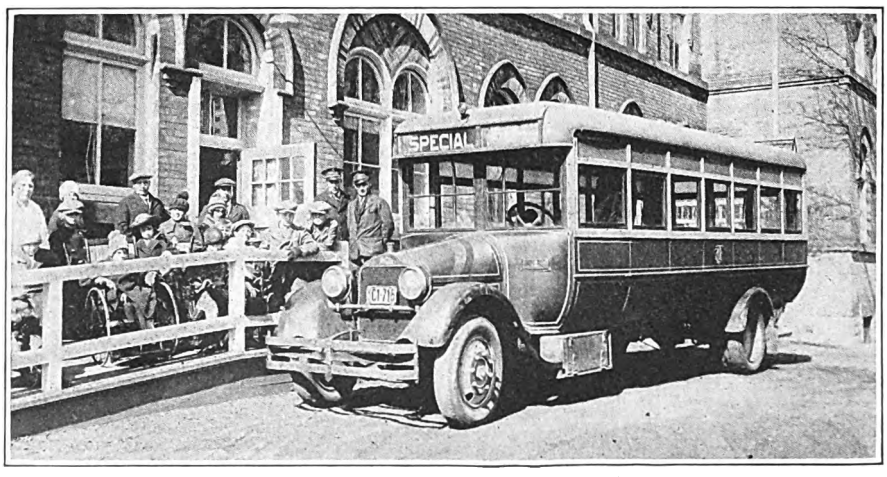
The Minnesota Railroad and Warehouse Commission has denied permission to the Northland Transportation Company, a subsidiary of the Great Northern Railroad, to compete with the buses of the Twin City Motor Bus Company, subsidiary of the Twin City Rapid Transit Company, in carrying passengers between Minneapolis and St. Paul. The plan was to operate these buses over University Avenue and to carry local traffic.

The commission allows the Northland to begin on May 15 to run seventeen of its 27 long-distance buses from the Minneapolis terminal to St. Paul over the Franklin Avenue bridge route, but without a provision permitting the buses to take on or drop off passengers en route.

St. Paul had asked that long-distance buses from the north extend the route from the Minneapolis station to St. Paul. The company could come to no agreement with the Twin City company for carrying passengers between the two cities, so it made a move to run through and reimburse itself with carrying local traffic.

The decision is a distinct victory for the Twin City Rapid Transit Company, which now has a monopoly of the passenger business between the two cities by trolley car and bus. The commission said:

> This places the local transportation systems of these two cities and suburban points under one directing organization, which should lead to the greatest efficiency of operation and the minimum of cost and



Crippled Children at Toronto Ready to Be Transported

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furnish adequate facilities to meet the increasing transit needs of these rapidly expanding communities.

The order to the Northland company authorizes it to extend its Taylors Falls service to Minneapolis from St. Paul.

Certificates of convenience and necessity were granted to the Twin City Motor Bus Company to operate buses (already in actual operation) between the Twin Cities over the Como Avenue, University Avenue and Lake Street routes and between Minneapolis and Glen Lake, with probable change of loop routes in both cities. Slight changes were made in the passenger rate on the latter line.

Commission Has Control of Colorado Buses

Bus lines carrying passengers, freight or express are common carriers under the public utilities act of Colorado and are subject to regulation by the Colorado Public Utilities Commission, according to a decision by the State Supreme Court in the case of the Greeley Transportation Company. Under the decision the commission has power to grant or deny permits to persons or companies for the operation of bus lines in the state and has power to formulate rules and regulations governing the operation of such lines.

Bus Program Put Through by New York Legislature

Practically the entire program advocated by the Public Service Commission and bus transportation interests was passed by the New York State Legislature, which adjourned on April 23. Included in its annual report was a recommendation of the Public Service Commission that bus lines be made common carriers and a separate article of the public service commission law added specifically regulating this branch of the transportation business. This was done under two bills introduced in the Senate by Warren T. Thayer, and now in the hands of the Governor.

Two bills in the hands of the Governor permit bus companies to hold stock in street railroad companies. Both amend the same section (section 54) and the Governor must take his choice as to which he will approve. The Sargent bill provides that such companies organized under the transportation corporations law may exercise such privilege. This bill passed both houses of the Legislature, went to the Governor, was recalled and after the passage of the Thayer bill was again returned to the executive chamber. The Thayer bill permits the exercise of such privilege by any bus corporation, however organized, subject either to the jurisdiction of the public service or transit commission.

In the closing hours of the session the Messer bill passed both houses of the Legislature. This measure permits the substitution, on approval of the Public Service Commission, of buses for cars or trains on tracks of railroad companies or street railways.

Another measure in the hands of the Governor will make it exceedingly difficult for a new bus company to engage in business in New York City. This is the Wales bill. It amends section 172 of the railroad law by providing, on application for consent of local authorities, written notice of filing such application shall be given to all common carriers operating through territory through which applicant proposes to operate.

Bus Service Planned.—The Key System Transit Company proposes as an improvement in transportation a bus line in Berkeley, Cal., to extend from Gilman Street to Berkeley Place, tapping a thickly settled, recently developed residential district of the city. At present this section has no means of transportation.

New Buses on Market Street Line.—The Public Service Railway, Newark, N. J., put into operation on April 21 on the Market Street line the first of the 333 gas-electric type buses. Three machines are in use for the late rush-hour service especially in Roseville Avenue. Others will be operated on the Bergan line serving Hackensack, Little Ferry, Ridgefield Park, Ridgefield, Fairview, North Bergen, Guttenberg, West New York and Weehawken. The buses operate every fifteen minutes with running time between terminals 55 minutes.

Service Extends to Abbotsford.—The British Columbia Rapid Transit Company, a subsidiary of the British Columbia Electric Railway, Vancouver, Canada, is now operating coaches to Abbotsford, and in the near future will be running through to Chilliwack. This can be done only when the new road across Sumas prarie is ready for traffic. The company has ordered two new coaches similar to those in use between Vancouver and New Westminster.

Proposal for Bus Service Expected.—A movement by the Syracuse & Eastern Railroad, Syracuse, N. Y., to supplant its electric railway lines with buses is seen in the announcement that the proposal to establish bus service between Syracuse and Fayetteville is to be taken up at the annual meeting of the company on May 14. The company has been operating buses from Syracuse to Salt Springs Road and Selley Road for two years.

Will Carry Merriment Seekers to Resort.—A bus service to Fountain Lake, a popular swimming resort northeast of Hot Springs, Ark., on the Little Rock highway, will be started on May 1 by the Hot Springs Street Railway. The buses will be operated throughout the summer and will run on a 45-minute schedule from 10 o'clock in the morning until 11 o'clock at night. A fare of 40 cents for the round trip will be charged; the one-way fare 25 cents.

Buses Will Replace Cars.—The Denver & South Platte Railway, operating between Englewood and Littleton, Colo., about 6 miles, has been authorized by the State Public Utilities Commission to abandon service effective on May 5, tear up its tracks, remove the wires and to substitute buses. The company's plea was based upon the fact that it was losing money. Those who opposed the elimination of the street cars failed to sustain their point. The commission said: "You have failed to support the cars sufficiently to enable the railway to carry on."

New Line Proposed.—The San Francisco, Napa & Calistoga Electric Railway, San Francisco, Cal., has applied to the State Railroad Commission to run buses between Calistoga and Vallejo in conjunction with its present train service. The railway plans to discontinue certain trains if permitted to operate the buses along the highway paralleling the railway.

Bus Service to Replace Stub Line.—Fred N. Carpenter, president of the Carpenter Rapid Transit Company, which operates buses for local service Tonawanda and North Tonawanda, has outlined to the Tonawanda Board of Aldermen plans for increasing the number of bus routes in the city as soon as the International Railway, Buffalo, abandons its Military Road and Kenmore-Tonawanda car lines. The Aldermen favor the Carpenter plan.

Seeks Fare Increase.—The Indiana Service Corporation of Fort Wayne, Ind., operating interurban and bus lines, recently asked the Indiana Public Service Commission for permission to increase fares to a basis of 3 cents a mile on three bus lines the company bought some time ago from private owners and to abandon another line. The line which the company seeks to abandon runs between Fort Wayne and Muncie. The three lines on which more fare is asked are from Fort Wayne to Peru, to Marion and to Auburn and Angola. Insufficient revenue is given as the cause for the rate boost request.

No Loss to Be Suffered by Bus Company.—The Joseph Darst Realty Company has guaranteed the St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., against loss on the new feeder line into the Delmar-Olive division of the railway from the Olive Street Road from as far west as the Woodson Road. Dartsdale, a subdivision on the Olive Street road, was opened several months ago by the Joseph Darst Realty Company, progressive real estate operator. It tried the experiment of operating independently owned buses to its subdivision property, but the results were unsatisfactory. It then decided to present the problem to the St. Louis Bus Company, and the result was this unusual departure in co-ordinated bus and railway service.

Would Compete with Railway.—Application for a 50-year franchise to operate a passenger bus service in the city of South Bend, Wash., has been presented to the City Council by Oscar Oman of the Ocean Beach Transportation Company. The act follows the announcement of the Willapa Electric Company that it had applied to the Department of Public Works to abandon its present railway line in and between the cities of South Bend and Raymond and to substitute bus service. In order to protect the railway ordinances were passed years ago forbidding the operation of buses in the city. At one time the Eager and the Oman company, predecessors of the present Ocean Beach Transportation Company, which operates the stage line through several beach towns, planned to petition for a permit to extend their lines through to Raymond, but were blocked by the railway. The present application will be heard on May 3.

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Financial and Corporate

Dividend Passed

Texas Electric Railway to Apply Deferred Dividends on First and Second Preferred to Improvements

For the first time since the formation of the Texas Electric Railway in 1917 payments of dividends on the first and the second preferred stock will be deferred. This decision was reached at a meeting of the board of directors on April 23 after a careful study of estimates of the company's financial position in the years immediately in the future. The drought last year was so severe that not more than half of the normal crop of cotton was produced in the territory served by this railway. Some sections produced only a third of the normal crop, while a few sections in the northern part of the state were not so seriously affected. There is no other one product that affects business in this locality so seriously as cotton and many other utilities operating in this district suffered losses in gross revenue from the same condition.

PROPERTY MUST BE KEPT UP

The board of directors was unwilling to sacrifice the maintenance or improvement of the property to pay dividends, as it is the belief that only by rendering a superior service can the road be in position to compete successfully with the state and county highways and the ever-increasing competition upon them caused by the private automobiles. The directors and management have undertaken to effect economies of operation other than curtailment of maintenance and the betterments planned for the immediate future which will tend to induce new business. Plans for inducing increased riding are already under way, and new plans are being developed that will be announced shortly.

Jack Beall, president of the Texas Electric Railway, made the following statement about the matter to the representative of the ELECTRIC RAILWAY JOURNAL in Dallas:

Unfortunate as it is to defer payment of dividends on the preferred stocks, it nevertheless seems advisable at this juncture. Reduced revenues caused by the drought of last year will probably continue until money is again available from the profits of this year's crop of grain and cotton. The excellent weather at the present time has heartened the farmers and they are now planting cotton on extensive acreage.

The property has always been maintained in excellent operating condition and the company has been engaged in extensive betterments, including additional ballast and the rebuilding of wood bridges and trestles with steel and concrete structures. On the 100-mile line between Dallas and Waco the 6,500 ft. of wood bridges existing in 1920 have been reduced to 500 ft. In other words, 6,000 ft. of bridges have been rebuilt with steel or concrete structures and creosoted pine.

The directors are unwilling to curtail the budget expenditures planned for this year and desire even to improve maintenance, in the belief that a superior service will attract additional business. The management is charged with the task of making certain curtailments in operating expenses and of making additional efforts to obtain new business. In common with other railway operations the Texas Electric has suffered from private automobile competition and to some extent from bus competition, although indirectly, since there is no paralleling operations on the property except for 32 miles between McKinney and Dallas.

It is the belief, in short, that this plan will prove to be the best in the long run and that future net earnings will allow the reestablishment of the preferred stocks on the dividend basis. The improvement in physical property is expected to reduce operating expenses and better the service. More extensive advertising should improve the gross revenue.

A digest of the report of the company for 1925 was published in the JOURNAL for March 27, page 568.

Slight Gain in Net in Minneapolis

The first full quarter report since the Minneapolis Street Railway, Minneapolis, Minn., has operated under the advanced fare of 8 cents cash and six tokens for 40 cents permitted by the Minnesota Railroad and Warehouse Commission, instead of 6 cents flat, shows net of $291,250. This is a gain of $3,929 over the first quarter of 1925. Compared with the net for 1924, when the figure for the first quarter was $246,187, the gain is $45,063. Operating revenue gain of $88,189 for the quarter this year was offset by an increase of $78,116 in operating expenses over 1925. The operating revenues respectively were $2,133,857 and $2,045,668 and expenses $1,416,622 and $1,338,506. Tax levies reduced the income by $208,423 to $508,812. Interest and miscellaneous charges were $231,997. The income from rentals and non-operating sources was $14,325.

Net Income for 1925 Shows Improvement

Details of Operation from Railways Representing 90 per Cent of Earning Capacity of Industry—Slight Decrease in Traffic Offset by Lower Operating Costs and Increased Efficiency—Operating Ratio Slightly Lower than in 1924

IMPROVEMENT was shown in the financial condition of the electric railways as a whole in 1925 compared with 1924. There was a small decrease in the volume of traffic handled and in consequence a corresponding decrease in the gross revenues, but lower operating costs offset these adverse factors and produced an increase in the net revenue in the larger cities. The interurbans and smaller companies are still reporting unfavorable results. While the gains that have been made by the industry as a whole are encouraging, conditions are still far from satisfactory.

His summary of the net results of operations in 1925 is based on the reports of a group of companies representing approximately 90 per cent of the earning power of the industry. Altogether 327 companies reported and the accompanying tables give briefly the most significant facts in connection with their operations.

COMBINED OPERATIONS OF 327 COMPANIES

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$832,506,416	$835,085,489	(D) $2,579,073	(D) 0.31
Railway operating expense	610,752,671	617,065,623	(D) 6,312,952	(D) 1.02
Net operating revenue	$221,753,745	$218,019,866	$3,733,879	1.71
Operating ratio, per cent	73.36	73.89	(D) 0.53	(D) 0.72
Miles of track	31,189.59	31,284.96	(D) 95.37	(D) 0.31
Revenue passengers	11,569,799,316	11,705,440,140	(D) 135,640,824	(D) 1.16
Total passengers	14,511,690,825	14,627,347,649	(D) 115,656,824	(D) 0.80
Car-miles, revenue	1,971,496,333	1,962,126,053	(D) 9,370,250	0.48

The reduction in operating expenses was brought about by lower material costs and by more efficient operation, particularly in the use of labor. The cost of labor continued comparatively stable, the average wages at the end of the year being only slightly more than 1 per cent above the average at the end of 1924. The slight decrease in traffic was caused by the continued increase in the use of the private automobile and by subnormal industrial conditions in certain sections of the country, particularly in New England and the northwestern states.

So writes Edmund J. Murphy, chief statistician of the American Electric Railway Association, in *Aera* for May.

The total number of passengers carried by this group of companies in 1925 was 14,511,690,825, a decrease of 0.80 per cent compared with 1924. Of these 11,569,799,316 were revenue passengers, a decrease of 1.16 per cent from 1924.

The total railway operating revenue of these companies in 1925 was $832,506,416, a decrease of $2,579,073, or 0.31 per cent. The operating expenses, however, decreased $6,312,952, or 1.02 per cent. This more than offset the loss in revenue. There was an increase of $3,733,879, or 1.71 per cent, therefore, in the net revenue from operations. The actual amount in 1925 was $221,753,745, compared with $218,019,866 in 1924. The operating ratio of the group dropped from 73.89 per cent to 73.36 per cent.

It will be noted that the decrease in operating revenue compared with 1924 was considerably less than the decrease in revenue passengers. The respective

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amounts were 0.31 per cent and 1.16 per cent. This difference is due to a slightly higher average rate of fare in 1925. When total passengers are considered, however, the effect of the higher fare is offset to some extent by the increase in the number of transfer passengers.

Bus Operations

These figures include for the most part only railway operations. There were, however, 30 companies that included bus operations in their reports. These operations, therefore, are included in the above table. They are so insignificant in comparison with the totals for the railways, however, that their effect is practically negligible.

In order to picture the total operations of all kinds of electric railways the accompanying table was prepared in which the bus operations of 66 companies controlled or operated by electric railways have been added to the railway operations. This table then includes 327 railway companies and 96 bus undertakings controlled by electric railways.

COMBINED OPERATIONS OF 327 RAILWAY COMPANIES AND 96 CONTROLLED BUS UNDERTAKINGS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Operating revenue	$840,395,490	$838,904,506	$1,490,984	0.18
Operating expense	618,757,782	620,743,272	(D) 1,985,490	(D) 0.32
Net operating revenue	$221,637,708	$218,161,234	$3,476,474	1.59
Operating ratio, per cent	73.63	73.99	(D) 0.36	(D) 0.49
Revenue passengers	11,632,868,986	11,734,410,535	(D) 101,541,549	(D) 0.87
Total passengers	14,583,367,813	14,660,991,440	77,623,627	(D) 0.53
Car- and bus-miles, revenue	2,003,400,393	1,977,825,691	25,574,702	1.29

With the bus figures added the gross revenues are increased and net revenues decreased. Some of the bus lines were not in operation in 1924, and many of those that were added new lines during the year and put on additional buses. All of this added substantially to the passenger traffic and the gross revenues. On the other hand nearly all of the bus lines are operating at a loss and when they are averaged in with the railways the effect is to increase expenses and raise the operating ratio of the group. Their total effect on the railway figures, however, is less than one-half of 1 per cent. In spite of the fact that bus operations are increasing by leaps and bounds, they only reduce the decrease in passenger traffic from 0.80 per cent for the railways alone to 0.53 per cent for the combined group.

In the scheme of analysis the whole group of 221 companies is first considered. The group of companies is then classified into city companies, interurban companies and combination companies operating both city and interurban lines.

Finally each of the three classes of companies is further subdivided into three smaller groups according to the sizes of the companies as follows: "A" companies, having gross railway revenues of $1,000,000 or more per year; "B" companies, having annual revenues of from $250,000 to $1,000,000, and "C" companies, having annual revenues of less than $250,000.

The operations of the combined group of 221 companies follow very closely those of the larger group of 327 companies. The differences are in favor of the larger group, due to the inclusion of several metropolitan companies omitted in the smaller group. Thus revenue and total passengers decreased 2.87 per cent and 2.33 per cent respectively for this group of 221 companies and operating revenues were down 1.15 per cent. The effect of a higher average fare and a more liberal use of transfers is noticeable in these figures as they were in the figures of the 327 company group.

Something of an offset to these unfavorable comparisons is furnished by the operating expenses of the smaller group, which were 1.62 per cent lower, a substantially greater decrease than that recorded by the larger group. The operating ratio, however, is somewhat higher, although it dropped from 75.13 in 1924 to 74.78 in 1925. Net revenue was up 0.25 per cent.

Taxes as usual increased, the amount being $242,244, or 0.69 per cent. This was offset by an increase of $359,764 in the net revenue from auxiliary operations, the increase amounting to 10.05 per cent over 1924. An increase of $918,158, or 11.08 per cent, in non-operating income helped at this point and produced a gross income of $116,090,794, compared with $114,602,722 in 1924, an increase of $1,488,072, or 1.30 per cent. Deductions from income or fixed charges were $95,034,960, a decrease of $937,079 from 1924, or 0.98 per cent. Net corporate income was $21,055,834, compared with a net income of $18,630,683 in 1924. The increase was $2,425,151, or 13.02 per cent.

The average cost of operation per car-mile of this group of companies was 33.50 cents in 1925, compared with 33.79 cents in 1924. The decrease can be traced to the power and maintenance

Statistics Compiled by American Electric Railway Association

Part I—Combined Operating Reports of 221 Electric Railways for the Calendar Year 1925 Compared with 1924

TABLE I—COMBINED INCOME STATEMENT

	1925	1924	Increase or Decrease (D) Total	Increase or Decrease (D) Per Cent	Cents per Car-Mile 1925	Cents per Car-Mile 1924	Cents per Car-Mile Per Cent Increase
Railway operating revenue	$546,259,829	$552,622,641	(D) $6,362,812	(D) 1.15	44.80	44.98	(D) 0.40
Railway operating expense	408,485,147	415,187,030	(D) 6,701,883	(D) 1.62	33.50	33.79	(D) 0.86
Net operating revenue	$137,774,682	$137,435,611	339,071	0.25	11.30	11.19	0.98
Net revenue: Auxiliary operations	3,937,800	3,578,036	359,764	10.05	0.32	0.29	10.34
Taxes	34,997,018	34,754,774	242,244	0.69	2.87	2.83	1.41
Operating income	$106,715,464	$106,258,873	456,591	0.43	8.75	8.64	1.27
Non-operating income	9,203,127	8,284,969	918,158	11.08	0.75	0.67	11.94
Gross income	a $116,090,794	b $114,602,722	1,488,072	1.30	9.52	9.33	2.04
Deductions from gross income	95,034,960	95,972,038	(D) 937,079	(D) 0.98	7.79	7.81	(D) 0.26
Net income	$21,055,834	$18,630,683	$2,425,151	13.02	1.72	1.52	13.15
Operating ratio (per cent)	74.78	75.13	(D) 0.35	(D) 0.47	....	....	.....
Ratio: Net income to operating revenue	3.85	3.37	0.48	14.24	....	....	.....

a Includes $172,203 equalization income. b Includes $58,880 equalization income.

TABLE II—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or Decrease (D) Total	Increase or Decrease (D) Per Cent	Cents per Car-Mile 1925	Cents per Car-Mile 1924	Cents per Car-Mile Per Cent Increase
Way and structures	$60,833,182	$61,246,911	(D) $412,729	(D) 0.68	4.98	4.98	.....
Equipment	52,375,494	54,799,849	(D) 2,424,355	(D) 4.43	4.29	4.46	(D) 3.81
Power	56,022,802	59,212,509	(D) 3,189,707	(D) 5.39	4.59	4.82	(D) 4.77
Conducting transportation	176,451,629	178,656,502	(D) 2,204,873	(D) 1.24	14.47	14.54	(D) 0.48
Traffic	2,144,047	1,756,542	387,505	22.06	0.17	0.14	21.43
General and miscellaneous	57,796,246	57,040,465	785,781	1.32	4.74	4.64	2.15
Transportation for investment—Cr	—387,460	—340,982	46,478	13.63	0.03	0.02	50.00
Total operating expenses	a $408,485,147	b $415,187,030	(D) $6,701,883	(D) 1.62	c 33.50	d 33.79	(D) 0.76

a Includes $3,249,207 undistributed expense. c Includes 0.27 cent of undistributed expense.
b Includes $2,815,234 undistributed expense. d Includes 0.22 cent of undistributed expense.

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of equipment accounts and, to a lesser degree, to the conducting transportation account. This latter account came to 14.47 cents per car-mile in 1925, compared with 14.54 cents in 1924. There was no decrease in wages in 1925; the average wage was in fact somewhat more than 1 per cent higher than in 1924. The decrease in the cost per car-mile, therefore, must be credited to a more efficient use of man-hours, and it is a very encouraging sign of progress.

Another indication that the companies are more alert and efficient in the management of their properties is found in the reduction in the number of car-miles run to conform with the reduced traffic.

Total revenue car-miles were reduced only 9,395,707. This indicates an increase in the mileage run in other than passenger service. This is undoubtedly due to the increased freight service which electric railways are known to be developing. The increase in non-passenger mileage is confined almost entirely to the interurban and combination city and interurban lines, with the straight interurban lines furnishing the greater part of it.

Classes of Companies Compared

When the group of companies is separated into its three classes it is found that all of the favorable factors were furnished by the city companies. The combination companies might be said to have about held their ground but the interurbans had to give way somewhat. The number of revenue passengers, for instance, decreased 2.55 per cent on the city lines, 3.81 per cent on the combination lines and 8.63 per cent on the interurban lines. Again, the operating revenue actually increased 0.22 per cent on the city lines, it decreased 3.96 per cent on the combination lines and it decreased 5.13 per cent on the interurbans. There is evidence, however, that the interurbans increased their freight revenue. Thus, while their passenger revenue decreased 7.98 per cent, their total operating revenue decreased only 5.13 per cent. This is also true of the combination lines. Their total revenues decreased only 3.96 per cent, while their passenger revenue alone was decreasing 4.98 per cent.

In the reduction of operating expenses, too, the interurbans made the best showing. They reduced their cost per car-mile 2.69 per cent, compared with a reduction of 0.72 per cent for the city lines and 0.83 per cent for the combination lines. The greatest reduction was effected by the interurbans in the maintenance of equipment account, 6.94 per cent, while the city companies made their greatest reduction in their power cost, 5.53 per cent. The combination companies effected the greatest reduction of expenses in their maintenance of way and structures, 3.05 per cent per car-mile, as against 2.71 per cent in their power. The interurbans also reduced their maintenance of way expense per car-mile 4.42 per cent, their power cost 6.70 per cent and their conducting transportation expense 0.08 per cent. The combination companies reduced their maintenance of equipment cost 1.17 per cent and their conducting transportation cost 2.66 per cent per car-mile. It is interesting to note in this connection that the only expense other than power that the city companies reduced was their maintenance of equipment, which decreased 4.45 per cent per car-mile. Their cost of conducting transportation increased 0.20 per cent and their maintenance of way 2.19 per cent per car-mile. Of still greater interest, perhaps, is the general increase in the amounts spent for the promotion of traffic by all types of com-

TABLE III—OPERATING STATISTICS—221 COMPANIES

	1925	1924	Increase or Decrease (D) Total	Per Cent
Passenger car-miles	1,182,404,436	1,193,154,462	(D) 10,750,026	(D) 0.91
Total revenue car-miles	1,219,236,302	1,228,632,009	(D) 9,395,707	(D) 0.77
Revenue passengers[1]	6,953,544,580	7,158,932,196	(D) 205,387,616	(D) 2.87
Transfer passengers[2]	1,726,122,971	1,723,682,296	2,440,675	0.14
Total passengers[1]	8,749,708,711	8,958,005,506	(D) 208,296,795	(D) 2.33
Passenger revenue	$508,882,806	$516,068,823	(D) $7,186,017	(D) 1.39
Revenue car-hours[3]	110,713,726	111,799,884	(D) 1,086,158	(D) 0.97
Passenger car-hours[3]	109,536,800	110,626,930	(D) 1,090,130	(D) 0.99
Miles of single track	23,484.91	23,576.23	(D) 91.32	(D) 0.39
Passenger cars operated[4] *a*	26,816	26,815		

a Average maximum number of passenger cars in service daily.
[1] Reported by 218 companies.
[2] Reported by 150 companies.
[3] Reported by 189 companies.
[4] Reported by 176 companies.

TABLE IV—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES—221 COMPANIES

	1925	1924	Per Cent Increase or (D) Decrease
Railway operating revenue	$546,259,829	$552,622,641	(D) 1.15
Per mile of single track	23,260	23,440	(D) 0.77
Gross income	$116,090,794	$114,602,722	1.30
Per mile of single track	$4,941	$4,861	1.65
Passenger revenue	$508,882,806	$516,068,823	(D) 1.39
Per revenue passenger	[1]7.1c.	[1]7.0c.	1.43
Per total passenger	[1]5.7c.	[1]5.7c.	
Per mile of single track	$21,668	$21,889	(D) 1.01
Per passenger car-mile	43.0c.	43.3c.	(D) 0.69
Per car operated	[2]$16,302	[2]$16,542	(D) 1.45
Per passenger car-hour	[3]$4.07	[3]$4.08	(D) 0.25
Revenue passengers	[1]6,953,544,580	[1]7,158,932,196	(D) 2.87
Per mile of single track	[1]307,463	[1]315,451	(D) 2.53
Per passenger car-mile	[1]6.0	[1]6.1	(D) 1.64
Per car operated	[4]226,859	[4]234,314	(D) 3.18
Per passenger car-hour	[5]59	[5]60	(D) 1.67
Total passengers	[1]8,749,708,711	[1]8,958,005,506	(D) 2.33
Per mile of single track	[1]386,884	[1]394,725	(D) 1.99
Per passenger car-mile	[1]7.6	[1]7.7	(D) 1.30
Ratio: Transfer passengers to revenue passengers (per cent)	24.8%	24.1%	2.90
Revenue car-miles	1,219,236,302	1,228,632,009	(D) 0.76
Per mile of single track	51,915	52,315	(D) 0.76
Per car operated	[2]38,914	[2]39,390	(D) 1.21
Per car-hour	[3]9.31	[3]9.29	0.22
Car-hours	[3]110,713,726	[3]111,799,884	(D) 0.97
Per car operated	[6]4,090	[6]4,145	(D) 1.33

[1] 218 companies. [2] 176 companies. [3] 189 companies. [4] 174 companies. [5] 186 companies. [6] 158 companies.

Part II—City Lines—Combined Reports of 96 Companies Operating City Lines Exclusively

TABLE V—COMBINED INCOME STATEMENT

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$378,513,379	$377,665,237	$848,142	0.22
Railway operating expense	277,743,129	280,246,398	(D) 2,503,269	(D) 0.89
Net operating revenue	$100,770,250	$97,418,839	$3,351,411	3.44
Net revenue: Auxiliary operations	662,528	668,527	(D) 5,999	(D) 0.90
Taxes	24,672,566	24,243,958	428,608	1.76
Operating income	$76,760,212	$73,843,408	$2,916,804	3.95
Non-operating income	5,212,242	4,605,458	606,784	13.17
Gross income	*a* $82,144,657	*b* $78,507,746	$3,636,911	4.63
Deductions from gross income	63,751,223	62,685,675	1,065,548	1.70
Net income	$18,393,434	$15,822,071	$2,571,363	16.25
Operating ratio, per cent	73.38	74.20	(D) 0.82	(D) 1.11
Ratio: Net income to operating revenue	4.86	4.18	0.68	16.26

a Includes $172,203 equalization income.
b Includes $58,880 equalization income.

TABLE VI—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$38,990,710	$38,212,613	$778,097	2.04
Equipment	35,969,086	37,719,579	(D) 1,750,493	(D) 4.64
Power	35,803,713	37,850,683	(D) 2,046,970	(D) 5.41
Conducting transportation	127,595,136	127,587,195	7,941	0.01
Traffic	799,015	629,635	169,380	26.90
General and miscellaneous	36,533,840	36,126,295	407,545	1.13
Transportation for investment—Cr.	—116,607	—131,339	(D) 14,732	(D) 11.22
Total operating expense	*a* $277,743,129	*b* $280,246,398	(D) $2,503,269	(D) 0.89

a Includes $2,168,236 undistributed expense.
b Includes $2,251,737 undistributed expense.

TABLE VII—OPERATING STATISTICS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	832,545,696	834,024,876	(D) 1,479,180	(D) 0.18
Total revenue car-miles	836,591,328	838,047,485	(D) 1,456,157	(D) 0.17
Revenue passengers	5,424,784,581	5,566,644,528	(D) 141,859,947	(D) 2.55
Transfer passengers[1]	1,577,724,303	1,563,418,639	14,305,664	0.91
Total passengers	7,041,296,156	7,170,501,884	(D) 129,205,728	(D) 1.80
Passenger revenue	$369,248,085	$368,618,666	$629,419	0.17
Revenue car-hours[2]	81,572,794	81,794,120	(D) 221,326	(D) 0.27
Passenger car-hours[2]	81,369,105	81,580,791	(D) 211,686	(D) 0.26
Miles of single track	10,508.29	10,536.41	(D) 28.12	(D) 0.27
Passenger cars operated[3] *a*	20,024	19,883	141	0.71

a Average maximum number of passenger cars in service daily. [1] Reported by 79 companies. [2] Reported by 87 companies. [3] Reported by 83 companies.

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panies. The total amount spent by the three groups was $2,144,047, an increase of $387,505 over 1924. The increase for the city companies was 26.90 per cent, for the interurbans 19.40 per cent and for the combination companies 19.34 per cent. This would seem to indicate that all companies were paying more attention to advertising and the development of new business generally.

In spite of the very substantial reduction in the operating expenses of the interurban companies the operating ratio of the group rose from 83.75 to 84.61 per cent. This, of course, was due to the decrease in traffic and revenue which was greater than the decrease in expenses. The city lines having both an increase in revenue and a decrease in expenses, their operating ratio dropped from 74.20 to 73.38 per cent, the lowest ratio of the three groups. The change in the combination lines was, as it naturally would be, midway between the other two, their operating ratio rising slightly from 76.08 per cent to 76.90 per cent.

Taxes on City Lines Increased

The taxes of the city lines increased 1.76 per cent, but those of the two other groups declined, 6.50 per cent in the case of the interurbans and 1.14 per cent in the case of the combination companies.

Fixed charges followed the same course among the groups. There was in increase of 1.70 per cent for the city companies and decreases of 1.14 per cent and 7 per cent respectively for the interurban and combination companies.

These minor advantages of these two groups did not, however, begin to equal the initial advantage in the net results from operations enjoyed by the city lines. Consequently while the net income of the city lines registered a substantial increase, that of the two other groups fell off slightly. The net corporate income of the city lines amounted to $18,393,434, an increase of $2,571,363, or 16.25 per cent, over 1924.

The interurban lines closed the year with a deficit of $1,270,856, which was an increase of $126,702 compared with 1924. The net income of the combination lines amounted to $3,933,256, a decrease of $19,510, or 0.49 per cent, under 1924.

It is of more than passing interest to note in connection with the above figures that the interurban group was the only one of the three to show an increase in track mileage. The increase was only 10.58 miles, but it compares

Part III—Interurban Lines—Combined Reports of 49 Companies Operating Interurban Lines Exclusively

TABLE VIII—INCOME STATEMENT OF 49 ELECTRIC RAILWAYS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$22,669,875	$23,896,461	(D) $1,226,586	(D) 5.13
Railway operating expense	19,181,568	20,013,193	(D) 831,625	(D) 4.16
Net operating revenue	$3,488,307	$3,883,268	(D) $394,961	(D) 10.17
Net revenue: Auxiliary operations	1,568,608	1,401,166	167,442	11.95
Taxes	1,171,137	1,252,498	(D) 81,361	(D) 6.50
Operating income	$3,885,778	$4,031,936	(D) $146,158	(D) 3.63
Non-operating income	349,530	393,364	(D) 43,834	(D) 11.14
Gross income	$4,235,308	$4,425,300	(D) $189,992	(D) 4.29
Deductions from gross income	5,506,164	5,569,454	(D) 63,290	(D) 1.14
Net income	*$1,270,856	*$1,144,154	*$126,702	.....
Operating ratio, per cent	84.61	83.75	0.86	1.03
Ratio: Net income to operating revenue	.....	.....	.....	.....

*Deficit.

TABLE IX—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$3,716,154	$3,949,402	(D) $233,248	(D) 5.91
Equipment	2,309,722	2,516,528	(D) 206,806	(D) 8.22
Power	3,392,689	3,690,545	(D) 297,856	(D) 8.07
Conducting transportation	5,986,621	6,083,884	(D) 97,263	(D) 1.60
Traffic	351,748	294,580	57,168	19.40
General and miscellaneous	3,437,820	3,485,661	(D) 47,841	(D) 1.37
Transportation for investment—Cr	—14,273	—10,191	4,082	40.05
Total operating expense	a$19,181,568	b$20,013,193	(D) $831,625	(D) 4.16

a Includes $1,087 undistributed expense.
b Includes $2,784 undistributed expense.

TABLE X—OPERATING STATISTICS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	38,010,213	39,494,142	(D) 1,483,929	(D) 3.76
Total revenue car-miles	47,762,458	48,490,250	(D) 727,792	(D) 1.50
Revenue passengers[1]	54,653,444	59,815,956	(D) 5,162,512	(D) 8.63
Transfer passengers[2]	1,086,556	1,150,161	(D) 63,605	(D) 5.53
Total passengers[1]	57,385,061	62,586,043	(D) 5,200,982	(D) 8.31
Passenger revenue	$14,305,650	$15,545,349	(D) $1,239,699	(D) 7.98
Revenue car-hours[3]	1,768,776	1,824,661	(D) 55,885	(D) 3.06
Passenger car-hours[3]	1,400,904	1,469,075	(D) 68,171	(D) 4.64
Miles of single track	3,027.87	3,017.29	10.58	0.35
Passenger cars operated[4] a	473	468	5	1.06

a Average maximum number of passenger cars in service daily. [1] Reported by 48 companies. [2] Reported by 12 companies. [3] Reported by 35 companies. [4] Reported by 36 companies.

Part IV—City and Interurban Lines—Combined Reports of 76 Companies Operating Combined City and Interurban Lines

TABLE XI—INCOME STATEMENT

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$145,076,575	$151,060,943	(D) $5,984,368	(D) 3.96
Railway operating expense	111,560,450	114,927,439	(D) 3,366,989	(D) 2.93
Net operating revenue	$33,516,125	$36,133,504	(D) $2,617,379	(D) 7.24
Net revenue: Auxiliary operations	1,706,664	1,508,343	198,321	13.15
Taxes	9,153,315	9,258,318	(D) 105,003	(D) 1.14
Operating income	$26,069,474	$28,383,529	(D) $2,314,055	(D) 8.15
Non-operating income	3,641,355	3,286,147	355,208	10.81
Gross income	$29,710,829	$31,669,676	(D) $1,958,847	(D) 6.19
Deductions from gross income	25,777,573	27,716,910	(D) 1,939,337	(D) 7.00
Net income	$3,933,256	$3,952,766	(D) $19,510	(D) 0.49
Operating ratio, per cent	76.90	76.08	0.82	1.08
Ratio: Net income to operating revenue	2.71	2.62	0.09	3.43

TABLE XII—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$18,126,318	$19,084,896	(D) $958,578	(D) 5.02
Equipment	14,096,686	14,563,742	(D) 467,056	(D) 3.21
Power	16,826,400	17,671,281	(D) 844,881	(D) 4.78
Conducting transportation	42,869,872	44,985,423	(D) 2,115,551	(D) 4.70
Traffic	993,284	832,327	160,957	19.34
General and miscellaneous	17,824,586	17,428,509	396,077	2.27
Transportation for investment—Cr	—256,580	—199,452	57,128	28.64
Total operating expenses	a$111,560,450	b$114,927,439	(D) $3,366,989	(D) 2.93

a Includes $1,079,884 undistributed expense.
b Includes $560,713 undistributed expense.

TABLE XIII—OPERATING STATISTICS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	311,848,527	319,635,444	(D) 7,786,917	(D) 2.44
Total revenue car-miles	334,882,516	342,094,274	(D) 7,211,758	(D) 2.11
Revenue passengers[1]	1,474,106,555	1,532,471,712	(D) 58,365,157	(D) 3.81
Transfer passengers[2]	147,312,112	159,113,496	(D) 11,801,384	(D) 7.42
Total passengers[1]	1,651,027,494	1,724,917,579	(D) 73,890,085	(D) 4.28
Passenger revenue	$125,329,071	$131,904,808	(D) 6,575,737	(D) 4.98
Revenue car-hours[3]	27,372,156	28,181,103	(D) 808,947	(D) 2.87
Passenger car-hours[3]	26,766,791	27,577,064	(D) 810,273	(D) 2.94
Miles of single track	9,948.75	10,022.53	(D) 73.78	(D) 0.74
Passenger cars operated[4] a	6,319	6,464	(D) 145	(D) 2.24

a Average maximum number of passenger cars in service daily. [1] Reported by 74 companies. [2] Reported by 59 companies. [3] Reported by 67 companies. [4] Reported by 57 companies.

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Part V—Combined Statements of All Three Types of Companies on a Car-Mile Basis

TABLE XIV—INCOME STATEMENT OF 96 CITY COMPANIES, 49 INTERURBAN COMPANIES AND 76 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

	City Lines			Interurban Lines			City and Interurban Lines		
	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease
	1925	1924		1925	1924		1925	1924	
Railway operating revenue	45.24	45.06	0.39	47.46	49.28	(D) 3.70	43.32	44.16	(D) 1.91
Railway operating expense	33.20	33.44	(D) 0.72	40.16	41.27	(D) 2.69	33.31	33.50	(D) 0.84
Net operating revenue	12.04	11.62	3.61	7.30	8.01	(D) 8.86	10.01	10.56	(D) 5.21
Net revenue: Auxiliary operations	0.08	0.08	.....	3.28	2.88	13.89	0.51	0.44	15.90
Taxes	2.93	2.89	1.38	2.45	2.58	(D) 5.04	2.73	2.71	0.74
Operating income	9.17	8.81	4.08	8.13	8.31	(D) 2.17	7.78	8.30	(D) 6.27
Non-operating income	0.62	0.55	12.72	0.73	0.81	(D) 9.88	1.00	0.96	13.54
Gross income	9.89	9.37	5.55	8.86	9.13	(D) 2.96	8.87	9.26	(D) 4.21
Deductions from gross income	7.62	7.49	1.73	11.53	11.48	0.43	7.69	8.10	(D) 5.07
Net income	2.20	1.89	16.40	*2.66	*2.36	.....	1.17	1.15	1.73

TABLE XV—OPERATING EXPENSES OF 96 CITY COMPANIES, 49 INTERURBAN COMPANIES AND 76 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

	City Lines			Interurban Lines			City and Interurban Lines		
	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease	Cents per Car-Mile		Per Cent Increase or (D) Decrease
	1925	1924		1925	1924		1925	1924	
Way and structures	4.66	4.56	2.19	7.78	8.14	(D) 4.42	5.41	5.58	(D) 3.05
Equipment	4.30	4.50	(D) 4.45	4.83	5.19	(D) 6.94	4.21	4.26	(D) 1.17
Power	4.27	4.52	(D) 5.53	7.10	7.61	(D) 6.70	5.02	5.16	(D) 2.71
Conducting transportation	15.25	15.22	0.20	12.53	12.54	(D) 0.08	12.80	13.15	(D) 2.66
Traffic	0.09	0.08	12.50	0.74	0.61	21.31	0.29	0.24	20.83
General and miscellaneous	4.36	4.31	1.16	7.19	7.19	.....	5.32	5.09	4.52
Transportation for Invest.—Cr.	0.01	0.01	.....	0.03	0.02	50.00	0.08	0.06	33.33
*Total operating expenses	33.20	33.44	(D) 0.72	40.16	41.27	(D) 2.69	33.31	33.59	(D) 0.83
*Undistributed expenses included in total	0.26	0.27	.....	.....	.....	.....	0.32	0.16	.....

*Deficit.

with a decrease of 28.12 miles for the city lines and 73.78 miles for the combination group.

Further Analysis

The most striking point that is brought out where the groups of companies are further subdivided according to the sizes of the companies is that the medium-sized city companies, those earning from $250,000 to $1,000,000 a year, made the greatest improvement in 1925. They changed a deficit of $416,505 in 1924 into a net corporate income of $519,070, a net change of $935,575. Their operating ratio was reduced from 82.33 per cent to 79.15 per cent. The sources of this improvement are found principally in a substantial reduction in operating expenses and in a really remarkable reduction of 21.01 per cent in their fixed charges. They saved a total of $451,403 by this reduction, which would indicate that they had made radical and successful changes in their financial structures. They also increased their track mileage by 13.72 miles.

The large city companies are of course in the strongest position. They reduced their operating ratio from 73.81 per cent to 73.07 per cent and increased their net corporate income by $1,679,682, or 10.27 per cent.

Status of Small City Companies Unchanged

The city companies earning less than $250,000 a year did not change their condition materially during the year. They had a deficit of $117,320 in 1924. This increased to $161,214 in 1925. Their operating ratio remained unchanged at 86.23 per cent in both years.

In the interurban group the large companies reduced their operating ratio from 83.76 to 83.57 and a deficit of $56,826 in 1924 to one of $2,812 in 1925. The medium and small sized companies, however, failed to show any improvement. Both these groups returned increased deficits and higher operating ratios. Loss of traffic was the source of their troubles.

Pretty much the same conditions prevailed among the combination companies. The large companies in this group earned a net income of $5,606,933, a decrease of $159,967, or 2.77 per cent. The operating ratio rose from 74.72 per cent to 75.65 per cent. The small companies reported an increased deficit and a higher operating ratio, but the medium-sized companies reduced a deficit of $1,525,726 in 1924 to $1,345,524 in 1925.

In the analysis of the income statement as compiled by the association and contained in Part VII of that record detailed figures were given of the income statements of the various groups, of the operating expenses by primary accounts and of the operating statistics.

Part VI—Derived Ratios

TABLE XVI—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES

	96 City Companies			49 Interurban Companies			76 Companies Operating Both City and Interurban Lines		
	1925	1924	Per Cent Increase or (D) Decrease	1925	1924	Per Cent Increase or (D) Decrease	1925	1924	Per Cent Increase or (D) Decrease
Railway operating revenue	$378,513,379	$377,665,237	0.22	$22,669,875	$23,896,461	(D) 5.13	$145,076,575	$151,060,943	(D) 3.96
Per mile of single track	$36,020	$35,844	0.49	$7,487	$7,919	(D) 5.46	$14,582	$15,072	(D) 3.25
Gross income	$82,144,657	$78,507,746	4.63	$4,235,398	$4,425,390	(D) 4.29	$29,710,829	$31,669,676	(D) 6.19
Per mile of single track	$7,817	$7,451	4.91	$1,399	$1,467	(D) 4.64	$2,986	$3,160	(D) 5.51
Passenger revenue	$369,248,085	$368,618,666	0.17	$14,305,650	$15,545,349	(D) 7.97	$125,329,071	$131,934,808	(D) 4.99
Per revenue passenger	6.8c.	6.6c.	3.03	[1]23.6c.	[1]23.4c.	0.85	[2]7.8c.	[2]7.9c.	(D) 1.27
Per total passenger	5.2c.	5.1c.	1.96	[1]22.5c.	[1]22.4c.	0.45	[2]6.9c.	[2]7.0c.	(D) 1.42
Per mile of single track	$35,139	$34,985	0.44	$4,725	$5,152	(D) 8.29	$12,597	$13,161	(D) 4.29
Per passenger car-mile	44.4c.	44.2c.	0.45	37.6c.	39.4c.	(D) 4.57	41.2c.	41.3c.	(D) 2.66
Per car operated	[3]$15,972	[3]$16,061	(D) 0.56	[4]$21,165	[4]$23,046	(D) 8.16	[5]$16,984	[5]$17,551	(D) 3.23
Per passenger car-hour	[6]$4.09	[6]$4.08	0.25	[7]$6.13	[7]$6.20	(D) 1.13	[8]$3.90	[8]$3.99	(D) 2.26
Revenue passengers	5,424,784,581	5,566,644,528	(D) 2.55	[1]54,653,956	[1]59,815,956	(D) 8.63	[2]1,474,106,555	[2]1,532,471,712	(D) 3.81
Per mile of single track	516,238	528,325	(D) 2.29	[1]18,695	[1]20,536	(D) 8.96	[2]160,508	[2]165,760	(D) 3.17
Per passenger car-mile	6.5	6.7	(D) 2.99	[1]1.6	[1]1.7	(D) 5.88	[2]5.1	[2]5.2	(D) 1.92
Per car operated	[3]227,662	[3]237,516	(D) 4.15	[4]92,493	[4]102,365	(D) 9.64	[9]229,937	[9]233,982	(D) 1.73
Per passenger car-hour	[6]60	[6]62	(D) 3.23	[10]37	[10]39	(D) 5.13	[11]56	[11]56	.....
Total passengers	7,041,296,156	7,170,501,884	(D) 1.80	[1]57,385,061	[1]62,586,043	(D) 8.31	[2]1,651,027,494	[2]1,724,917,579	(D) 4.28
Per mile of single track	670,070	680,545	(D) 1.54	[1]19,630	[1]21,487	(D) 8.64	[2]179,768	[2]186,576	(D) 3.65
Per passenger car-mile	8.5	8.6	(D) 1.16	[1]1.7	[1]1.7	.....	[2]5.7	[2]5.8	(D) 1.72
Ratio: Transfer to revenue passengers (per cent)	29.1	28.1	3.56	2.0	1.9	5.26	10.0	10.4	(D) 3.85
Revenue car-miles	836,591,328	838,047,485	(D) 0.17	47,762,458	48,490,250	(D) 1.50	334,882,516	342,094,274	(D) 2.11
Per mile of single track	79,613	79,538	0.09	15,774	16,071	(D) 1.85	33,661	34,133	(D) 1.38
Per car operated	[3]36,343	[3]36,812	(D) 1.28	[4]68,365	[4]70,117	(D) 2.50	[5]44,863	[5]45,094	(D) 0.51
Per car-hour	[6]9.0	[6]9.0	.....	[7]14.2	[7]13.8	3.06	[8]9.8	[8]9.8	.....
Car-hours	[6]81,572,794	[6]81,794,120	(D) 0.27	[7]1,768,775	[7]1,824,661	(D) 3.06	[8]27,372,156	[8]28,181,193	(D) 2.89
Per car operated	[12]3,974	[12]4,015	(D) 1.02	[13]9,964	[13]9,646	3.30	[14]4,334	[14]4,431	(D) 2.17

[1]48 companies. [2]74 companies. [3]83 companies. [4]36 companies. [5]57 companies. [6]87 companies. [7]35 companies. [8]67 companies. [9]55 companies. [10]34 companies. [11]65 companies. [12]76 companies. [13]29 companies. [14]53 companies.

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Part VII—Analysis of Income Statement

TABLE XVII—ANALYSIS OF OPERATING STATEMENT—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
	44 Cos. With Revenues of More Than $1,000,000 per Year Each	25 Cos. With Revenues of $250,000 to $1,000,000 per Year Each	27 Cos. With Revenues of Less Than $250,000 per Year Each	6 Cos. With Revenues of More Than $1,000,000 per Year Each	23 Cos. With Revenues of $250,000 to $1,000,000 per Year Each	20 Cos. With Revenues of Less Than $250,000 per Year Each.	26 Cos. With Revenues of More Than $1,000,000 per Year Each	28 Cos. With Revenues of $250,000 to $1,000,000 per Year Each	22 Cos. With Revenues of Less Than $250,000 per Year Each
Railway operating revenue	0.26	0.02	(D) 3.12	(D) 5.13	(D) 3.19	(D) 14.66	(D) 3.60	(D) 5.58	(D) 10.60
Railway operating expense	(D) 0.75	(D) 3.85	(D) 3.12	(D) 5.34	(D) 1.38	(D) 12.65	(D) 2.39	(D) 5.52	(D) 8.36
Net operating revenue	3.09	18.03	(D) 3.10	(D) 4.01	(D) 11.91	(D) 30.05	(D) 7.17	(D) 5.91	(D) 36.73
Net revenue: Auxiliary operations	1.39	(D) 7.49	(D) 63.07	13.15	(D) 11.47	(D) 3.42	11.63	30.20	437.27
Taxes	2.08	(D) 6.43	3.90	(D) 7.42	(D) 4.41	(D) 12.62	(D) 1.02	(D) 0.43	(D) 14.18
Operating income	3.41	29.47	(D) 8.76	6.23	(D) 15.08	(D) 47.44	(D) 8.06	(D) 7.26	(D) 56.38
Non-operating income	14.18	0.23	(D) 46.93	(D) 1.66	(D) 29.94	(D) 23.21	13.99	(D) 5.15	(D) 25.47
Gross income	4.18	27.96	(D) 16.28	5.46	(D) 16.13	(D) 44.00	(D) 5.94	(D) 6.88	(D) 47.20
Deductions from gross income	2.52	(D) 21.01	(D) 0.52	3.34	(D) 6.82	2.84	(D) 6.73	(D) 8.73	(D) 5.20
Net income	10.27	.....	.....	.....	.....	.....	(D) 2.77	.....	.....
Operating ratio (per cent)	(D) 1.01	(D) 3.86	.....	(D) 0.23	1.87	2.36	1.24	0.07	2.51
Ratio: Net income to operating revenue	9.93	.....	.....	.....	.....	.....	0.90	.....	.....

TABLE XVIII—OPERATING EXPENSES BY PRIMARY ACCOUNTS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Way and structures	2.73	(D) 13.83	(D) 3.96	(D) 6.39	(D) 4.81	(D) 9.00	(D) 3.47	(D) 13.18	(D) 8.28
Equipment	(D) 4.57	(D) 5.87	(D) 6.56	(D) 11.19	(D) 5.55	(D) 8.21	(D) 3.48	(D) 1.05	(D) 5.68
Power	(D) 6.04	6.62	(D) 1.36	(D) 4.53	(D) 4.06	(D) 33.57	(D) 4.59	(D) 4.67	(D) 11.33
Conducting transportation	0.22	(D) 5.24	(D) 2.57	(D) 3.81	2.02	(D) 7.76	(D) 4.57	(D) 5.14	(D) 8.03
Traffic	32.09	(D) 14.06	(D) 55.31	24.20	9.02	68.15	19.37	23.18	(D) 10.29
General and miscellaneous	1.21	(D) 0.72	3.11	(D) 5.56	1.95	(D) 6.11	3.19	(D) 1.72	(D) 6.84
Transportation for investment—Cr	(D) 11.27	81.94	.....	(D) 34.33	58.40	.....	10.72	.....	58.33
Total operating expense	(D) 0.75	(D) 3.85	(D) 3.12	(D) 5.34	(D) 1.38	(D) 12.65	(D) 2.39	(D) 5.52	(D) 8.36

TABLE XIX—OPERATING STATISTICS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Passenger car-miles	(D) 0.17	(D) 0.05	(D) 0.98	(D) 5.89	(D) 0.48	(D) 6.87	(D) 2.72	(D) 0.39	(D) 4.60
Total revenue car-miles	(D) 0.17	(D) 0.07	(D) 1.08	(D) 4.68	2.54	(D) 6.75	(D) 2.26	(D) 0.66	(D) 5.41
Revenue passengers	(D) 2.56	(D) 1.98	(D) 4.29	(D) 9.47[9]	(D) 5.82	(D) 13.45	(D) 3.23[19]	(D) 6.92	(D) 10.28
Transfer passengers	1.03[1]	(D) 3.94[4]	(D) 8.71[6]	(D) 9.05[10]	(D) 2.98[13]	(D) 8.82[16]	(D) 8.04[20]	(D) 2.16[22]	(D) 11.35[24]
Total passengers	(D) 1.76	(D) 2.19	(D) 5.11	(D) 9.13[9]	(D) 5.48	(D) 13.22	(D) 3.86[19]	(D) 6.52	(D) 10.43
Passenger revenue	0.23	(D) 0.84	(D) 2.98	(D) 9.31	(D) 6.31	(D) 9.58	(D) 4.72	(D) 5.84	(D) 12.37
Revenue car-hours	(D) 0.21[2]	(D) 0.92[4]	(D) 2.39[7]	(D) 4.33[11]	(D) 0.44[14]	(D) 8.59[17]	(D) 2.74[20]	(D) 2.92[22]	(D) 6.94[25]
Passenger car-hours	(D) 0.20[2]	(D) 0.92[4]	(D) 2.34[7]	(D) 4.20[11]	(D) 3.22[14]	(D) 8.23[17]	(D) 2.82[20]	(D) 2.94[23]	(D) 6.99[25]
Miles of single track	(D) 0.44	1.59	(D) 0.09	0.02	0.66	(D) 0.10	(D) 0.57	(D) 0.84	(D) 2.84
Passenger cars operated *a*	0.76[8]	(D) 0.23[5]	(D) 0.55[8]	4.31[12]	2.04[15]	(D) 10.34[18]	(D) 1.94[21]	(D) 4.09[23]	(D) 7.83[26]

a Average maximum number of passenger cars in service daily.

[1] Reported by 41 companies.
[2] Reported by 42 companies.
[3] Reported by 35 companies.
[4] Reported by 22 companies.
[5] Reported by 23 companies.
[6] Reported by 16 companies.
[7] Reported by 23 companies.
[8] Reported by 25 companies.
[9] Reported by 5 companies.
[10] Reported by 1 company.
[11] Reported by 2 companies.
[12] Reported by 3 companies.
[13] Reported by 8 companies.
[14] Reported by 16 companies.
[15] Reported by 19 companies.
[16] Reported by 3 companies.
[17] Reported by 17 companies.
[18] Reported by 14 companies.
[19] Reported by 24 companies.
[20] Reported by 22 companies.
[21] Reported by 19 companies.
[22] Reported by 25 companies.
[23] Reported by 20 companies.
[24] Reported by 12 companies.
[25] Reported by 20 companies.
[26] Reported by 18 companies.

These are of considerable value as an extension of the accounts under the various groups of properties, but on account of space limitations it was decided not to show the totals or the amount of the increase or decrease, but merely the per cent of increase. This method of treatment has made it possible to combine into three tables a series of figures that, as carried out in full in the original compilation, cover 27 tables.

Connecticut Interurban Sold Under Foreclosure

The Hartford & Springfield Street Railway, Warehouse Point, Conn., at a sale held on April 27, passed into the hands of the protective committee of bondholders headed by Francis R. Cooley, Hartford, Conn. Mr. Cooley bid $10,000 for the property, franchises and rolling stock of the company. No other bids were received. The sale was recorded as a personal one. The sale was held to foreclose a mortgage of $600,000 with interest amounting to $260,000, making the total debt $860,000.

Mr. Cooley accepted the property subject to a prior mortgage of $161,000 on the Windsor Locks Traction Company property, taxes of $72,000, receiver's certificates of $125,000 and a reservation of $25,000 for possible judgments against the company .

Terms of the plan under which the company will be reorganized have not been announced.

Deficit in Des Moines

For the year ended Dec. 31, 1925, the Des Moines City Railway, Des Moines, Iowa, reports a deficit of $18,114 after the consideration of dividends on preferred stock. The net earnings were 2.70 times annual bond interest charges. The company operated under a service-at-cost franchise with fares increased on Oct. 1, 1925, to 10 cents cash, 9½-cent ticket, children 5 cents and school children 2½ cents. The accompanying table gives the income account for last year.

INCOME ACCOUNT OF THE DES MOINES CITY RAILWAY FOR THE TWELVE MONTHS ENDED DEC. 31, 1925

Revenue	
Passenger	$2,248,092
Other	96,945
Total	$2,345,037
Operating expenses and taxes	
Operating expenses	1,541,176
Taxes	152,000
Total	$1,693,176
Net earnings	$651,860
Deductions	
Interest on bonds	241,050
Other interest	83,531
Other charges	7,768
Total	$332,350
Balance	$319,510
Depreciation reserve	217,000
Balance	$102,510
Dividends — Preferred stock	120,625
Deficit	$18,114

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Legal Notes

FEDERAL SUPREME COURT—*Steam Railroads Required to Establish Through Routes and Joint Rates and to Interchange Switching Service with Electric Railway*

Four steam railroads entering Michigan City, Ind., refused to establish through routes and joint rates and to interchange switching service with the Chicago, Lake Shore & South Bend Railway, an electric road also entering that city. After a hearing, the Interstate Commerce Commission directed the steam railroads to remove this discrimination which it termed unjust, and the present case was the result of a request by the steam railroads for an injunction, relieving them from complying with the order of the commission. Of the four steam railroads, only one had physical connection with the electric railway, but the court held this fact did not invalidate the order of the commission as to all four roads. The claims that the electric railroad would originate relatively little business, that its service was essentially dissimilar and other objections were overruled by the court, in view of the order of the commission, for whose judgment the court said it would not substitute its own. [Chicago, I. & L. Railway et al, vs. United States et al. 46 Supreme Court Rep., 226.]

ILLINOIS—*Court Will Reverse Issue of Certificate by Commission If Not Justified by Evidence*

In this case the Illinois Commerce Commission granted a certificate of convenience and necessity to a bus line for a route then being served by another bus company, which presented evidence to show that it was giving all of the service practicable for the traffic and there was not enough to justify the operation of two lines. The Supreme Court of Illinois accepted this view and declared the issue of the certificate void on the ground that the action of the Commission was unreasonable, arbitrary and confiscatory. [Superior Motor Bus Co. vs. Community Motor Bus Co., 150 Northeast. Rep., 668.]

INDIANA — *Carrier's Liability When Car Is Attacked by Highwaymen*

An interurban car was boarded by two highwaymen, who intimidated the crew and passengers and robbed the latter. One of the passengers brought suit against the company because of loss suffered and injuries received. The Supreme Court of Indiana, in reversing a judgment for the plaintiff declared a railroad is not an insurer of the safety of its passengers, as against the consequences of felonious acts done by persons not in its employ and over whom it has not control. The employees in charge of a train must afford passengers protection against such attacks when the employees have the means for such prevention or by the exercise of reasonable care could have provided themselves with the means or could have prevented the attack. In this case, no such failure or refusal was shown. [Terre Haute I. & E. T. Co. vs. Scott, 150 Northeast. Rep., 777.]

KENTUCKY — *Duty of Person at an Interurban Crossing.*

The Kentucky law does not require a person crossing a railroad track in that state to stop, look and listen, but only to exercise the care of a reasonably prudent man under similar circumstances. [Bohmer's Adm'x vs. K. T. & T. Co., 279 Southwest. Rep., 955.]

MARYLAND — *Obligation to Maintain Bridge under Heavy Traffic.*

A railway company constructing its track over private right-of-way which crossed certain streets received permission from the city to construct a cut for its track provided it would build and "at all times thereafter" maintain a substantial bridge for one of the streets crossed, the bridge to be like a drawing which was made part of the permission granted. Such a bridge was built, but, after 16 years, traffic increased greatly and for this reason, and because it wished to lay water mains over the bridge, the city asked the railway to strengthen it. It was held that the railway was not obliged to do more than maintain a bridge of the light character originally constructed. [City of Baltimore vs. Washington, B. & A. Elec. Ry., 132 Atlantic Rep., 269.]

NEW JERSEY — *City Must Conform to Own Ordinance in Granting Bus License.*

A city had passed an ordinance which required applicants for bus licenses to file information on a number of points and declared that such licenses would be granted only when necessary or advisable in the interests of the public. Later, the city granted a license to an applicant who did not give all the information called for in the ordinance, and there was no determination as to the advisability or necessity of the line. In consequence, the Supreme Court of New Jersey set aside the license. [Bergen Bus Line vs. Hackensack Improvement Commission, 132 Atlantic Rep., 296.]

NEW JERSEY—*Injury to Lineman without Rubber Gloves.*

A lineman employed by a city to repair the fire alarm system attempted to clear wires after a storm without wearing rubber gloves, and was injured from excessive voltage from an electric power wire. His action was held to be contributory negligence. [Brice vs. Atlantic Coast E. R. Co. et al., 132 Atlantic Rep., 253.]

NEW YORK—*Railway Not Liable to Pass Rider When Carried Beyond Point to which Pass Was Good.*

The plaintiff was an employee of the city and had a pass permitting him to ride without charge between certain points on a trolley line crossing a bridge but freeing the company in case of accident. The car on which the plaintiff was riding escaped from control and he was injured, but not until the car had run past the point to which the pass was valid. The company was held not liable as the injured person had not become a passenger from whom fare was due. [Hester vs. Manhattan Bridge 3-Cent Line, 212 New York Supp., 292.]

NEW YORK—*Improper Questions of Plaintiff's Counsel Held to Require New Trial.*

A person injured in an accident with a trolley car received judgment in the trial court. In that trial the plaintiff's counsel asked the motorman if he was a "strike breaker" and other questions which were held to be prejudicial to the defendant, and a new trial was granted. [Romeo vs. United Traction Co., 212 New York Supp., 435.]

NEW YORK—*Railroad Failing to Begin Construction.*

The section in the railroad laws providing that the corporate existence of railroads failing to begin construction within five years after filing a certificate of incorporation shall cease, applies to surface street railways. [Hanbury vs. Metropolitan Securities Co., 213 New York Supp., 555.]

PENNSYLVANIA—*Duty of Pedestrian at Street Crossing.*

At a street crossing in a city, it is not contributory negligence for a pedestrian to cross the street while a car is approaching. He has a right to assume that the motorman will approach the intersection with due caution. [Murphy vs. P. R. T. Co., 132 Atlantic Rep., 194.]

WASHINGTON—*Bus Not Liable for Injury to Unlighted Truck.*

The driver of a truck who had continued driving after dark without lights and had stalled on a curve on the highway was held guilty of contributory negligence sufficient to prevent a recovery for injury to a fellow employee who was assisting him in the operation of the truck. [Martin vs. Puget Sound Elec. Ry., 241 Pacific Rep., 360.]

WASHINGTON — *Qualification of Rule That Company Is Not Responsible for Injury to Pedestrian Caused by Overhang of Car on a Curve*

In Gannaway v. Puget Sound P., L. & T. Co. (138 P., 267) it was held not to be the duty of street railway companies to warn pedestrians on the street that there is an overhang to an ordinary street car when it rounds a curve. In the present case, at a crossing which was protected by a traffic officer and signals, a pedestrian started to make the crossing at a time when the signals gave permission to do so. When half way across, the crossing signal was changed, and the pedestrian took what she thought was a safe position away from the car track, though in the middle of the street, but was struck by the overhang of the car, which was waiting at the corner and started to go around a curve at the signal of the traffic officer. In these circumstances, the court held that the question of the pedestrian's contributory negligence should have been submitted to a jury. [White et ux, vs. City of Seattle, 240 Pacific Rep., 903.]

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Personal Items

J. D. Hallman Back in Service at Atlanta

J. D. Hallman, a pioneer in railway transportation in Atlanta, Ga., was named president of the Georgia Railway & Electric Company on April 19, succeeding Thomas K. Glenn, retiring head of the company, the properties of which are at present leased to the Georgia Railway & Power Company. Mr. Hallman is 84 years old.

Going to Atlanta soon after the war between the states, Mr. Hallman entered the mercantile business. When the first horse car line was established from the west end to the heart of the city he was an active backer of the enterprise. With the late Joel Hurt, he was one the pioneer citizens who established the first electric line between Inman Park and Five Points. Mr. Hallman served for many years on the board of directors of the Georgia Railway & Power Company, but had been in retirement from active business life for several years.

At the same meeting James D. Robinson was elected vice-president of the Georgia Railway & Electric Company. Mr. Robinson is president of one of Atlanta's oldest and best-known business organizations, and is also vice-president and a director of the Fourth National Bank. For many years he has been a director of the Georgia Railway & Power Company.

W. H. Wright, secretary of the company, was elected a director to fill the place made vacant by the resignation of Mr. Glenn.

Changes in Capital Traction at Washington

H. D. Crampton, secretary and treasurer of the Capital Traction Company, Washington, D. C., has been elected a vice-president by the board of directors. Mr. Crampton will continue to serve as secretary and treasurer. He has been with the company for more than 30 years.

J. E. Heberle, who has been assistant secretary of the company for several years, has been made assistant to the president.

J. Fleming, purchasing agent, has been made assistant secretary, but will continue as purchasing agent.

Former Governor Heads West Virginia Interurban

W. A. MacCorkle, now the president of the Charleston Interurban Railroad, Charleston, W. Va., is a new figure in the electric railway field, although he has engaged in railroad building for many years. It was through his earnest efforts that the Coal River Railroad and the Elk River branch of the Baltimore & Ohio were built. In connection with his work in land development, bridge-building and railroad work he has published many books on these subjects.

By profession Mr. MacCorkle is a lawyer, and he has been active in public life. He was Governor of the state of West Virginia and state Senator and has served a number of commissions. In his capacity as president of the Charleston Interurban Railroad he succeeds the late F. M. Staunton. Mr. MacCorkle has also been made chairman of the board of that company.

Arthur M. Hill Advanced at Charleston

Arthur M. Hill, the new vice-president and general manager of the Charleston Interurban Railroad at Charleston, W. Va., is a well-known figure in the railway and bus field. Last year he was elected president of the state bus operators' organization, having served as chairman of the West Virginia Motor Transportation Association's committee on legislation. When the Bus Division of the American Automobile Association was formed on March 19 as the national organization of bus operators, he was elected its first chairman.

A. M. Hill

Mr. Hill, formerly treasurer, will now have charge of the Charleston Interurban Railroad's transportation system, including its bus lines. He succeeds I. N. Smith, who had been general manager, but who will now be secretary and treasurer. Mr. Hill is a native of Charleston, but spent a large part of his boyhood in the state of Arizona. He enrolled at the University of Missouri, and after completing his studies engaged for a period of seven years in the banking business at Charleston. From this work he entered the United States army, to do his duty during the war. When he returned to civil life he became an executive of the Charleston Interurban Railroad.

He is one of the exponents of the principle of co-ordinated transportation. He says frankly that the growth and development of the bus has been of great help in getting better results from rail operation.

J. E. Carnes a Headliner

J. E. Carnes, recently appointed to take charge of the bus transportation department of the Cincinnati Street Railway, Cincinnati, Ohio, has been discovered by the Cincinnati *Post*. Of course, to the car riders of that city Mr. Carnes has been known for his geniality for many years, also to the newspapers for the same qualities, but his advancement made of him a public figure. So on its editorial page for April 1 the *Post* played Mr. Carnes up. Alfred Segal was the author of the sketch. He headed it: "Being the Account of One Who Has Succeeded by the Performance of the Day's Work at His Corner." It does not do to adulterate a sketch of this kind. Here is Mr. Segal's account of Mr. Carnes word for word:

Mr. Carnes steps up in the world. Mr. Carnes has made a success. He has not come to sudden riches, and it is probable that he never will be a rich man.

Mr. Carnes has made a success of the day's work.

Jesse Carnes was a street car conductor on the Walnut Hills lines. In his job there are no opportunities for fame or fortune. One must be courteous; one must be conscientious. There is no call for daring enterprise on the back of a street car; no high places from which to shine in the world. One must be considerate; one must be dutiful.

Jesse Carnes made a success of the day's work on the back of the street car, being courteous, considerate and dutiful.

He was promoted to inspector. There are no opportunities for riches or glory in an inspectorship. One works to do the job well. On bitterest days one stands at street corners to direct the traffic. There are tangles to be unraveled and one must not lose his head in the chaos. There are impatient people who demand when, if ever, the next car is coming, and one must know how to answer wrath with a kind word.

Jesse Carnes made a success of the day's work on the street corners, directing the traffic, keeping his head on his shoulders, and answering with gentle words.

In these tasks he continued year after year, doing the day's work as if there were great rewards of riches or glory in it. To do it well he regarded as his success.

At whatever corners he served he made the best of it. When the officials of the railway determined to establish bus lines, they looked about for one to direct them as superintendent. Jesse Carnes did not apply for the place, but the success of the day's work had lifted him up to a high place in the esteem of the officials and he was chosen.

So Mr. Carnes steps up by the success of the day's work.

We are painfully conscious of the fact that there is no thrill in this story of success. The people thrill only to the success of go-getters who walk today and ride in glittering cars tomorrow.

The success of the day's work does not quicken the blood of the people. They'd rather hear of the success of one who has got rich quickly without work.

The appointment of Mr. Carnes was noted in the JOURNAL for March 6.

F. W. Webster Honored

F. W. Webster, well known in California traction circles, has been appointed vice-president and general manager of the Peninsula Railway and the San José Railroad, with headquarters in San Francisco, Cal. The appointment was announced by Paul A. Shoup, executive vice-president of the Southern Pacific Company, which controls these companies. The appointment was made to fill the vacancy created by the death of F. E. Chapin.

For more than ten years Mr. Webster has been the general manager of all the electric lines in the San Joaquin Valley affiliated with the Southern Pacific. His connection with Central California railroading goes back to the days of Harriman's dream of a great

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central state system of electrified lines. He went to Stockton in 1904 to lay out a replacement system of the old narrow gage car line. The new electric line was constructed in 1906. Following this Mr. Webster was transferred to Fresno, to put in a modern electric railway there. Since that time he has been identified with railroading in this section of California. Up to April 10 he was vice-president and general manager of the Stockton Electric Railroad, the Fresno Traction Company, and the Visalia Electric Railroad, and general manager of both the Central California Traction Company and the Minarets Western.

Mr. Webster states that his new appointments will simply supplement the work he is already doing. The situation would mean that his departmental heads would be called upon to do an increased amount of work, as he would no longer be able to visit so frequently all of his offices. For some years Mr. Webster's headquarters have been in Fresno, although he spent most of the time traveling from one to another of the roads under his supervision.

T. J. Brennan Resigns from Dayton Property

Thomas J. Brennan, general manager of the Dayton, Covington & Piqua Traction Company, West Milton, Ohio, has resigned after 22 years service. When eighteen years old Mr. Brennan started as a conductor, remaining in this position two years. When he started to advance his promotions came rapidly. He served in turn as chief dispatcher, head of the line and track departments, assistant superintendent of transportation, purchasing agent and claim agent.

Mr. Brennan has done much to make this one of the popular interurban lines in this section. His efforts in public relation and safety work have done a great deal to keep this line in operation. He has just completed a rehabilitation program providing for track improvements, installation of one automatic substation, seven modern lightweight cars, six freight trailers and two freight motor cars.

T. K. Glenn of Atlanta to Retire

Thomas K. Glenn, long president of the Georgia Railway & Electric Company, Atlanta, Ga., the railway lines of which are operated under lease by the Georgia Railway & Power Company, is to retire from that position to devote more of his time to banking interests.

Mr. Glenn began his railway career in 1891 as secretary to Joel Hurt, then vice-president and general manager of the Atlanta Consolidated Street Railway. In 1902, when the Georgia Railway & Electric Company was organized, he was placed in charge of the claims department and the following year was appointed to the position of vice-president and general manager. This position he resigned in 1908 to become affiliated with the Atlanta Steel Hoop Company, one of the largest manufacturing plants of its kind in the South. In 1913 he was elected third vice-president of the Georgia Railway & Power Company, of which he had also been a director. Several years later he was elected president of the Georgia Railway & Electric Company to succeed the late Frank E. Block. Mr. Glenn is president of the Atlanta & Lowry National Bank. He is one of the foremost figures in financial affairs in Atlanta.

H. D. Bercaw, New Akron Manager, Talks of Franchise

H. D. Bercaw, the newly appointed manager of the southern division of the Northern Ohio Power & Light Company, formerly the Northern Ohio Traction & Light, with offices at Canton, states that the company is working for a new franchise which will give adequate transportation facilities with centralized management. He said he believed that a public utility should be a monopoly and that future developments would lead to that.

Mr. Bercaw, whose appointment as manager was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 9, page 91, was claim agent of the Northern Ohio Power & Light Company at Canton for five years. His transportation duties in Canton might be termed his biggest interest. Since his association with that company he has extended the service by buses in many parts of the city. Though Mr. Bercaw is an Ohioan by birth, he lived a number of years in Indiana. He was born in Darke County, Ohio, but at the age of thirteen moved to Indiana. He attended the Indiana University a year and taught history in the high school at Anderson, Ind., before going to his native state to live. He is a graduate of Otterbein College at Westerville. Mr. Bercaw, associated with traction interests for many years, has full authority in his new position as manager of the Canton and Massillon systems as well as the company's interurban lines south of Akron. In announcing his appointment A. C. Blinn, vice-president and general manager of the entire property, said that the company had felt for some time that the industrial and commercial development of Canton demanded a local resident manager.

H. D. Bercaw

Norman Lee, whose experience in transformer design is international, has recently joined the American Brown Boveri Electric Corporaton at Camden, N. J. After graduating as an electrical engineer from the University of Wisconsin Mr. Lee held several positions with the French Thomson-Houston Company, Paris. Aften ten years with that company he joined the A.E.F. in France. Following the war Mr. Lee designed and manufactured transformers under his own name. In 1923 he returned to this country and joined the Allis-Chalmers Company as a designer of power transformers.

W. H. Vinnedge, who until recently held a position as sales engineer with the Servel Corporation, has joined the railway engineering staff of the American Brown Boveri Electric Corporation. He was graduated from Purdue University.

Jamestown Personnel Reorganized

The adoption of a plan of organization to fix definite control of the property of the Jamestown Street Railway, the Jamestown, Westfield & Northwestern Railroad and the Jamestown Motor Bus Transportation Company, Jamestown, N. Y., was announced recently by George L. Maltby, general manager. Under the new plan Leon H. Johnson becomes general superintendent of the transportation lines; W. H. Pickard, traffic manager; R. A. White, comptroller in charge of finances; F. H. Kiblin, real estate and tax agent; Richard G. Holmes, superintendent of power distribution; Keith L. Conners, superintendent of motive power; Eugene A. Post, superintendent of buildings and bridges; Axel Westergren, superintendent of roadways; C. L. Lammers, superintendent of transportation; A. Raymond, superintendent of buses; Walter J. Cole, storekeeper; E. H. Waterman, assistant to the general superintendent; Ray Miller, car accountant and paymaster.

Obituary

Frank G. Hart, superintendent of transportation of the Bloomington, Ill., division of the Illinois Power & Light Corporation, died April 21. He had been connected with the traction system in Bloomington more than 30 years and for nearly four years was superintendent of the transportation division.

Ray W. Reynolds, at one time superintendent of the Terre Haute, Indianapolis & Eastern Traction Company, at Lebanon, Ind., and later a superintendent at South Bend, Ind., died at his home in South Bend recently. He was a graduate of Purdue University and of Armour Institute of Chicago. He was 43 years old.

William Keller, day depot master at East New York station of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died recently. Mr. Keller began his railroad career in 1898 as a conductor with the old Nassau Railroad at the Ninth Avenue depot, but was two years out of service before being appointed at East New York depot in 1908. He was appointed night depot master on Aug. 6, 1914, and in June, 1916, was appointed to the position he held at the time of his death.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Grand Rapids Cars Are Soon to Be Delivered

Construction of the 27 new de luxe type street cars for the Grand Rapids Railway, Grand Rapids, Mich., is nearing completion and it is expected that delivery will be begun shortly. The cars when delivered will be equipped with spring bumpers of the auto type at each end. They will have two headlights at the front end in shapely reflectors attached to the front dasher. A tail-light and spotlight are provided at the rear end of the cars. The unit as shipped will be equipped with de luxe highly upholstered individual bucket type seats. The car bodies will be mounted on St. Louis Car Company E.I.B. type trucks, the standard equalized easy-riding graduated spring truck of that company. As an added feature the side frame equalizer will be adaptable to receive either a friction bearing box or a roller bearing box.

Twenty-three of the cars will be equipped with friction bearing boxes and four will be equipped with roller bearing boxes, two each of the Hyatt and S K F types. At any future time, at the pleasure of the railway, the friction bearing boxes may be removed and roller bearing boxes installed without any alterations in the truck frame. This particular truck was developed along these lines, especially for the Grand Rapids Railway, and it is the first installation of its kind.

The new cars will be provided with the same type of light shield, equipped with high-powered lamps to illuminate the front dash, as appeared on the "St. Louis" sample car built by the St. Louis company some time ago. The principal specifications of the Grand Rapids cars were published in the issue of ELECTRIC RAILWAY JOURNAL for Dec. 5, 1925.

Graybar Organization Changes

A reorganization of the sales department, involving the reallocation of the managing personnel and the creation of several new activities, to take effect immediately, has been announced by G. E. Cullinan, vice-president in charge of sales of the Graybar Electric Company.

The reorganization, together with the staff designation of the personnel, is as follows: M. A. Curran, assistant to vice-president, formerly manager of the central station department; J. L. Ray, general supply sales manager, formerly manager of supply and equipment department; E. A. Hawkins, general telephone and appliance sales manager; G. F. Hessler, general utilities sales manager, formerly manager line material sales department; G. K. Heyer, assistant general supply sales manager, formerly telephone sales manager; A. J. Eaves, public address and carrier current sales manager; P. M. Rainey, telephone sales manager, formerly sales development manager; G. E. Chase, broadcasting sales manager, formerly broadcasting sales engineer; O. E. Richardson, broadcasting sales engineer; J. W. Skinkle, signaling sales manager; A. E. Hetzner, signaling sales engineer; and A. S. Wise, appliance sales engineer.

The above changes in staff personnel are the culmination of a reorganization of the Graybar general sales organization which has been in course of development for some time.

Rehabilitation Program in West Milton

An improvement program for West Milton, Ohio, was recently completed by T. J. Brennan, general manager of the Dayton, Covington & Piqua Traction Company. He recommends the acquisition of seven modern, lightweight cars, six freight trailers and two freight motor cars. Rebuilding of tracks and the installation of one automatic substation are included in his program.

Chicago Will Have 100 New Cars

The Chicago Surface Lines has been authorized to purchase 100 new street cars. These are expected practically to duplicate a similar group of 100 cars which were ordered in the spring of 1924 and placed in service the same year. Bids have been requested on the units, which are to be double-truck, double-motor cars adapted for multiple-unit operation. Complete data on the cars purchased in 1924 were published in the issue of ELECTRIC RAILWAY JOURNAL for Nov. 15, 1924. That the present order for 100 cars is to be placed in the last year of the Surface Lines' franchise is evidence of the confidence which the officers of the company have in the satisfactory outcome of the complex local situation and in the future of the electric railway industry.

Metal, Coal and Material Prices

Metals—New York	April 27, 1926
Copper, electrolytic, cents per lb	14.037
Copper wire, cents per lb	16.00
Lead, cents per lb	7.875
Zinc, cents per lb	7.22
Tin, Straits, cents per lb	63.75
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.125
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.50
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.04
White lead in oil (100-lb. keg), N. Y., cents per lb	15.50
Turpentine (bbl. lots), N. Y., per gal	$0.90

W. E. Kelly Now with Hegeman-Castle

W. E. Kelly has been appointed general manager of the Hegeman-Castle Corporation, with headquarters in the Railway Exchange Building, Chicago, Ill., replacing H. T. Heath, who has resigned. Mr. Kelly entered the service of the Ilinois Central Railroad in 1898, serving in various capacities in the store, mechanical and purchasing departments and leaving in 1907 to engage in the railway supply business as manager of the Chicago territory for the Elkhart Rubber Works.

In 1911 he accepted service with the Patton Paint Company as railroad sales representative in Chicago and the Western territory and was appointed manager of railway sales in 1916, resigning in 1918 to go with the Central Railway Signal Company, Boston, Mass., as Western representative. He will still continue to represent the Central Railway Signal Company in addition to his new duties as general manager of the Hegeman-Castle Corporation.

Storage Battery Business Is Good

Activity in the storage battery field so far in 1926 has been on a par with the corresponding trade in 1925, at least in the experience of the Electric Storage Battery Company, Camden, N. J., one of the largest manufacturers of batteries in the United States. Incidentally, the 1925 period was exceptionally good, so that the previous statement has considerable significance. Herbert Lloyd, president of the company, stated at the annual meeting of stockholders that indications for the remainder of 1926 are very good and that there has been no let-up in the volume of new business thus far in the year.

Chicago Gets Substation from Westinghouse

The Westinghouse Electric & Manufacturing Company has recently received an order from the Chicago Surface Lines for a 4,000-kw., 600-volt direct-current automatically controlled substation to be located on Grimm Avenue, Chicago, Ill. The order calls for two 2,000-kw., 60-cycle, 600-volt synchronous converters with six 667-kva. OISC, single-phase, outdoor transformers, stepping down from 2,000 volts high tension to converter voltage. Automatic switching equipment for the control of these two units and a set of supervisory control equipment are also included in this contract.

The automatic switching equipment will provide full protection for unattended operation of two 12,000-volt, three-phase incoming lines, two 2,000-kw. synchronous converters and seven 600-volt d.c. feeders. Four electrically operated high-tension oil circuit breakers will be provided and arranged so that by means of a high-tension bus either or both converters may be sup-

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plied from either or both incoming lines.

The total output of the station will be supplied to the present direct-current network through seven 2,000-amp., short-circuit detector, automatic service-restoring feeders.

Supervisory control of the synchronous visual type will permit the dispatcher located in the Crawford Avenue station to supervise and control the operation of this Grimm Avenue station.

Electrical Business in Germany Shows Upward Trend

German electrical equipment manufacturers enjoyed a prosperous export year in 1925, according to recently published statistics. The market price for stocks of electrical equipment companies showed this German industry to be one of the most prosperous of the country. In fact, as a whole it ranked third only behind banking and brewing in maintaining a high level of stock quotations.

Domestic business was fairly good considering general economic conditions. Foreign business was satisfactory even in comparison with previous inflation years, and some of the larger companies were in such an advantageous position that they were able to secure large foreign loans. Prices both at home and abroad were maintained in all lines. Several large foreign contracts for complete power plants were obtained.

Railway electrification was extended to additional lines in various parts of the country. The electrical development of Germany utilizing both lignite deposits and water power spread rapidly during 1925 and is continuing, acording to Trade Commissioner Theodore Pilger of Berlin.

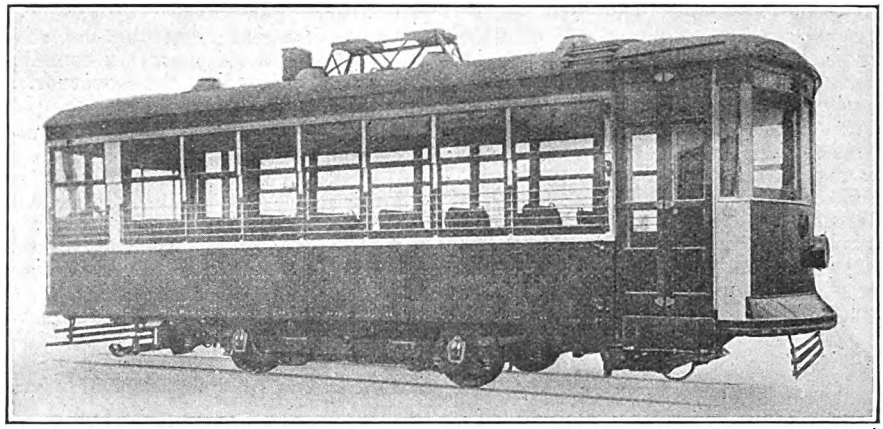
R. F. Fiske Heads Sales for Nuttall

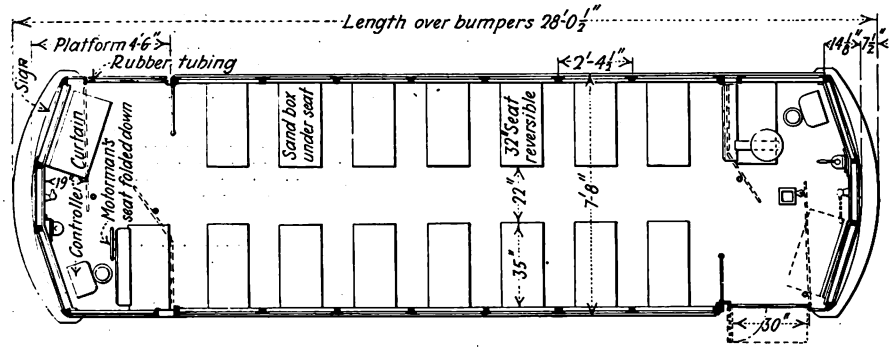
R. F. Fiske, for several years manager of the R. D. Nuttall Company, Philadelphia office, has been appointed sales manager, with headquarters at Pittsburgh. He takes the place of Q. W. Hershey, resigned. John E. Mullen has been appointed assistant sales manager.

Mr. Fiske is a New Englander, receiving his early education in the public schools of Massachusetts and his technical education at Harvard. After graduation he was with General Electric Company at the Lynn and Pittsfield plants. He moved to Pittsburgh in 1908 to join the sales force of the Union Electric Company, Nuttall agents. In 1917 he became a member of the Nuttall sales force, and in 1919 was made manager of its Eastern sales activities. His recent appointment is a well-earned recognition of his ability to direct both sales policies and men for the company.

Mr. Mullen entered the employ of the Nuttall company in the capacity of a junior clerk. He has held many important positions with this concern, and is classed as one of the old-timers in point of service, with a thorough knowledge of the company's policies and products.

Delivery of Cars to Fort Smith Is Made





Shipment has been made of six single-truck, double-end Birney safety cars constructed by the American Car Company, St. Louis, Mo., for the Fort Smith Light & Traction Company, Fort Smith, Ark. The cars, whose bodies weigh 6,500 lb., will have a seating capacity of 32. The principal specifications on these new units are appended here:

Length over all	28 ft., ½ in.
Truck wheelbase	8 ft.
Width over all	8 ft.
Height, rail to trolley base	9 ft., 10⅛ in.
Body	All steel
Interior trim	Mahogany
Roof	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Bronze
Compressors	Westinghouse DH-16
Control	K-63
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote, K-2-86
Destination signs	Hunter illuminated
Door-operating mechanism	American Car Company
Fare boxes	Johnson, DM-3
Wheelguards	American Car Company
Gears and pinions	General Electric
Hand brakes	American Car Company with drop brake handle
Heater equipment	Consolidated
Headlights	Crouse-Hinds "Golden Ray"
Journal bearings	Friction type
Journal boxes	Brill
Lightning arresters	General Electric
Motors	Two GE-264, inside hung
Finish	Pratt & Lambert, vitralite railway enamel
Registers	Sterling
Sanders	American Car Company
Sash fixtures	O. M. Edwards
Seats	Brill "Waylo" type
Seating material	No. 203, green plush
Slack adjuster	Brill
Springs	Brill
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	Kalamazoo with bayonet harps
Trucks	Brill special No. 79-E
Ventilators	Brill exhaust type
Wheels	Rolled steel, 26 in.

Use of Balloon Tires on Buses Increasing

That low-pressure, or balloon, tires are coming into use on buses and motor trucks at a much faster rate than is generally realized was indicated by J. M. Linforth of the Goodyear Tire & Rubber Company at a meeting of the Cleveland section of the Society of Automotive Engineers. He stated that since 1923 his company had put on approximately 300 of this type of tire for buses and had been watching their performance closely. Seven sizes are now in regular factory production, and of these Goodyear believes that the 36x8.25 size will be the most popular, as it has been found most suitable for the average 29-passenger bus. The 34x7.50 size will be used on vehicles of smaller capacity. Mr. Linforth went on to say:

Our experience seems to indicate that at least as much mileage should be obtained from the balloon tires as from high pressure tires; tests have shown actually greater mileage. We are convinced from actual results that they should not puncture more easily or frequently than high pressure tires.

One of the important advantages derived by the use of balloon tires is the decrease in running time of the vehicle due to an increase of the minimum speed without any increase of maximum speed. We have found that the motorcoach balloon tires hold the road on wet as well as dry surfaces much better than high pressure tires. Many operators have remarked that they are able to make stops with balloon tires that would be impossible with high pressure tires. Thus the balloon tires add to the safety of motor coach operation.

Yellow Buses Will Be Among General Motors Exhibits

Included in the permanent exhibit which the General Motors Corporation will open on the Steel Pier, Atlantic

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City, during July will be the products of the Yellow Truck & Coach Manufacturing Company. This will be the first permanent exhibit at which all of the products of General Motors will be displayed under one roof and will occupy 22,000 sq.ft. of floor space. In addition to Yellow Truck & Coach products, the exhibit will embody the six lines of General Motors passenger cars, GMC trucks, Fisher body products and all of the various General Motors parts and accessories manufacturing companies. At night the exhibit building will be illuminated by an animated sign 65 ft. in length and a fixed electric sign 290 ft. long, one of the largest signs of its kind in the world.

A. E. Allen Now Vice-President of Lamp Works

Arthur E. Allen was elected a vice-president and a member of the board of directors of the Westinghouse Lamp Company, New York, N. Y., at a meeting of the board of directors held April 7. Mr. Allen will replace T. G. Whaling, who died recently. Prior to taking over his new duties, Mr. Allen was general manager of the Westinghouse Lamp Company. He has long been affiliated with the Westinghouse Electric & Manufacturing Company, having entered the employ of that concern at the Newark works in 1902, subsequently being placed in charge of the test department. Later he became manager of the supply department of the New York sales offices, then executive assistant of the manager and then manager of the New York district sales office. In April, 1925, he was made general manager of the lamp company.

Rolling Stock

Altoona & Logan Valley Electric Railway, Altoona, Pa., has purchased five buses from the Yellow Truck & Coach Company, Chicago, Ill.

Key System Transit Company, Oakland, Cal., has placed an order with the Differential Steel Car Company of Findlay, Ohio, for ten Differential cars. Six of these will be motored and four trailers.

Boston Elevated Railway, Boston, Mass., has added five city type Mack buses to its large bus fleet. The new equipment will operate at a 6-cent fare on the 2-mile Brooks Street route.

Miami Beach Railway, Miami, Fla., has just received four six-cylinder gas-electric buses from the Fageol company, Kent, Ohio. Electrical equipment for these units was supplied by the General Electric Company.

Boston Elevated Railway, Boston, Mass., has recently purchased six Differential Cars from the Differential Steel Car Company of Findlay, Ohio. These cars will all be motor cars and will be equipped with Westinghouse HL control.

Interborough Rapid Transit Company, New York, N. Y., has been ordered by the New York Transit Commission to buy 382 new cars, costing about $10,000,000. This is part of a general order looking toward an increase in the facilities of the company. In defraying the cost of this program the city will participate under the dual rapid transit contracts. The company expects to appeal from the order to the members of the incoming commission, just appointed by the Governor.

Boston Elevated Railway, Boston, Mass., has ordered 100 new cars for use in main line elevated service. Of this total, 75 will be built by the Wason Manufacturing Company, Springfield, Mass., and 25 by the Laconia Car Company, Laconia, N. H. Delivery of the units will be made at a rate of two per week beginning Nov. 26, 1926. Many of the details of the new units have yet to be decided upon and orders for much of the equipment remain to be placed. Some of the principal specifications are available, however, and are given here:

Seating capacity	44
Bolster centers, length	32 ft., 3½ in.
Length over all	46 ft., 7½ in.
Truck wheelbase	6 ft., 0 in.
Width over all	8 ft. 7½ in.
Height, rail to top	12 ft. 9 5/16 in.
Body	All steel
Interior trim	Steel
Headlining	Agasote
Roof	Combination
Couplers	Tomlinson
Curtains	None
Destination signs	Electric Service Supplies
Energy-saving device	Rico coasting clocks
Journal bearings	Plain
Journal boxes	Cast steel
Motors, Two Westinghouse 301, inside hung	
Trucks	motor, Baldwin; trailer, Taylor
Wheels	34 in. and 31 in.

Aurora, Elgin & Fox River Electric Company, Aurora, Ill., has just ordered eight safety cars from the St. Louis Car Company, St. Louis, Mo. One Fageol bus, equipped with Westinghouse air brakes, was also purchased.

Twin City Rapid Transit Company, Minneapolis, Minn., is now building a new type of two-car train for use in St. Paul and Minneapolis. If the experimental service of the first train is satisfactory, this type will be the basis for future replacements and expansions of equipment in the Twin Cities.

Track and Line

Madison Railways, Madison, Wis., will rebuild all of its tracks around Capitol Square on Mifflin Street, Carroll, West Main and Pickney Streets. The tracks will be raised and a new concrete base will be laid preparatory to the city repaving these streets.

Des Moines City Railway, Des Moines, Iowa, plans to lay new track within the coming twelve months at a cost of between $30,000 and $40,000. The extension will be more than 1 mile long. A ten-year fight has been waged over the location of the extension.

Power Houses, Shops and Buildings

Louisville, Ky.—Work is to start this spring, it is understood, on the proposed new consolidated interurban station to be used by the Louisville & Interurban Railroad, a suburban division of the Louisville Railway, and also the Interstate Public Service Company, operating the lines between Louisville and Indianapolis. The new station will cost about $500,000. When the new building is completed the two present interurban stations will be abandoned. The new quarters will house all offices and operating departments. Land for the new station was bought two or three years ago, but building has been held up on account of financial conditions.

Public Service Railway, Newark, N. J., through its bus subsidiary, the Public Service Transportation Company, is erecting a garage at Turnerville, N. J., to house the buses that operate in South Jersey. The garage will front 300 ft. along the Black Horse Pike.

Trade Notes

Watson-Stillman Company announces that on and after May 1, 1926, its main offices and sales department will be located in the Evening Post Building, 75 West Street, New York, N. Y.

Gould Car Lighting Corporation, Baltimore, Md., has filed a certificate in the office of the Secretary of State to allow it to do business in New York State. It is capitalized with 10,000 shares of no par value. Its New York office is located at 250 Park Avenue.

Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio, announces that new shades of Kemi-suede have been produced and are now ready for the market. Blue, green, maroon, black and nut brown have been added to the line, along with dark fawn, light fawn, blue gray, mixed gray, buckskin and neutral gray. Among the railways which have specified Kemi-suede are those in Cleveland, Milwaukee and Grand Rapids.

National Railroad Trolley Guard Company, Olean, N. Y., has disposed of all of its stock and rights to the Ohio Brass Company, Mansfield, Ohio, and notice of the dissolution of the corporation has been filed with the Secretary of State. For some years prior to taking over the assets of the National Railroad Trolley Guard Company the Ohio Brass Company was the exclusive sales agent for the former concern.

New Advertising Literature

J. Rowland Bibbins, consulting engineer, Washington, D. C., has issued a leaflet giving two essential transit-traffic determinations, namely, renewal liability and the traffic-thoroughfare plan. Also, representative surveys of Philadelphia and Indianapolis are briefly sketched, and a number of factors in proper budget determinations are given.

Allen-Bradley Company, Milwaukee, Wis., has issued a leaflet illustrating its motor starters for all types of alternating-current motors.

Crouse-Hinds Company, Syracuse, N. Y., has issued a folder describing various types of condulets for grounding service wires and conduit systems. As stated in the folder, the importance of a well-grounded system with ground wires thoroughly protected from mechanical injury has been gaining rapid recognition and is now a requirement of the 1925 code of the National Board of Fire Underwriters. Type GC condulets are listed in addition to No. 2089.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

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Traffic Police Officers Discuss Street Congestion

ONE whole session of the railway sectional meeting of the Southwestern Public Service Association at Galveston was devoted to traffic problems—not by operators, but by policemen. Lieutenants and captains of traffic squads from a half dozen cities of the Southwest told of traffic problems in their own localities. The railway executives listened.

This is the first time that such a representative group of traffic officers has been gathered together at a railway convention. The results were interesting in that the unanimous opinion of these speakers was that the parked automobile constitutes the greatest nuisance.

It was the unanimous consensus of opinion that officers of the traffic police be invited and welcomed into all meetings of this kind. W. W. Holden, chairman of the railway section, is to be congratulated in getting together such a group. Now if the industry can get together a representative group of merchants and show them the facts—how the arteries leading to their places of business are being clogged—perhaps some drastic action will be possible.

Terms of Cleveland Franchise Made More Liberal

CLEVELAND has modified its Tayler service-at-cost grant. These modifications are very important. They cover practically all the suggestions contained in the report of the Greater Cleveland transportation committee, but they do not include the suggestion of President Stanley of the Cleveland Railway for an increase in the dividend rate from 6 per cent to 7 per cent. That, however, is not regarded as an insuperable barrier considering the other changes that have been made. Maximum fares are made 10 cents instead of 6 cents, and the fare barometer is made $500,000 as a minimum and $1,000,000 as a maximum. The new fare base is particularly significant in that Cleveland started with a 3-cent rate. The removal of the barrier imposed by the former 6-cent maximum fare indicates the growing appreciation of the need for street railway rates that will permit improvement and extension of service. Thus the working out of the original service-at-cost plan in Cleveland is beginning to establish the proper cost of local transportation.

These and other phases of the matter, notably the occasion for the modification of the plan, were the subject of articles in the JOURNAL for April 3 and May 1. Present interest, however, is more in the probable effect of the changes than in a detailed consideration of them. Briefly, it is expected that the changes will permit the company to push car lines and bus feeders into new, developing territories and enable it to better the service on existing lines. To carry out these plans it is estimated that between $3,000,000 and $5,000,000 will be needed. That is very significant.

Basically the ideas behind the Cleveland grant are sound. That fact led more than a dozen other cities to adopt similar grants, but only in a few cases have these grants stood the test of time, and in at least one of them the case has been hopelessly muddled, principally because of the stupidity of the local governing body. Reference is made to the failure of some of these modified grants to work successfully only to emphasize how difficult is the general adoption of any such plan. That, however, is a subject in itself. Perhaps the most persistent criticism of grants of this kind was the so-called "lack of incentive to economical operation" based on the idea that all economies work to the benefit of the car riders rather than the stockholders. The committee made a special effort to develop information that would prove or disprove this criticism. Evidence was lacking to justify the contention. As the Greater Cleveland Transportation Committee and as economists see it the Tayler grant probably represents the most important step that has ever been taken toward reconciling the demands for adequate transportation service with a natural desire for profits for those who undertake to furnish such service. The two things are difficult to reconcile, but they are not necessarily incompatible.

Appreciation of the Annual Report as Public Relations Material

REPORTS of financial operation for the year 1925 now being received indicate the growth in appreciation of the value of the annual statement as a means toward bettering public relations. Accountants and others might be inclined to say that many of these statements are not all that they purport to be. Certainly some of them leave much to be desired, particularly those of the holding companies in which statements are grouped. But much of the mystery about the items that go to make up these statements is being removed by the tone which such reports as those of the Chicago Rapid Transit Company, the Illinois Power & Light Corporation and the Virginia Electric & Power Company, to mention just a few, have assumed.

Particularly noticeable is the change in form and contents of the Virginia statement. This year's report is not only different in size from the ones rendered in recent years but the method of treatment has been altered radically. True, some of the tables of operating statistics available in previous years are missing, but each of the items in the statement of earnings, the balance sheet and the recapitulation of funded debt is made readily understandable. This does not detract from the value of the report to the man accustomed to reading these documents, but the man in the street no longer has to resort to legerdemain to find out what the figures are all about.

Wider distribution of securities among the public is undoubtedly accountable for this decided change in the aspect of many of these formerly formidable documents,

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but whatever the reason, the change is certainly a good one from the standpoint of better public relations. Both the Chicago report and the Illinois report are elegantly illustrated as well as clear and informative. Elegance is a matter of taste. There are certain things, however, which the accountant or the engineer expects to find in every report. He is entitled to be informed within reason. This does not mean that any of the things highly desirable to be there have been omitted from any of the reports which have been mentioned. It merely means that after all an annual report, just like a person, should not become ornate at the possible sacrifice of substance.

Public Utilities Better Understood in Dallas

IT IS with a sense of gratification that the industry reads of the solution of the Dallas franchise situation. The Dallas Railway is allowed to charge a 7-cent fare with a 6-cent token rate. There are two important features involved. The increased fare will of course allow a much-needed increase in revenue, but of greater importance is the fact that the company has been successful in inducing the public of that city to appreciate the value of its local transportation system.

This has not been clear sailing, but is a result of continued effort on the part of the management extending over several years in the rendering of a high-grade service. Since Dallas has continued to grow rapidly for several years, this has not been an easy accomplishment. City growth means new investment for new cars and line extensions, and new money does not flow in channels blocked by strangling limitations of earning capacity.

Texas does not have state public utility regulation, hence the burden falls on the local communities to regulate their own utilities. Often misunderstanding and injustice arise from such conditions because of the relatively less experience of local bodies in handling such matters. The advantages accruing from this decision will be mutual. The city will receive the needed extensions and the company will be in position to finance the necessary funds in a satisfactory manner.

So there is reason for congratulation when a company can successfully come to so satisfactory an agreement as that just reached in Dallas.

Transportation Men Can Help in Solving Street Traffic Problem

COMING into a city of medium size some time ago, one of the passengers on an interurban car had occasion to catch a railroad train with but a limited time to spare. Naturally he asked the interurban conductor if he would be able to make the connection. Imagine his surprise when the conductor advised confidentially that if he wanted to be sure of getting to the station in time to catch his train, he should get off and walk, as that was much the quicker. The conductor's answer seemed all the more surprising because there was no unusual traffic block, but only the normal slow movement on the city thoroughfare.

Sadly enough, the condition illustrated by this experience is not unique. To a great extent it may be duplicated in nearly any large city. It is not confined to the street cars nor to street-car streets. Frequently the best conditions for vehicle operation will be found on streets where car lines operate. In New York, for example, it is well known by experienced vehicle drivers that the best running time, whether in buses or automobiles, may be made on those streets with car lines. Of course, the running time even on those streets is still much slower than is desirable if the traffic of the city is not to be choked.

Herein lies one of the greatest problems confronting the transportation man. The automobile and the truck are here to stay. Let there be no doubt about that. The best thing, then, is to regulate their movements—and even more important, the conditions under which they stand still—so that they will not interfere with common-carrier vehicles. The time is rapidly approaching when parking must be restricted sharply, if not eliminated entirely. Loading of trucks in such manner as to block the thoroughfares must also be prohibited.

In all of this development the transportation operator can play a leading part. He can show the public the need for proper traffic regulation. He can demonstrate that the loss to the community is due to catering to the few who cause the most of the trouble. He can do a large share in molding public opinion so that it will be seen that regulation will help the community more than it helps the transportation company, and that in the end it will mean lower fares and better service if it is made possible to move traffic with dispatch.

Success of Bus and Car Depends on Fitting Them Together

IT IS becoming more evident daily that responsible bus manufacturers who have studied the situation carefully do not advocate the wholesale replacement of electric railway lines with buses. Setting aside all considerations of carrying capacity or street congestion, students of the subject are agreed that such replacement would be a bad thing for the development of the bus itself. Should the new vehicle become burdened with the responsibility of rendering mass transportation service at minimum rates, the possibilities for applying it in the various forms of preferential service for which it is inherently so well adapted would be seriously limited.

But upon railway men lies the responsibility for finding the place of the bus and developing such service in proper relation to rail lines. An important step in this procedure involves developing the railway itself to a modern standard of performance and service. Once the street car is brought up to a state of development that exhausts its possibilities, then the place of the bus will become increasingly clear. Until that is done, there is danger of putting the bus into service for which the car is better adapted, while at the same time possibilities for the bus that offer opportunities for profitable operation will be overlooked.

Replacement of obsolete car equipment with rolling stock that fits modern public demand is an important step in giving the railway a new standing before the public. Notable progress is being made in several instances, but there is room for much more. Results accomplished by many properties that have replaced obsolete cars with modern equipment show that such action is not only desirable but profitable. New cars literally pay for themselves in reduced operating cost and increased riding. The public judges the entire standing of the railway by the appearance of its cars.

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When old, dilapidated and awkward-looking equipment is continued in service, the public welcomes the advent of new, shiny-looking buses, even when such service is not justified by the needs of the community. When a railway is stampeded into hasty substitution of buses for cars, the bus as well as the railway suffers in the long run.

There is no stronger argument for relief from franchise burdens and paving costs than a group of spick-and-span new cars. Even a few sample cars to show the public what may be expected under improved conditions has in several notable instances brought enthusiastic co-operation from the public. Relief from paving charges would go a long way toward paying the cost of new cars on many properties.

The future of the local transportation industry depends on fitting the two vehicles together in such a way as to get the best results from each. To enter bus operation in a half-hearted manner under the pressure of public demand is fatal to success. To substitute the bus for a run-down railway property in the hope only of making a losing proposition less costly, is after all only a temporary expedient. The ultimate success of the industry depends on using both vehicles under conditions that will permit each to stand on its own feet financially.

When Club and Courtesy Coalesce

"CLUBBING WITH COURTESY," a philosophy advocated recently by a police chief before a somewhat startled audience, is not a contradiction in terms. Railway men certainly would not have been astounded by it. To them this qualification of courtesy is as essential as cleanliness and efficiency, and very often eclipses the other two in importance. From the time the apprentice becomes part of a railway personnel, up through the various stages of his career, he has heard the doctrine of civility preached persistently and consistently to every man in the organization; he has often been an eyewitness to the good results of a "soft answer turneth away wrath" and occasionally a beneficiary in dollars and cents of his own acceptance of this cabala. To club with courtesy is somewhat difficult, but not so difficult as courteously and almost simultaneously to collect fares, issue transfers, answer foolish questions, aid an elderly lady off the car and a crippled customer on, announce the stops, ask the seemingly stubborn crowd to "move up, please," pacify the irascible and smile all the time. It would appear that the conductor returns clubbing with courtesy.

One wonders if he doesn't now and then give vent to his discouragement when he sees that the desire to please isn't so contagious as the good book would have him believe. However, for the many times he thinks his courteous consideration has passed unnoticed there is always the one outstanding incident when he sees in the agitated passenger an excess of sanity over shrewishness, and it is to such an employee's credit that the beginning of a new friendship is directly ascribable.

No railway property is operating today without its ideals of civility as well as those of service and safety, and no new year is greeted by a utility management without the hope that "it can be made a banner one for civility." With this purpose in view it broadcasts courtesy from its house organs and its cars, encourages essays on "the most courteous act," and offers extra rewards for the 100-per-center in politeness.

Beneath the surface of this commander's "clubbing with courtesy" idea lies a thought of more intrinsic value than subsequent humorous comments would lead us to believe. "Club" and "courtesy" are not diametrically opposed. Clubbing is merely an extreme case of chastement or coercion, which has always synchronized with courtesy when deft handling was coupled with a worthy intention. "Clubbing with courtesy" is not incongruous. It only seems so. Somehow, this politeness paradox must be recognized.

No Parking in This Block

"MAIN STREET" of the average so-called single-industry town forms a "bottleneck" which can boast of rush-hour traffic congestion approaching metropolitan city conditions. Tourist travel helps to aggravate the difficulty. This precious stretch of highway was due for a repaving in a certain city, and the people painfully looked forward to "when Main Street gets torn up." But their troubles never happened. When the railway began its work it relaid both tracks and paved its part of the street without hindering its service. But that wasn't all. A sign was placed at each end of the block bidding automobiles not to park. Then a surprising thing was discovered. The railway tracks were necessarily exclusively available to the street cars, and the rest of the street was kept open for the traffic that wanted to move. Night-time conditions lasted all day long. The efficiency of this block hadn't been so high in years.

There was a demonstration here of the effect of a day-after-day line of parked automobiles in reducing the capacity—no, the output—of a city street. In addition to the paving burden carried by many properties there has come the parking evil; one cutting down net earnings, the other keeping down gross revenue. Both crept into existence as a sort of by-product of changing conditions.

Automobile parking as a hindrance to the improvement of necessary car schedules has become a condition that limits the performance of the average city railway. The industry is beginning to take up the subject seriously, as evidenced by the prominent place given to it on a recent convention program. Several companies now provide "uptown" parking areas to reduce travel by automobile in the congested districts, thus literally co-ordinating the private automobile with their railway service. This is real progress. That electric railways may capitalize even the "ugliness of parked automobiles in city streets" has also been suggested. Merchants are finding by actual investigations that the number of their buying customers is not dependent on the number of automobiles parked near by; that their store business is not necessarily in proportion to their street congestion. This is encouraging.

Will Rogers has aptly visualized the parking problem of the automobile owner in a word picture of the business man who, after looking a couple of hours for a place to park and having found one, walked past his own home on his way downtown. This "philosopher in cap and bells" can find food for thought in the paradox of parking idle automobiles on the most used space in a city space that is dedicated to the public good and set apart for the business of transportation. So can electric railway operators. So can city officials.

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Atlanta Successfully Solving Its Local Transportation Problems

The Company's Contribution Is Improved Service Through Modern Cars and Buses—The City Eliminated Jitneys and Has Approved Request for Fewer Stops—By This Co-operation Atlanta Is Entering a New Transportation Era

ELECTRIC railway history has been made in Atlanta during the last five years. By a combination of circumstances it has been a city where solutions had to be found for a number of serious local transportation problems. The situation was met in a courageous spirit and with the firm belief that there could be no successful substitute for the electric railway system; hence that its preservation and improvement were as important to the city as to the owners of the property.

Final results are not yet available because the program of rehabilitation is still under way. However, enough has been accomplished to show that while the railway in Atlanta is not yet on an entirely self-supporting basis, it is serving the public of that city far more efficaciously and efficiently than it has for many years. Particularly gratifying have been the results obtained by the change from old to modern cars. Atlanta will always be handicapped to some extent in its transportation by its irregular topography and the narrowness of many of the principal downtown streets, but great advances have been made toward better local service during the past two years, and others are under way.

Atlanta Also Has a Flatiron Building. It Is at the Corner of Broad and Peachtree Streets

The improvements outlined were initiated none too soon for the needs of the city. Atlanta is growing rapidly and next to New Orleans is the largest city in the states which lie south of the southern boundaries of Virginia, Kentucky and Missouri. The population of Atlanta in 1910 was 154,836, and in 1920 it was 200,616. Within the 7-mile zone the population in 1920 was 228,762.

As with other large cities in this country, the electric railway system in Atlanta suffered from the high cost of labor and materials during the war. The financial results in 1920 and 1921 were fairly good, but earnings began to fall off in 1922 until the net in 1924 was less than 77 per cent of that in 1921. All through this period the railway company was alive to the difficulties it was facing, and tried whatever means it could to help the situation. A fare change from 5 cents to 6 cents in April, 1919, and from 6 cents to 7 cents in October, 1920, failed to give relief. The company decided that to begin litigation for a fare high enough to pay an equitable return would injure its public relations and do more damage than good. Instead, it decided upon a course of informing the public of what was causing the financial difficulty, hoping in this way to reach a more desirable solution.

Negotiations with City

Among the first steps in this program of informing the public was a petition presented by the company and filed with the Mayor and General Council of the city on May 11, 1923. In this petition the company specifically stated that it attributed its poor financial condition to the fact that automobiles had taken part of the natural growth of the street railway business, that unregulated jitney competition had been making a heavy inroad on the company's revenue, and that intolerable conditions and poor methods of controlling street traffic and unlimited parking were causing the railway considerable expense because of the delays in operating cars. In addition to these handicaps the greatly increased cost of materials and labor caused operating expenses to rise from a fraction over 50 per cent of the gross revenue in 1909 to 72 per cent of the gross revenue in 1922.

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At that time the company stated there was a great need for improvement to the street railway system; new track and new cars were required, and the addition of a high-class bus transportation system would be necessary to supplement the street railway. But the company declared it would be unable to effect these improvements which were necessary to keep pace with the city's growth unless it had a reasonable opportunity to earn a fair return.

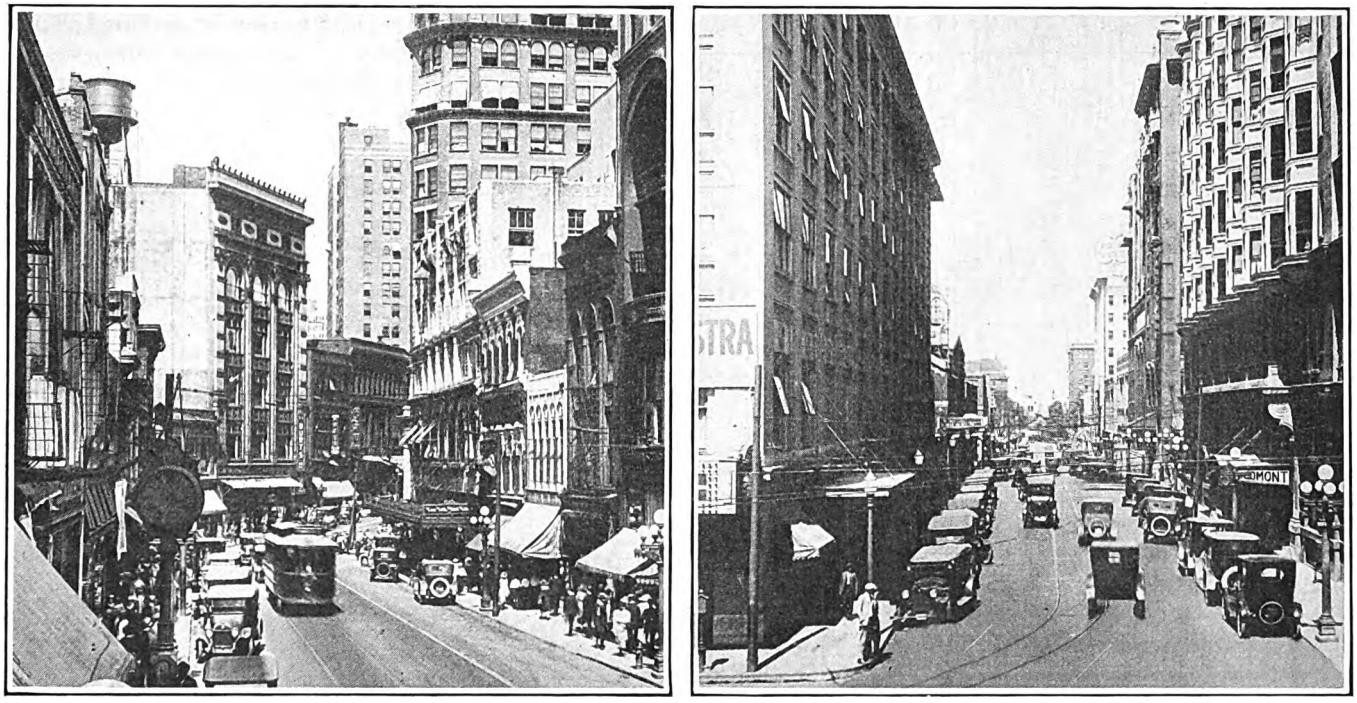
This petition was followed by another one on Dec. 1, 1923, when the company suggested the definite remedies which are outlined below:

1. Complete elimination of jitneys from streets upon which street cars are operated.
2. Renewed and effective enforcement of regulation of street traffic.
3. A 10-cent cash fare on street cars; tickets to be sold at the existing rate of 6⅔ cents. In other words, car riders who bought tickets would pay no increase in fare.
4. A 2-cent charge for transfers.
5. Reasonable revision in the operating routes of the cars in the interest of more efficient operation.
6. Elimination of unnecessary car stops to effect quicker street railway service.
7. Relief to the extent necessary from paving charges and gross receipts taxes.

This petition also said that "the above changes, only to the extent necessary, are asked for the purpose of putting and keeping the street railroad on a living basis in the interest of the public and as a simple act of justice to the owners who built and paid for the system."

This petition was followed by a series of public meetings in which representative citizens expressed their views and offered definite suggestions for a means of settling this difficulty. It was finally decided that the most satisfactory solution would be to have an impartial investigation made of the entire local transportation situation by disinterested, outside experts of national reputation. The company agreed to pay the expense of such a survey of the city. The city of Atlanta, through its special traction committee, selected the Beeler Organization of New York for this work. This organization began work in the latter part of February, 1924, and submitted its report to the City Council on Dec. 16 of the same year. Abstracts of this report were published in the issues of this paper for Jan. 10, Jan. 24, and Jan. 31, 1925.

This report was accepted by both city and company as a basis for the important changes which have followed. The example thus set of teamwork in behalf of better transportation conditions and service is a notable one. Specifically, the greater part of the recommendations in this report have been carried out, or will be shortly. Thus, part of the rerouting proposed has to await the construction by the city of certain new viaducts. Authority for wider spacing of car stops to an average of about six per mile in the outskirts of the city and eight in the central district has been approved by the City Council, but must still receive the sanction of the Public Service Commission. The Mayor of Atlanta has recently appointed a committee to consider the following requests of the company: The elimination of paving charges; a reduction in the gross receipts tax, and a change in fares from the present 7-cent cash fare with three tickets for 20 cents to a proposed 10-cent cash fare with three tickets for 20 cents, and if this is not enough, an increase in the ticket rate to three for 25 cents.



A Great Many of the Streets in Downtown Atlanta Are Narrow and Lined with Tall Buildings

Principal Changes Made

Briefly, the principal improvements made in whole or in part during the past two years to improve transportation conditions in Atlanta may be enumerated as follows:

1. Elimination of jitneys.
2. Purchase of a number of modern double-truck, one-man cars for city service and improved rolling stock on the interurban lines.

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3. Addition of a fleet of motor buses which are used in co-ordinated service with the trolleys.

4. Construction of island platforms at a number of points in the center of the city.

5. Correction of an anomalous fare situation on two suburban lines, due to the fact that because of an ancient franchise the through fare has been 5 cents, or less than the local city fare in Atlanta.

6. Better control of traffic at congested intersections.

7. Rerouting of certain lines to obtain better service and faster and more economical operation.

8. Elimination of a few parallel lines.

An effort will be made in this issue to cover all the points mentioned above with the exception of that of improved rolling stock. That story is so important and carries so many suggestions to other companies that it will be made the subject of a separate article. In a later issue, also, an account will be given of some very interesting features of transportation practice of the company, as carried out under the direction of William M. Casey, superintendent of transportation.

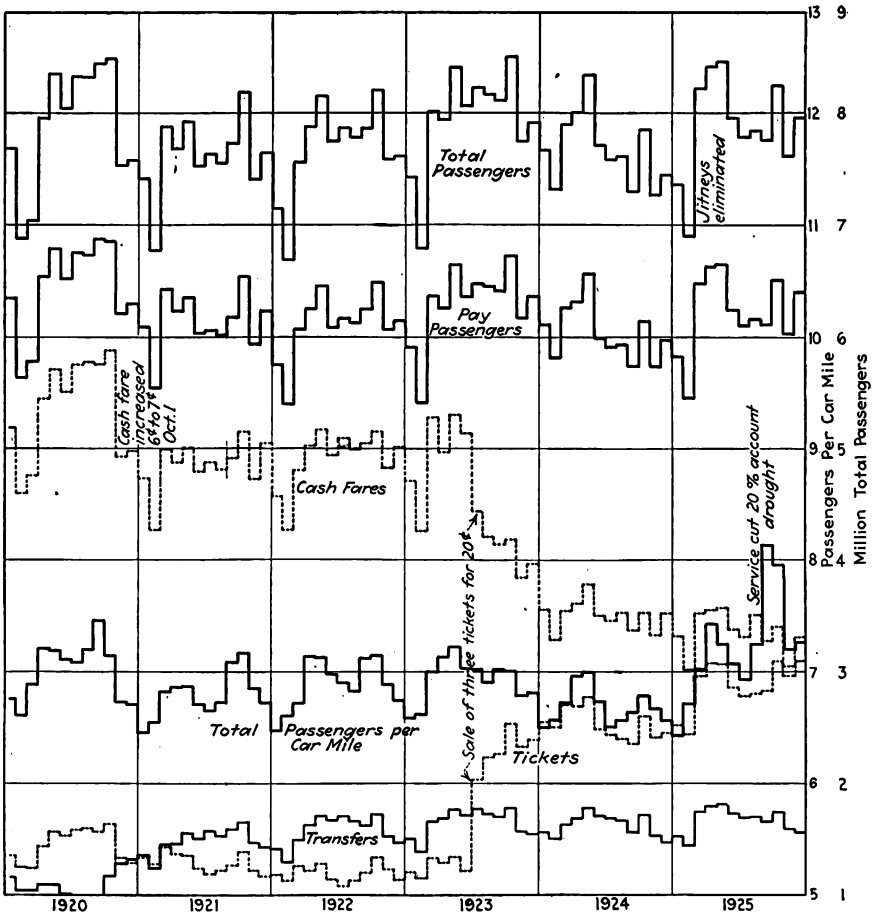

Chart Showing Classification of Passengers and Passengers per Car-Mile per Month for Last Five Years

Prior to April 14, 1919, the fare in Atlanta was 5 cents. On this date it was increased to 6 cents. On Oct. 1, 1920, it was increased to 7 cents cash, with fifteen tickets for one dollar. On July 1, 1923, the ticket rate was changed to three for 20 cents. These city rates do not apply on certain suburban lines where an extra charge is made or on two others where a low rate had to remain because of an old agreement.

Elimination of Jitneys

One of the first steps in the improvement of Atlanta's transportation was the abolition of the jitneys. This was accomplished very simply by a vote of the City Council not to renew any jitney licenses when they expired on March 1, 1925. It is estimated that during 1924 from 6 to 9 per cent of the total revenue passengers carried in the city traveled by jitneys and that their passenger revenue for that year was about $500,000. In practically every case these lines were competing directly with the street railway lines.

It was found that in most cases the railway service was sufficient to handle the jitney patrons and that they could be cared for with very little increase in car service. In return for the elimination of the jitneys the company agreed to put in several bus lines, as will be mentioned later in this article.

The elimination of the jitneys was followed by an increase in traffic on the car lines as shown by the gain in passengers carried from an average of about 7,670,000 per month in 1924 to an average of about 7,880,000 in 1925 and also by the much better form of the passenger line during the latter part of 1925, as given in the accompanying chart. There was also a great improvement in traffic conditions on the streets in Atlanta, as the jitneys paid very little attention to traffic regulations, and while they were on the streets were a continuous menace to the safety of persons walking or riding in other vehicles. There have been fewer street accidents and less street congestion in Atlanta.

Parking and Traffic Regulations at Crossings

Most of the streets in the downtown district of Atlanta are so narrow that the regulation of parking is an important matter. At present there are very few parking restrictions in the city. Where parking is not permitted the curbs are painted red, but this color will be changed to yellow so as to be more conspicuous. In an effort to improve conditions the Safety Council of Atlanta, with an associated committee of the national engineering associations, is making a study of the whole subject of street regulation and parking. The department stores have been asked by this joint committee to find out how many customers come to their stores. The City Council is considering prohibiting parking on one side of two main north and south and of two main east and west thoroughfares.

Traffic at the most congested crossings is now controlled by traffic signals which work synchronously, but their net result has been to slow down traffic. The average speed of the electric railway cars in the central business district is slightly under 5 m.p.h., whereas with traffic control under individual traffic officers, the average running time was 6.7 m.p.h. The period of the synchronous signals originally was 55 seconds for the main streets and 50 seconds for the side streets, with a four-second interval. This produced such a great slowing up of traffic that these times were cut to 30 seconds and 25 seconds respectively with a four-second interval. This shortening of the time interval

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has improved conditions somewhat, but the passage of a car through the central business district still takes 25 per cent more time than before the synchronized system was introduced. A study is now being made of the co-ordinated system of crossing signals used in Chicago.

The construction of island platforms has helped the loading problem in the center of the city and has also undoubtedly helped to speed up vehicular traffic as there is now less interference between pedestrians and vehicles. Six of these island platforms have already been built at important loading points and the company has an application for permission to construct three more.

Twenty-five Buses Now in Operation

The Georgia Railway & Power Company now has 25 buses, the latest purchased being Fageol gas-electric, with longitudinal seats on the upper deck. This upper deck is covered by an adjustable awning.

The first bus line to be operated by the company was one already in service, serving a real estate development. At the time the City Council decided to abolish jitneys the company agreed to take over these buses from the real estate company and continue to operate them. These buses, which are Mason Road Kings, do not run to the center of the city but are used as feeders to the car lines. They operate from the terminus of the car lines through the real estate developments. On these a 5-cent fare is charged where a transfer to the street railway is not wanted, but a 10-cent fare is charged when a transfer ticket is requested. This transfer ticket is accepted as cash fare and transfers to other lines are given on its presentation.

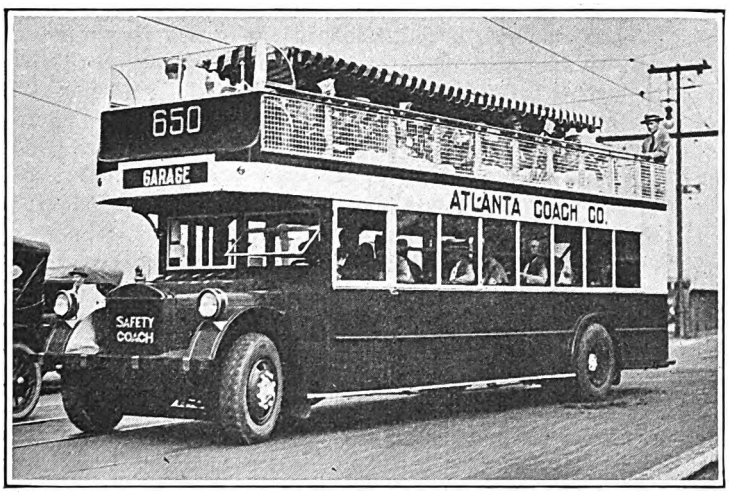
The gas-electric coaches operate to the center of the city and on these a straight 10-cent fare is charged with no transfers. The seating capacity of these buses is 60 passengers, 21 on the upper deck and 29 downstairs. The bodies are painted an attractive shade of red with cream from the middle upward. The seats on the lower deck are of leather upholstery.

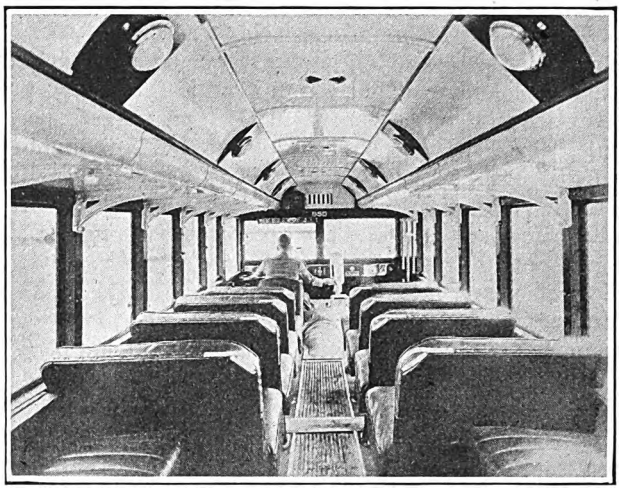
Six-cylinder Hall-Scott engines are used, connecting with G. E. generator and exciter units. The driving equipment consists of two G. E. motors mounted on the chassis. The transmission in the rear consists of two underslung worm drives, and no differential is used. The controller has five points: Reverse, neutral, series, parallel, and regenerative braking. In addition, all coaches are equipped with Westinghouse air brake, pneumatic door engines and all other modern safety features.

Air pressure is obtained by a special compressor pump geared to the engine and connected to two service reservoirs and is transmitted to the rear wheelbrake drums through two diaphragms supported on the rear axle housing and connected to the operating levers. Soft steel shoes expand on application of the air pressure against the inner side of the brake drum. The emergency brake, which is operated by hand, uses the same brake shoes and brake drums as the air system.

One-man operation is used on the buses, and all passengers enter at the front door. Both front and rear doors are used as exits, and both are operated from the driver's seat, though the rear door also can be operated from that end of the bus. The stairs leading to the upper deck are inclosed and passengers for both decks enter through the front door.

Operators for the buses were selected from street car trainmen of good record and long experience. They are paid 5 cents per hour more than the street car trainmen and are instructed in their duties at a special school conducted under the direction of the superintendent of employment and instruction.





Gas-Electric Double-Deck Buses at a 10-Cent Fare Have Been Added to Supplement the Car Service

The rule is followed of "a seat for every fare," and no standing is permitted on either deck under any conditions. The buses do not stop after the seating capacity is filled except to discharge passengers. Smoking is permitted on the upper deck. Because of climatic conditions in Atlanta, comfortable riding on the upper deck may be expected for eleven months of the year.

All of the buses are operated by the Atlanta Coach Company, a subsidiary of the Georgia Railway & Power Company, which is planning to build a garage to house 30 buses at a cost of about $55,000.

Forward-Looking Policy Justified by Results

It is satisfactory to be able to report that the liberal forward-looking policy followed by the company is showing results in greater revenue and lower operating costs. With the other improvements proposed it is expected that the railway, while not a bonanza, will pay a reasonable return on the investment.

The revenue during the last six months has shown an average increase of about 10 per cent.

The principal reductions in operating expenses have

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come from (1) rerouting, (2) use of modern cars, (3) improved schedules and (4) Economy meters.

All of the proposed rerouting, as explained, has not yet been put in force, because much of it has had to await the completion of two viaducts to be built across the railroad cut which divides downtown Atlanta. Nevertheless, some rerouting had been carried out and some trackage has thereby been made unnecessary and so has been taken up. It is estimated by the company that the rerouting already adopted has effected an annual saving of 627,706 car-miles. This, at 26 cents a car-mile, amounts to $173,203.

The saving from the company's recent one-man cars will be discussed more fully in a later article on this subject. It is sufficient here to say that the total savings from the 60 new cars ordered, in lower maintenance, power and transportation expenses, together with that gained through their larger capacity, increased speeds and reduced accidents, is estimated to be yearly $210,142. This represents about 25 per cent of the cost of the cars.

The gain from improved schedules comes principally from higher speed and better car loading during the non-rush hours. The latter point is illustrated by the very marked improvement in the "passengers per car-mile" line in the chart on page 794, although much of this improvement can also be attributed to the larger cars now used. Perhaps the best way of illustrating the gain made is to cite the greater expense which would have resulted with the same traffic if the conditions of earlier years had prevailed. Thus, if the 1925 passengers had been hauled under average 1923 carload conditions, 140,000 additional car-hours would have been required, which at 1925 platform expenses would have amounted to $152,000. In this comparison, 1923 is taken instead of 1924, since the conditions of 1924 were unusual because of jitney competition. Again, if the 1925 passengers had been hauled under 1923 speed conditions, 80,600 additional car-hours would have been required, amounting at 1925 costs to $86,700. This gain was not all net, as part of it came from larger cars and part of it from higher speeds, the cost of both of which should be deducted from the gross gain mentioned to secure the net gain. Thus, the better loading on larger cars, it is estimated, cost $33,000, whereas the net gain would be shown by the deduction of this figure from the gross gain or $152,000, making the net gain $119,000. In the same way, the increase in speed cost $39,000, which, deducted from the gross gain $86,700, gives a net gain of $42,700.

It is too early yet to state the exact benefit to be expected from the use of Economy meters, with which all of the double-truck cars are equipped. During the first month a saving of about 7 per cent was obtained. This corresponds to somewhat more than $40,000 a year. As the instruction of the platform men progresses, this gain should increase.

Gains in Future Changes

Other gains hoped for by the company to place the railway on a self-supporting basis are elimination of paving charges, a reduction in the gross receipts tax, and an increase in fares. The new schedule of fares requested by the company, as explained, is an increase of the cash fare from 7 cents to 10 cents plus an increase of the ticket rate from three for 20 cents to three for 25 cents if necessary.

The city has no control over the fares on the two suburban lines mentioned. Up to within a few months these lines presented the anomaly of charging a fare of only 5 cents, or 2 cents less than that on the local city lines. The public service commission was powerless to correct this situation and the courts refused to do so because of a clause contained in an old franchise.

About six months ago the company was able to effect an arrangement with the authorities of the principal city on one of these suburban lines, College Park, by which an increase in fare to 7 cents was obtained. It is hoped that the public in Decatur, the principal city on

In Cold Weather Awnings Are Not Used on the Upper Deck

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the other suburban line, will realize, as have the people in Atlanta, that their true interests lie in allowing the railway serving their community to have a living fare.

PUBLIC INDORSES COMPANY'S POLICY

It is generally difficult actually to appraise the real sentiment of the public in regard to policies followed by a public service corporation. Of course, it is usually easy to sense general approval of markedly conspicuous improvements like the addition of new, well-furnished cars. But conditions differ when the addition of new cars is accompanied with increase in fare, change from two-man to one-man operation, elimination of jitneys, requests for skip-stop service, still higher fares, relief from paving charges and other changes which really mean better service to the public, but whose immediate public benefit is not quite so apparent as the new cars. However, in Atlanta there is striking evidence that the public of Atlanta stands back of and indorses the efforts of the Georgia Railway & Power Company to rehabilitate its city system and put it on a paying basis. This is shown in many ways, but perhaps no more significantly than by the following incident:

Last year the *Georgian-American*, one of the Hearst chain of newspapers, announced it would present a cup to "Atlanta's most valuable citizen," and the responsible duty of selection was assigned to representatives of the city's leading civic organizations and of the city and county governments. This committee, after an exhaustive consideration of the subject, awarded the cup to H. M. Atkinson, chairman of the board of the Georgia Railway & Power Company, for the reason that: "He did more during the year in establishing a new industrial era in the region of which Atlanta is the center; more in promoting a higher standard and happier conditions of living, and was more directly responsible for Atlanta's steady growth, through the creation and operation of one of the greatest transportation systems in the country, than any other single agency."

In its report the committee cited, among other improvements made during the year by the Georgia Railway & Power Company, that it had purchased 60 new street cars of the most modern type, had established motor bus lines, operating fifteen new modern double-deck motor coaches, and had greatly improved practically all existing street railway lines.

There is no doubt that the chief officer of the local railway system often is a city's most valuable citizen. But it is none the less satisfactory to have this fact recognized during the lifetime of that citizen and that it should receive such general approval, as was the case in Atlanta.

New Uniforms for Trainmen a Cleveland Innovation

RALPH W. EMERSON, general manager of the Cleveland Railway, saw no reason why new uniforms should be adopted only when the type of vehicle should be changed. Besides, he never could understand why blue, one of the hardest colors to keep clean, should have been adopted in the first place.

For this reason he experimented with several types of uniforms, had samples of each made up, dressed up a few conductors and motormen in the different sample suits and sent them around to the various stations so that the trainmen might vote on the types they preferred. Decision was made, after this vote, for the same general design or cut, made up, however, from gray whipcord cloth, with nickel buttons.

The company has arranged to have these suits made by one manufacturer and sold by one retailer. The uniforms will be adopted gradually as the trainmen require new suits. On each new uniform the company absorbs a certain portion of the cost of the uniform, and also gives the trainman a new cap, reducing the cost of the new outfit to the trainmen to about $25.

To help in the maintenance of the uniform in a neat and tidy manner, the company has installed two tailoring shops, one at the Superior station and the other at Dennison. Pressing, mending and repairs of uniforms are done without charge to the trainmen.

Freight Development on Aurora-Elgin Line

Active Solicitation Has Brought Much Local Business —Shipments Are Interchanged with Eight Steam Railroads—L. C. L. Business Increased

DEVELOPMENT of freight business in the last three years on the Chicago, Aurora & Elgin property has been rapid. Freight revenues in the twelve months ended Nov. 30, 1925, were $311,188, as compared with $126,546 in the year ended May 31, 1922, an increase of 146 per cent during a period of approximately three years and six months. Car load freight earnings increased from $71,980 in the twelve months ended May 31, 1922, to $237,204 in the twelve months ended Nov. 30, 1925, an increase of 230 per cent, while less than car load earnings in the same period increased from $54,566 to $73,984, an increase of 36 per cent. This increase in freight revenues is in part accounted for by the rapid growth of the territory, but is largely the result of the intelligent and unremitting work of the management.

In consequence of close co-operation established with the real estate interests and municipal officials the traffic manager of the railroad was notified immediately of any construction work in the territory. When the municipal officials of a town decided to construct a concrete highway, that fact, along with the name of the successful contractor, was communicated to the traffic department, which at once got in touch with the contractor for the purpose of arranging to have all construction material shipped over the Aurora-Elgin. In most cases the municipal officials have been willing to co-operate by indicating to the contractors that they would be glad to have the local line favored. In the same way the real estate interests and suburban developers, before the beginning of each construction season, almost without exception have been willing to advise the traffic manager of the number of houses which they contemplated erecting and the names and addresses of the contractors who would handle the work. These shippers of material have been canvassed to secure the resultant freight business.

With the rapid growth of the suburban communities along the line came coal and lumber yards, builders' supply depots, gasoline distributing stations, etc. The traffic department of the railroad was energetic in calling attention to the possibilities for the establishment of such enterprises and in arranging to have them located adjacent to the Aurora-Elgin line. In many

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cases this was done upon land owned by the company, which was leased at a rental rendering a reasonable return upon the value of the property and usually with stipulations in the lease requiring the lessee to ship all or a stipulated proportion of his freight over the electric railroad. From time to time the railroad has built temporary sidings and team tracks for the purpose of accommodating road contractors or others having occasion for a limited period of time to ship a large amount of freight to some particular point.

The Elgin branch of the company's system runs through a country underlaid in large part with gravel. Prior to the organization of the present company several gravel companies had established plants on this branch. A substantial part of the increase in car load earnings has been the result of the activities of the traffic department in co-operating with these gravel companies in the extension of their sales as well as in fostering the establishment of other gravel enterprises upon this branch of the company's system.

Interchange of freight is made between the Chicago, Aurora & Elgin Railroad and the following steam railroads: Baltimore & Ohio, Chicago Great Western, Soo Line, Indiana Harbor Belt, Chicago & Northwestern, Elgin, Joliet & Eastern, Illinois Central and Chicago, Burlington & Quincy. In addition the company interchanges freight with the Elgin & Belvidere (which, in turn, connects with the Rockford & Interurban, making possible a through route from Chicago to Rockford), and with the Aurora, Elgin & Fox River Electric Company. A daily freight service is now operated in both directions between Rockford and Chicago.

The company is a member of the Central Freight Association, having the same status therein as the other railroads operating in the same territory. Joint tariffs are in effect covering practically every class of commodity moving in this territory. Through these interchange connections the Aurora-Elgin has been able to build up a profitable business as a terminal road in distributing car load freight to the various communities which it serves.

The following figures show the make-up of the more important classes of car load business and the growth in the revenues during less than three years time:

	Year 1922	Twelve Months Ended Sept. 30, 1925	Per Cent Increase
Coal	$14,849.18	$19,617.17	32
Gasoline	12,672.12	19,553.30	54
Coke	836.24	4,045.21	384
Crushed stone	5,527.57	10,419.55	89
Cinders	8,981.30	14,280.08	59
Sand and gravel	32,172.45	143,099.89	345
Cement	177.25	5,289.96	2884
Lumber	132.87	979.41	637

The growth in the volume of car load freight has required the expansion of the interchange facilities with practically every steam railroad with which connections are made and the enlargement of practically every team track siding in the suburban belt. All of the interchange business is handled in standard steam railroad equipment, which is rented on a per diem basis. A large part of the company's local business is also handled in steam railroad equipment, similarly leased. The growth in car load business has been particularly gratifying to the company because it is more profitable than the average run of l.c.l. business. Car load freight is handled entirely by electric locomotives. Less car load freight is handled principally by motor express cars.

In 1924 an arrangement was effected with the Chicago Tunnel Company under which the facilities of this underground system of freight delivery to a large part of the wholesale and retail district in Chicago was made available for the use of Aurora-Elgin shippers. The advantages to department stores, retail establishments, wholesale houses, etc., in shipping freight to points in the Aurora-Elgin territory over the Tunnel route and thence over the Aurora-Elgin—particularly the advantage of over-night delivery as compared with the slow movement of freight by the steam railroads—was called to the attention of shippers by personal letters, printed literature and personal canvasses by representatives of the traffic department. The volume of business handled in this manner is growing. The company is gratified at the progress which it has made in the development of l.c.l. business in the face of the rapid expansion in the network of improved roads throughout the territory which it serves and the growing use of private motor trucks in door-to-door deliveries.

For the purpose of taking care of the rapidly expanding l.c.l. business, new freight stations have been erected in Aurora and Elgin and the existing freight stations at a number of other points have been enlarged. The rapid growth in business has since required the enlargement of the Aurora station and the installation of an additional team track. In connection therewith and as a means of improving the passenger service out of Aurora, the company purchased a substantial area of land lying between the Fox River and North Broadway and relocated its line upon private right-of-way, taking approximately ½ mile of track out of the street. This materially reduced the liability to accidents through collisions with vehicles and increased to some extent the ability to make fast schedules, while giving additional space for the enlargement of freight facilties and taking care of future requirements with respect thereto.

New Passenger Stations for North Shore Road

TWO new passenger stations are planned for the Chicago, North Shore & Milwaukee Railroad, one at Mundelein and the second at Winnetka.

The Mundelein station will conform with the standard design recently adopted for North Shore Line stations, green tile roof, tapestry brick, white stone trimming, combining beauty of design with permanency of construction and providing every modern convenience for the public.

The Winnetka station, work on the foundation of which has already begun, will be at one of the most important business locations and will be built flush with the street on two sides and the track on a third. Because of the dimensions of the lot it will not be rectangular, but will conform in other details with the other stations.

Cement platforms to accommodate longer trains have already been completed at the Winnetka station site. These new platforms will also eliminate the blocking of the principal street of the village by trains stopping at the station.

The interior walls of the stations are to be of the same materials as the exterior, with terrazzo marble floors and green marble borders and base. The interior woodwork will be of forest green oak and the decorations light in color to provide maximum reflected light.

The Mundelein station will cost approximately $50,000. It will be ready for business by June 1, 1926.

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Energy Saving Campaign Nets $110,000 in Seven Years

Seattle Municipal Street Railway Has Reduced Energy Consumption from 4.48 Kilowatt-Hours per Car-Mile to 3.62—Charts Showing Records of Individual Motormen Are Used to Good Effect—The Clerical Work Is Not Burdensome

By S. E. Goodwin
Supervisor of Power Seattle Municipal Street Railway

IMMEDIATELY after the acquisition by the city of the street railway lines in Seattle in April, 1919, it was decided to equip 380 cars with Economy meters and institute an energy-saving campaign. During the time meters were being installed two instructors, picked from the ranks, were sent out to ride with the motormen and point out the habits and practices through which energy was being wasted and to demonstrate methods of saving it. The men were shown by stopwatch tests over measured track lengths that by proper acceleration and braking a car can be allowed to coast a large portion of the distance and arrive at the starting point in as short a time as if full power had been kept on up to a point where it was necessary to make an application of the air brakes.

Diagrams were posted at the carhouses showing two methods of bringing a car to a stop. In one the motorman keeps his controller in the full multiple position almost to the stop, then throws power off and immediately applies the air, often stopping too suddenly for the comfort of his passengers. This is one of the most wasteful practices that has been observed in street railway operation.

The other method is to accelerate quickly, throw off the power after the car has attained proper speed and then coast down to a low speed from which a stop can be made quickly by application of the air. This not only saves energy but reduces wear on brake shoes without loss of time.

Bulletins are posted from time to time directing special attention to coasting wherever possible, proper feeding of controller, correct manner of braking, explanation of electrical terms and other matters of energy-saving interest.

Motormen are required to fill out record cards of the type shown in an accompanying illustration. Meter readings at start and finish of run and leaving times at each end of line are recorded on the card. Mileage and kilowatt-hours are then figured and charts made up in the general office and sent out to the various carhouses.

Several methods of notifying motormen of their ratings have been tried, but the one now in use, the colored line method, originally developed in San Diego and used also by the Denver Tramway, has proved most satisfactory. Charts are posted each week show-

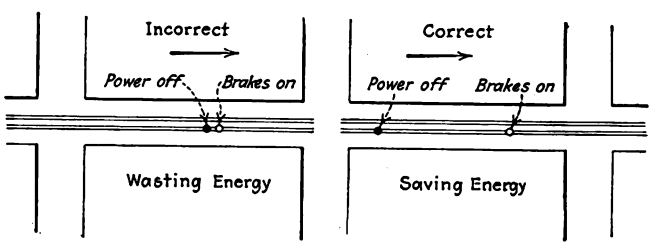
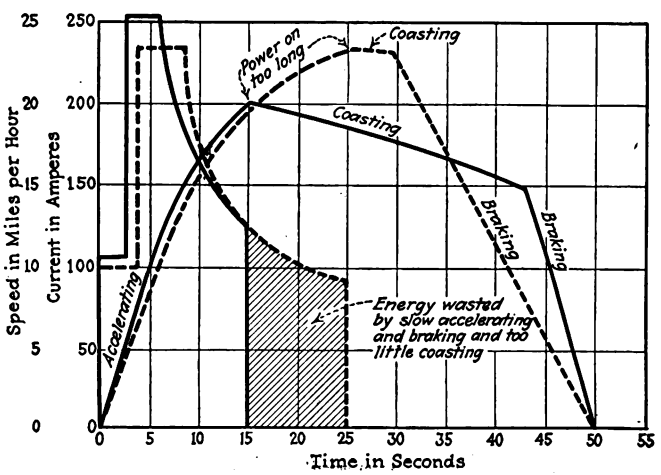


Diagram Posted in Carhouse to Show Motormen Right and Wrong Methods of Stopping Cars



Speed Time Energy Curves Used to Illustrate to Motormen the Principle of Energy Saving Possible with Increased Coasting

RESULTS OF ENERGY-SAVING CAMPAIGN, SEATTLE MUNICIPAL STREET RAILWAY

	Capital Charges			Operating Charges				Saving			
Year	Interest	Depreciation	Total	Instruction and Cash Prizes	Clerical and Stationery	Maintenance	Total	Kilowatt-Hours per Car-Mile	Miles	Gross Saving	Net Saving
1919	$ 428	$1,083	$1,511	$3,145	$4,350	$1,095	$8,590	0.096	11,774,219	$11,303	$1,202
1920	1,083	1,444	2,527	1,785	5,334	1,572	8,691	0.261	15,231,039	39,753	28,535
1921	1,083	1,444	2,527	.....	4,062	1,690	5,752	0.211	14,788,174	31,203	22,924
1922	1,083	1,444	2,527	.....	3,520	1,610	5,130	0.082	14,761,383	12,104	4,447
1923	1,083	1,444	2,527	.....	3,560	1,650	5,210	0.103	15,412,447	15,875	8,138
1924	1,083	1,444	2,527	.....	3,680	1,690	5,370	0.149	15,383,290	22,921	15,024
1925	1,083	1,444	2,527	.....	3,550	1,725	5,375	0.247	15,294,249	37,777	29,875
Total	....	.....	$16,673	.....	$28,060	$11,032	$44,118	.....	.....	.....	$110,145
Per meter			$43.87	.....	$73.84	$29.03	$116.10	.....	.....	.....	$290
Per meter per year			$6.49	$1.98	$10.93	$4.30	$17.20	.....	.....	.....	$43

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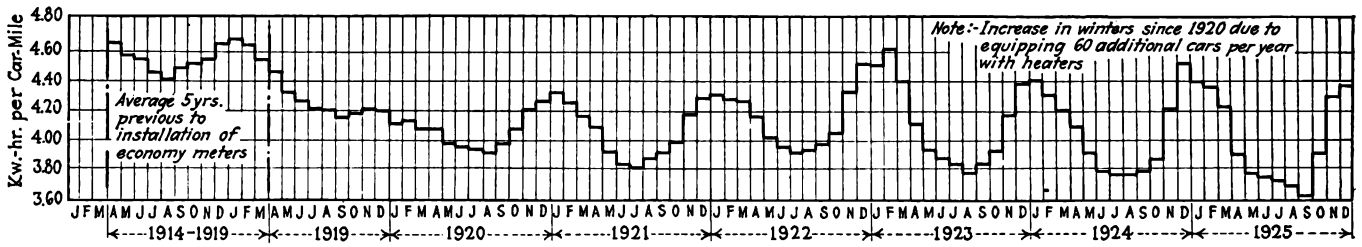


Energy Consumption at Switchboard 1914-1925

ing individual records on three or four lines, the period between postings of the same line averaging six weeks. A typical chart is reproduced herewith. Heavy vertical lines represent the average energy per car-mile at the car and the individual records are shown by horizontal shafts, blue areas to the left indicating energy saved and red areas to the right showing energy wasted. The purpose of the chart is to make the men whose records appear on the right of the average line improve their work. Those whose records indicate wasteful use of energy are given special instruction. There are three groupings for each line, day runs, swing runs and trippers and night runs. When two or more types of cars are used on the same line the individual kilowatt-hours are adjusted to correspond to the energy consumption of a standard type.

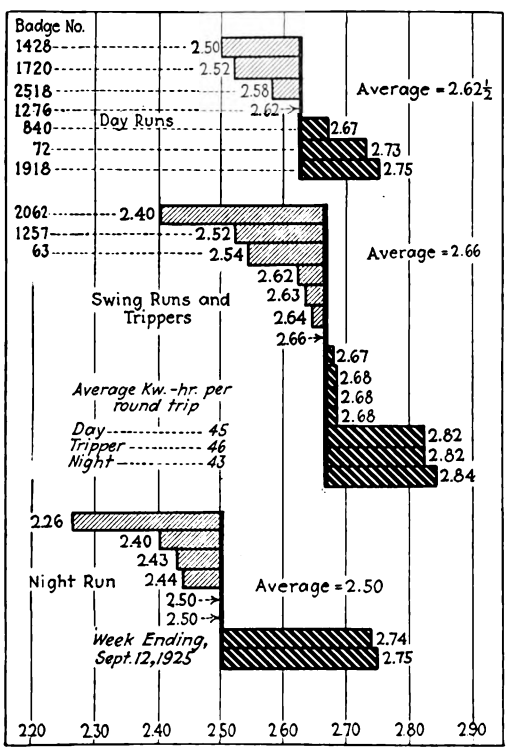
Substantial Savings Effected

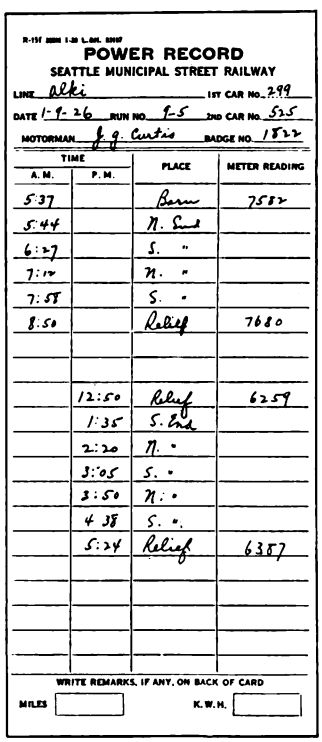
Yearly savings are calculated on the average of two years immediately preceding the start of the energy saving campaign. This base is 4.316 kilowatt-hours per car-mile at the switchobard. This is lower than the five-year average because of certain abnormal years prior to 1917. Due to a decrease in passengers per car-mile since 1919, a normal decrease in energy consumption has followed and a compensating factor has been allowed. An adjustment has also been made because of the electric heaters added to 60 cars in 1920.

A graphical record of kilowatt-hour consumption per car-mile for each month since April 1, 1919, as compared with the average five years previous to the city's taking over the lines is presented on this page. It will be noticed that despite the extra heating each winter during the past five years the peaks are not as high as that of the 1915 to 1919 average and the valleys show a steady decline. In September, 1925, the consumption per car-mile was 3.62, as against 4.48 the average September consumption for the five years previous to installing Economy meters.

Yearly savings in dollars and cumulative savings are shown in other charts. These show an average yearly saving of more than $16,000 for the seven-year period 1919-1925 inclusive and a cumulative saving of approximately $110,000.

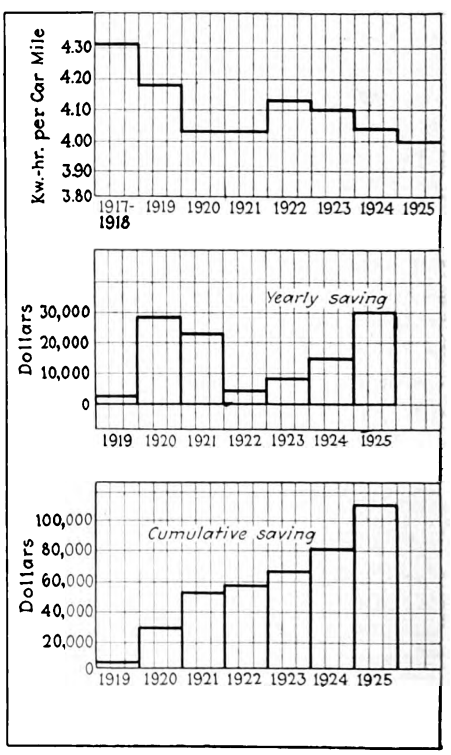
Since the adoption three months ago of the colored line method of advising motormen of their individual records, the results accomplished in energy saving have been particularly encouraging. Moreover, the superintendence overhead is small. Since 1920 the office force has consisted of a supervisor of power and two assistants, whose duties, other than energy saving, occupy about half of their time.




POWER RECORD
SEATTLE MUNICIPAL STREET RAILWAY
LINE Alki 1ST CAR No. 299
DATE 1-9-26 RUN NO. 7-5 2ND CAR No. 525
MOTORMAN J. J. Curtis BADGE NO. 1822

TIME A.M.	TIME P.M.	PLACE	METER READING
5:37		Barn	7582
5:44		M. End	
6:27		S. "	
7:17		M. "	
7:58		S. "	
8:50		Relief	7680
	12:50	Relief	6259
	1:35	S. End	
	2:20	M. "	
	3:05	S. "	
	3:50	M. "	
	4:38	S. "	
	5:24	Relief	6387

WRITE REMARKS, IF ANY, ON BACK OF CARD
MILES K.W.H.



At Left, Chart Comparing Individual Energy Consumption Record of Motormen. In Center, Seattle Motormen Are Required to Fill Out Cards Showing Meter Readings at Start and Finish of Run and Leaving Times of Trips. At Right, Reduced Kilowatt-Hour Consumption per Car-Mile Has Resulted in Substantial Savings

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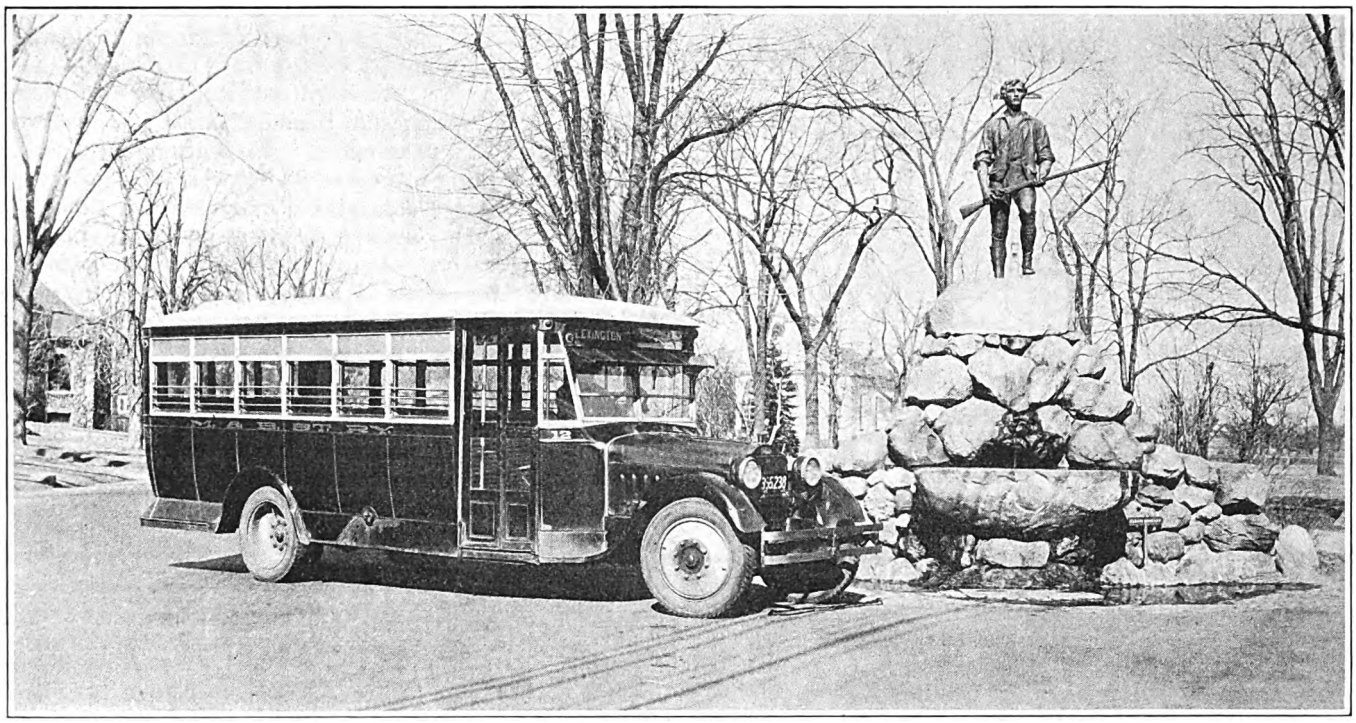


Middlesex & Boston Bus at Lexington on the Original Route Running from Concord to Arlington

Bus Service Expanded in Middlesex

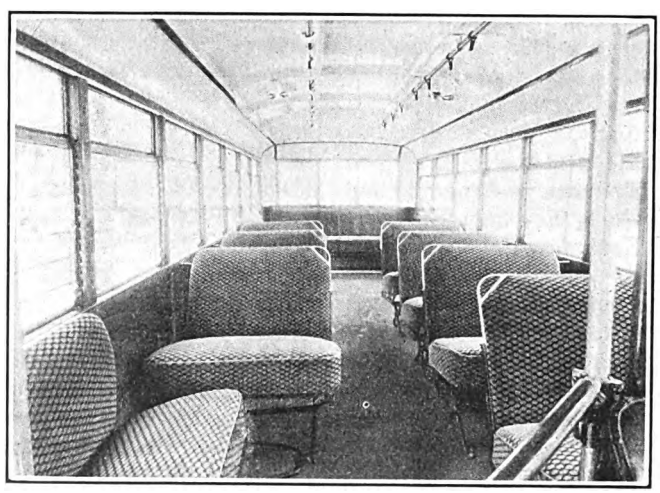
Substitution of Buses for Cars on Three Routes by the Middlesex & Boston Street Railway Has Resulted in Increased Riding—Present Operation Is More Regular and More Flexible than that Formerly Given on Single-Track Lines—Equipment Has Been Standardized

COMPLYING with a request made by the cities of Waltham and Newton, the Middlesex & Boston Street Railway, Newtonville, Mass., during the past year has substituted buses in place of cars on three of its lines. Prior to the change on these lines the railway had already undertaken bus operation on two of its routes. Experience obtained during the fifteen months of operation of the first two routes and during the shorter period since the new routes were established indicates that the change will result in improved transportation service and will benefit both the public and the company.

Bus operation was first undertaken by this railway during the latter part of 1924, as told in ELECTRIC RAILWAY JOURNAL for Dec. 6, 1924, p. 955. The original lines were from Concord and Billerica to Arlington along a route 17 miles in length, and from Wayland and Framingham to Natick along a route 10 miles in length. Both of these bus routes replaced single-track car lines.

During the summer of 1925 the company had to suspend car service on the line between Lexington and Waltham due to the construction of a new sewer, necessitating the temporary removal of the railway track from the street. On July 16 the company inaugurated bus service along this route to take the place of the suspended car service. This has proved so satisfactory that bus operation has been continued since the completion of the sewer construction work.

Following the successful establishment of bus service in these instances, the cities of Waltham and Newton suggested to the company that a similar substitution should be made on other lines. A route from Newton Corner to Waltham, known as the Crosstown line, and another from Newton Corner to Auburndale via Waltham, known as the Bemis line, were considered by the management as the logical ones upon which to try the experiment.



Figured Gray Mohair Upholstery Gives a Pleasing Appearance to the Bus Interior

In many respects the bus operation on the three routes described has proved more pleasing to the public than the former car service. Schedule speed is the same as that formerly operated

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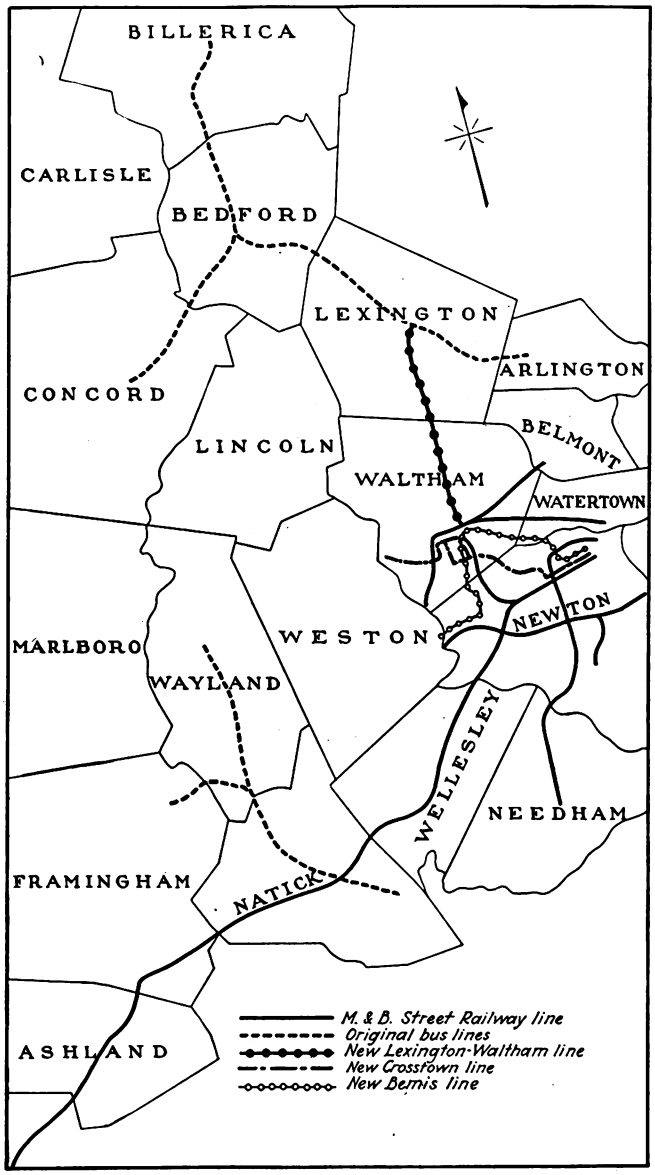

New Bus Routes Between Newton Corner, Waltham and Auburndale and Between Lexington and Waltham Have Recently Been Established by the Middlesex & Boston Street Railway in Addition to the Original Routes from Concord and Billerica to Arlington, and from Wayland and Framingham to Natick

by the cars, but headways are more regular than it was possible to operate on these long single-track lines. A summary of the routes now operated, with their length, schedule speed and number of buses required, is given in an accompanying table. Plans for changing over other routes from cars to buses during the present year are under consideration by the company.

All bus lines operated by the Middlesex & Boston Street Railway are now carrying more passengers than were carried by the car lines which they have replaced. Fares are the same as the old car fares, 10 cents per zone with free transfers. Substitution was made at the beginning on the basis of one bus for one car, but it has been found necessary to augment the bus service so that on some lines the bus mileage is now approximately 30 per cent greater than the car mileage used to be.

Operating cost has thus far averaged somewhat under 30 cents per bus-mile, with operating revenue slightly in excess of that figure. Depreciation, included in the foregoing cost figures, is calculated on a basis of four years of life for the buses. Each bus averages about 40,000 miles per year, making the total life thus calculated 160,000 miles.

The railway has standardized its bus equipment, using White chassis and Bender bodies. It has ten buses seating 23 passengers, two seating 25, and 22 seating 29, making a total of 34 vehicles. Seventeen of the latest buses are upholstered in gray figured mohair, as shown in an accompanying illustration. A number of other interesting features have been incorporated in the design. Wireglass is used in the rear windows to do away with the need for protecting rods. Cloudy glass is used in the upper window sash. This prevents the sun shining through the windows into the eyes of passengers and renders window curtains unnecessary. Straps for standees, while not included in the original design, have now been installed at the request of the public. The company has also standardized on Seiberling tires.

Buses are housed in three garages, at Waltham, Lexington and Natick. These are parts of the existing carhouses. The old pits have been filled in and concrete flooring laid. Of these the largest, at Waltham, is now housing sixteen buses. The second largest is at Lexington, from which thirteen buses are operated, and the smallest is at Natick with five buses. The amount of service operated varies slightly from time to time, depending on weather conditions, etc., but it is the practice to have nearly all of the buses on the road in the rush hours.

BUS ROUTES OF MIDDLESEX AND BOSTON STREET RAILWAY

Route Between	Date Established	Length, Miles	Speed, M.P.H.	Number of Buses
Concord, Billerica and Arlington...	September, 1924	17	13	10
Wayland, Framingham and Natick.	September, 1924	10	10	5
Lexington and Waltham.....	July 16, 1925	5	13	3
Newton Corner and Waltham.....	January 10, 1926	5	12	9
Newton Corner and Au burndale...	March 14, 1926	7	9½	7
Total.....		44		34

During the severe snow storms of the past winter the buses were able to give somewhat better service than the cars. This was due to a large extent to the harmful effect of automobile traffic packing the snow in the grooves of the rail. Car headways operated by the Middlesex & Boston range from fifteen minutes to one hour. These were found to be insufficient to keep the track clear with snow falling as rapidly as it did during the February storms. This rapid accumulation also resulted in the stalling of snow-fighting equipment in deep cuts along private rights-of-way, thereby increasing the difficulty of keeping open the rail lines.

Snow removal from the streets on which the buses operate is carried out by the cities, towns and the state of Massachusetts. This is done in return for a license fee of $5 per bus seat. Although the first of the severe storms of the past winter caught both the municipal and railway snow-fighting organizations unaware, it was possible by energetic work to keep the bus routes open at all times.

The Chicago Surface Lines are "horseless." The last ten horses have been sold. They were the remnant of a force which has been steadily decreasing for 80 years. In 1893, the year of the Chicago World's Fair, the lines operated with 10,000 horses. In recent years a few have been kept for trucking or for drawing service wagons into the congested loop.

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Depreciation an Important Factor in Baltimore Valuation

Cost to Reproduce New Less Depreciation Used as Basis for $77,000,000 Allowed the United Railways & Electric Company by Maryland Commission — Easements Were Included as an Element of Value

CONSIDERABLE attention was paid in the recent valuation of the United Railways & Electric Company of Baltimore to the items of depreciation and easements. In reaching the final figures, as published in this paper for March 13, 1926, page 459, the majority opinion valued the physical property, overheads, working capital and going value at $70,000,000 and the easements at $7,000,000. In the hearing of the case the United Railways claimed a total valuation of $106,641,360, to reproduce new, less depreciation, which included easements. Clarence W. Miles, people's counsel, conceded a value of $60,577,150, which did not include any allowance for easements. Mr. Miles opposed placing any value on the easements. In this Commissioner Harper concurred. The commission, however, received a ruling from the Attorney-General of the state holding that the easements should be included.

The principles on which the company's and the city's cases were based were given in an article by W. H. Maltbie in the issue of Jan. 9, 1926, page 69.

The majority opinion pointed out that in arriving at the figures the commission had considered the cost to reproduce the property new, the amount of depreciation existing in the property, or its per cent condition as of Jan. 1, 1924, original cost so far as that could be determined, and the par and market value of securities outstanding against the property.

The valuation placed on the various items by the people's counsel, the United and the commission are set forth in the majority opinion with an explanation of how each was arrived at. The individual items are given in the accompanying table, which was included as an appendix to the opinion.

In connection with the item of passenger and combination cars the commission said the people's counsel arrived at his cost of reproduction by applying to the

COMPARISON OF ESTIMATES OF PEOPLE'S COUNSEL AND OF RAILWAY COMPANY WITH FINDINGS OF PUBLIC SERVICE COMMISSION OF MARYLAND AS TO COST OF REPRODUCTION, PRESENT CONDITION AND GOING VALUE, BUT WITHOUT EASEMENTS, AS OF DECEMBER 31, 1923, OF THE PROPERTY OF THE UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE

	Account Physical Property	Cost to Reproduce New — People's Counsel	Railway	Commission	Per Cent Condition — People's Counsel	Railway	Commission	Cost to Reproduce New Less Depreciation — People's Counsel	Railway	Commission
502	Right-of-way	$167,576	$745,719	$248,573	100	100	100	$167,576	$745,719	$248,573
503	Other land used in electric railway operations	1,336,380	1,850,662	1,748,417	100	100	100	1,336,380	1,850,662	1,748,417
504	Grading	1,836,582	2,239,931	2,210,453	87.2	100	100	1,600,397	2,239,931	2,210,453
505	Ballast	1,752,803	2,093,940	1,967,588	95	84	80	1,665,163	1,758,910	1,574,070
506	Ties	1,292,828	1,537,461	1,435,507	65	84	80	840,338	1,291,467	1,148,406
507	Rails, rail fastenings and joints	3,422,424	4,050,495	3,849,014	72	84	80	2,464,145	3,402,415	3,079,211
508	Special work	2,514,331	2,993,016	2,814,396	67	84	80	1,684,602	2,514,133	2,251,516
510	Track and roadway labor	3,663,490	4,825,215	4,583,955	65	84	80	2,381,269	4,053,181	3,667,164
511	Paving	2,755,465	3,297,811	3,165,038	80	84	80	2,212,372	2,770,161	2,532,030
512	Roadway machinery and tools	119,842	119,842	119,842	70	70	70	83,889	83,889	83,889
515	Bridges, trestles and culverts	1,307,327	1,281,419	1,281,419	80	82	82	1,045,862	1,046,474	1,050,764
516	Crossings, fences and signs	88,983	97,094	88,983	87	89	87	77,415	86,601	77,415
517	Signals and interlocking apparatus	137,579	153,583	145,897	90	98	95	123,821	150,511	138,602
518	Telephone and telegraph lines	289	305	305	90	90	90	260	274	275
519	Poles and fixtures	1,138,441	1,338,820	1,195,363	85	91.5	90	967,675	1,225,020	1,075,827
520	Underground conduits	189,464	219,723	219,723	95	96	95	179,991	210,934	208,737
521	Distribution system	3,256,822	3,852,902	3,549,645	88	89	88	2,866,003	3,449,118	3,123,688
523	Shops and carhouses	4,207,565	4,441,435	4,350,000	71.3	93	87	2,997,029	4,127,027	3,784,500
524	Stations, miscellaneous buildings and structures	318,324	340,799	335,598	79.7	90.6	85	253,704	308,452	285,258
526	Park and resort property	489,272	608,574	510,877	73.7	90.6	80	360,593	551,190	408,702
529	Other expenditures— Way and structures. Trackless trolley construction	45,676	45,676	45,676	90	90	90	41,108	41,108	41,108
530	Passenger and combination cars	10,527,765	12,009,033	11,486,901	70	90	85	7,369,436	10,824,518	9,763,866
531	Freight, express and mail cars	39,322	52,094	49,829	50	90	80	19,661	46,885	39,863
532	Service equipment	477,729	454,148	487,237	55	80	80	262,751	363,318	389,790
533	Electric equipment of cars	5,747,935	6,087,930	6,087,930	70	90	85	4,023,554	5,479,137	5,174,741
536	Shop equipment	350,596	350,595	350,595	80	80	80	280,477	280,476	280,476
537	Furniture	270,721	270,720	270,720	80	80	80	216,577	216,576	216,576
538	Miscellaneous equipment	153,012	153,012	153,012	65	60	60	99,458	92,007	91,807
539	Power plant buildings	43,325	46,095	45,500	65	93	85	28,115	42,868	38,675
540	Substation buildings	448,061	478,810	473,822	81	93	85	363,891	445,293	402,749
542	Power plant equipment	169,972	169,972	169,972	70	76	70	118,980	127,479	118,980
543	Substation equipment	1,837,859	1,837,859	1,837,859	85	92	90	1,562,180	1,690,830	1,654,073
544	Transmission system	642,083	759,898	718,046	90	90	90	577,875	683,908	646,241
	Total	$50,759,843	$58,804,588	$55,997,692	75.3	88.7	85	$38,272,547	$52,181,743	$47,556,442
	Overheads									
501	Engineering and superintendence	3,299,975	2,940,229	2,799,884	100	100	100	3,299,975	2,940,229	2,799,884
546	Law expenditures	253,799	1,176,092*	559,977	100	100	100	253,799	1,176,092*	559,977
547	Interest during construction	4,587,296	7,393,097	5,072,717	100	100	100	4,587,296	7,393,097	5,072,717
549	Taxes	462,229	462,229	462,229	100	100	100	462,229	462,229	462,229
550	Miscellaneous	2,539,240	1,826,832†	3,589,186	100	100	100	2,539,240	1,826,832†	3,589,186
	Cost of financing	3,166,425	4,476,184	.....	100	100	.....	3,166,425	4,476,184	.....
	Total	$14,308,964	$18,274,663	$12,483,993	100	100	100	$14,308,964	$18,274,663	$12,483,993
	Total of physical property and overheads	$65,068,807	$77,079,251	$68,481,685	80.7	91.4	87.7	$52,581,511	$70,456,406	$60,040,435
	Working capital	1,400,000	2,000,000	1,500,000	100	100	100	1,400,000	2,000,000	1,500,000
	Total	$66,468,807	$79,079,251	$69,981,685	81.2	91.6	88	$53,981,511	$72,456,406	$61,540,435
	Going value	6,506,881	16,000,000	8,560,210	100	100	100	6,506,881	16,000,000	8,560,210
	Grand total	$72,975,688	$95,079,251	$78,541,895	82.9	93	89.2	$60,488,392	$88,456,406	$70,100,645

* Includes administrative and legal expense. † Includes organization prior to construction, $1,764,138; and insurance during construction, $62,694.

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original cost of each of the 1,357 used and useful cars a multiplying factor based on the trend of costs given to the trade by the J. G. Brill Company for the period from 1914 to 1924, and on information secured by Robert M. Feustel, consulting engineer, from the Brill company on the trend of prices previous to that date; to the trended cost so secured he added 1 per cent for omissions and contingencies. The commission said that neither the people's counsel's nor the company's estimates include any allowance for several hundred cars of antiquated design still retained by the company, but not used and having no prospect of being used. The company did include the cost of 110 open car bodies which at the date of valuation were being rebuilt into permanently coupled units. The cost trend referred to did not include shop overhead costs of the cars. The company's estimate was based upon the figures furnished by the J. G. Brill Company as to the reproduction cost of these cars, including shop overheads and 15 per cent profit. The commission said that after careful consideration of all the testimony in regard to the value of the used and useful cars and excluding several hundred obsolete cars, it accepted the cost figures presented by the Brill company, with the exception that it reduced the profits from 15 to 10 per cent, which brought its reproduction cost to $11,486,901.

The railway company did not make any separate claim for legal expenses, but made a claim for administrative and legal expenses combined, amounting to $1,176,092, practically 2 per cent of items covering the total of physical property. The commission made an allowance of $559,977.

Under the item of Miscellaneous the commission said:

The company included insurance, organization prior to construction, and legal and administrative expenses. People's counsel included organization prior to construction, and administration during construction, but made no allowance for insurance. If it is considered that of the 2 per cent claimed by the company for legal and administrative expenses one-half of 1 per cent is for legal expenditures, the other 1½ per cent would be for administration during construction.

In the people's counsel's estimate there was included under Miscellaneous an item of 5 per cent, and for purposes of comparison we have divided this so that 2 per cent is for organization prior to construction and 3 per cent for administration during construction.

The following are the estimates of the various items: Organization prior to construction—people's counsel's estimate, $1,015,697; railway's estimate, $1,764,138. The company's figure is 3 per cent of the total physical property, while the people's counsel's figure is 2 per cent of the total physical property.

Administration during construction—people's counsel estimated $1,523,543, the company estimated $882,069. The people's counsel's estimate is based on 3 per cent of the total value of the physical property, while the company's claim is for 1½ per cent of the total value of the physical property. This difference is brought about by the fact that the company, in claiming a general contractor would be employed, figures that the cost of administration during construction would be less with a general contractor than if one were not employed.

Insurance—The company estimated $62.694. This is the actual insurance paid by the company during the year 1923. People's counsel made no allowance for insurance, as he claimed all necessary allowances were made in the base cost.

The total claims for both the company and the people's counsel for this miscellaneous item are as follows: People's counsel's estimate, $2,539,240; railway's estimate, $2,708,-901. The commission has included all the above items and in addition, as provided for in the classification of accounts, has included such expenses and cost of financing as would be incurred by the company as explained in the discussion of costs of financing, no separate allowance has been made elsewhere for this item. The commission arrived at a figure for the miscellaneous account of $3,589,186.

Under working capital, people's counsel claimed $1,400,000 and the company $2,000,000. Both included approximately $1,000,000 as the cost of necessary materials and supplies on hand. The commission allowed this $1,000,000 and approximately two weeks operating expenses amounting to $500,000, giving a total of $1,500,000.

The per cent condition of the completed property, as claimed by the railway, was 91.7. The people's counsel's claim was 81.3. The condition found by the commission was 88 per cent.

For going value the commission adopted the figure of 12½ per cent of the physical property and overheads, not including working capital, or $8,560,210.

The company claimed that the original cost of the property at the time of the consolidation in 1899 was at least $42,621,455. The cost of the net additions since that time have been $25,537,453. The company therefore claimed as of Jan. 1, 1924, that the original cost of the property was at least $68,158,908. People's counsel claimed that the original cost at the time of the consolidation was $32,000,000, and adding the $25,000,000 in additions, that the original cost of the property as of Jan. 1, 1924, was $57,000,000.

After summing up the various elements entering into the determination of a fair value of the property the commission found the fair value of the property, without easements, to be $70,000,000.

The opinion discussed the question of easements at some length. This was the only subject upon which all three members of the commission could not agree. The majority opinion valued these at $7,000,000, bringing the total valuation to $77,000,000.

During the course of the investigation and hearings three subjects which had nothing to do with the valuation came before the commission. These included the rerouting of the street cars, the removal of one-man cars from the Halethorpe line, both of which are being considered by the Baltimore Traffic Survey Commission, and the issuing of a weekly pass at a fixed rate. In regard to the weekly pass the commission stated that it feels it would be unwise to require the railway company to embark on such an experiment. Continuing, the commission said:

Proponents of the weekly pass idea testified that it was "a gamble," that there was no way of checking the results of the pass upon the revenues of those companies in other cities, but their general impression was that it had been helpful.

In view of the testimony submitted, this commission does not feel justified in requiring the company to issue such a pass or ticket, and it would hesitate to approve such a plan if it were proposed by the company, on the ground that it would be a marked departure from the plan of measured service, under which the patron of a utility pays for what he receives, and toward the plan of unlimited service for a fixed charge, or flat rate.

As the period for which the present rate of fare was ordered to remain in force expires with the determination of the present case, and as the rate of fare was not an issue in the valuation proceedings, the commission will, in its order, require the continuance of the present base rate fare of 7½ cents when tickets or fare checks are purchased, or 8 cents cash, until April 30, 1928, with the provision that if any proceedings involving the rate of fare be pending at the expiration of that period, then the present rate will be continued for an additional period of six months unless such proceedings shall be terminated before the expiration of that time.

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CHICAGO SURFACE LINES

CHICAGO, ILL., April 29, 1926.

To the Editor:

The leading editorial in your issue of April 24 headed "The $6,000,000,000 Won't Be Wiped off the Books" is in line with the best thought in the electric railway industry and I desire to compliment you upon the forceful presentation of facts.

Electric railways have long since emerged from the doldrums of the war period. Without the governmental assistance required by the steam railroads and without, in most cases, even a sympathetic attitude on the part of public officials, they have worked out their own salvation.

It is astonishing, therefore, that anyone at this time should make such misleading statements as those credited to Mr. Loree.

The industry is on a sound economic basis. Last year was the greatest year of electric railway history. More passengers are being carried, management is more alert and service is more responsive to public needs than ever before.

To men of vision the future is bright. There is prosperity and usefulness ahead for those willing to adjust themselves to changing conditions.

G. A. RICHARDSON,
Vice-President

KANSAS CITY RAILWAYS

KANSAS CITY, MO., May 1, 1926.

To the Editor:

Permit me to express my appreciation of the editorial in the April 24 issue of the JOURNAL on Mr. Loree's reported statement that the $6,000,000,000 invested in electric railway facilities be charged off as a loss. It is forceful and constructive and reflects the mature, carefully considered judgment of those charged with the responsibility of financing and operating these public service utilities.

Mr. Loree undoubtedly, if given an opportunity to enlarge upon what was evidently a statement *obiter dicta*, would so qualify it and apply it as to give it an entirely different meaning. There are today unquestionably railway enterprises that should probably never have been built, those that changed conditions have rendered obsolete. But by the same token there are steam carriers in the same category. It is as wrong to judge the whole by these sick parts on the one hand as it is on the other.

The very vital necessity of the street railway is the only thing that kept it alive during the period from 1915 to 1920. The industry simply had to carry on because its collapse would have meant disintegration of business values and paralysis of urban life.

There is no especial fetich in motive power or roadway. If the thousands of men who are living daily with the problem thought that their interests and the interests of those they serve could be better served by a change in motive power or a switch from steel to rubber they would recognize the fact. Such a change would not keep them from being in the transportation business. The proof of this is the fact that 300 electric railway companies are using the bus as a tool of their trade, adapting it and co-ordinating it in comprehensive mass transportation plans. But they are continuing to look on the railway as the backbone of the entire service and are spending millions of dollars for new electric equipment and facilities. Surely these men, operators, executives, bankers, are not all wrong. I do not believe the record of the past few years in Brooklyn, in Pittsburgh, in Chicago on the North Shore, and in many other places, would support the statement that the electric railway is through as a proper method of handling mass transportation at the minimum cost.

F. G. BUFFE,
General Manager.

THE BEELER ORGANIZATION

NEW YORK, April 30, 1926.

To the Editor:

Your leading editorial in the JOURNAL of April 24, under the caption "The $6,000,000,000 Won't Be Wiped Off the Books," is timely and has a real message that should be heeded. A large share of the trouble with the traction industry today is that many of the men interested in it are not sold themselves. They have a feeling that something is going to happen, and they hesitate. There is no doubt that something will happen if they hesitate too long. The scriptural quotation "What I feared came upon me" is applicable here.

I have a number of friends who are steam railway men and their attitude generally toward the traction industry is and has always been one of good-natured contempt. They feel sorry for any management that has to subsist by collecting nickels and pennies. All steam railway men may not feel this way, but most of those whom I know do. The fact that traction lines haul ten times as many passengers annually as all the steam railroads is apparently lost sight of.

The universal abolition of traction lines in the near future is no more probable today than the wiping out of all steam railroad passenger traffic business on account of great increase in the use of the automotive vehicle and other competitive methods of travel. The managements, however, that lag behind and do not keep their service up to date will suffer, whether operating traction lines or steam railroads. JOHN A. BEELER.

P., L. & M. Electric Locomotive Tested

DURING the latter part of 1925 the Oerlikon trial locomotive, type 2BB2, built for the Paris, Lyons & Mediterranean Railway, was subjected to exhaustive tests both as regards running and regenerative braking. This locomotive has an output of 2,400 hp. at 31 m.p.h. and a maximum speed of 68 m.p.h. The trials were entirely successful and the locomotive has now commenced its period of guarantee. The running tests covered the whole range of operation of the locomotive up to the highest speed and maximum load. The trials with regenerative braking were carried out under varied speed conditions and the stipulations of contract satisfied. The latter laid down that the electric braking equipment was to be capable of dealing with a total train load of 300 tons, including a weight of locomotive of 120 tons, on a gradient of 1 in 33, the speed being maintained at 22 to 25 m.p.h. During these tests a current of 600 amp. at 1,500 volts was fed back into the system with the train traveling at 25 m.p.h.

The method of regenerative braking evolved by the Oerlikon Company for these direct-current locomotives is very simple. The same controller handle which serves for starting up and running is also used for braking; the driver has only to know what grouping of motors is required for the speed at the time.

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Maintenance Notes

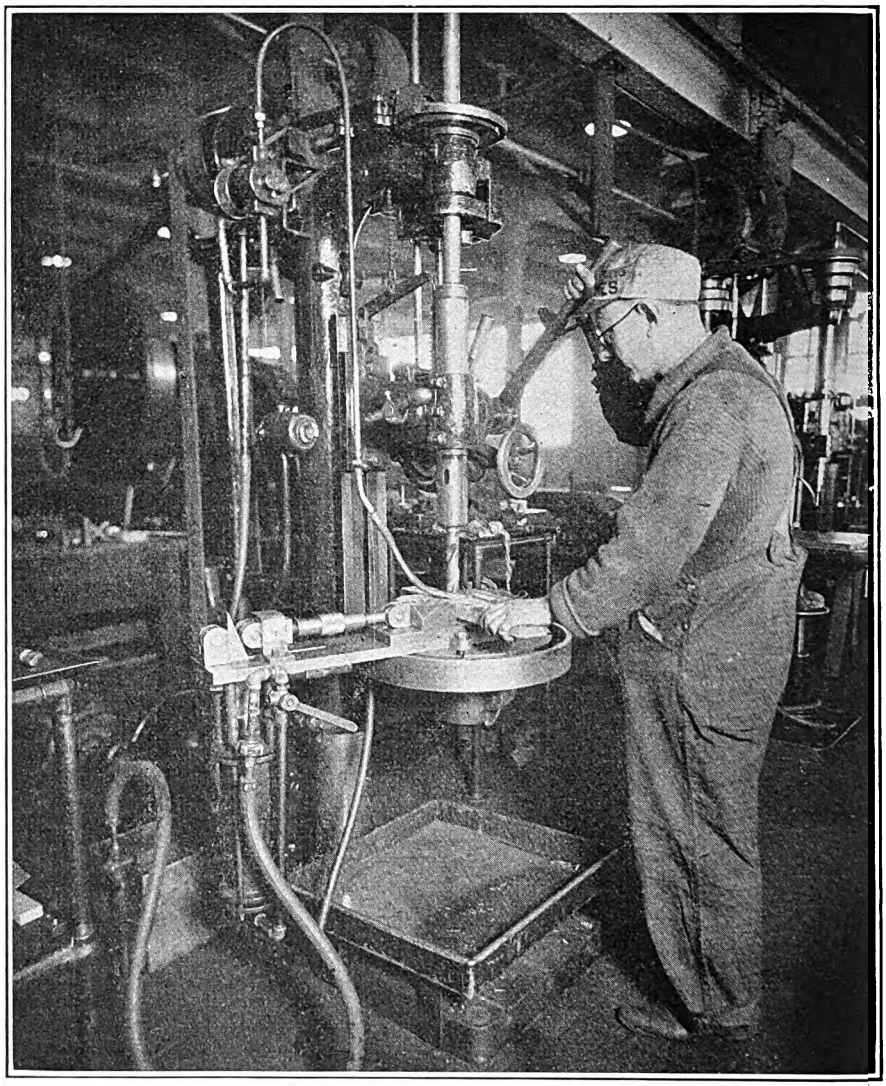
Air-Operated Chuck Used with Drill Press

CLAMPING and holding material firmly during drilling often consumes nearly as much time as the drilling operation itself. Many railway shops have equipped their drill presses with hand vises, so that the material may be clamped securely in position without loss of time. An improvement on this method is an air-operated chuck constructed in the shops of the Department of Street Railways, Detroit, Mich., which has been applied to one of the drill presses most used. This has proved an additional time and labor saver over other methods in that work of almost any shape can be clamped quickly and firmly. An accompanying illustration shows the construction.

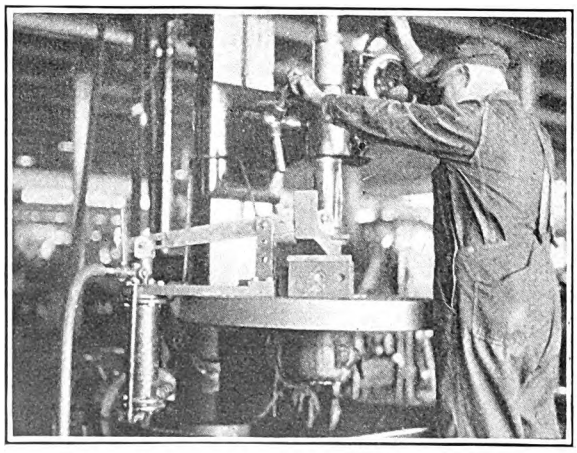
The mechanism consists of an air cylinder about 4 in. diameter by 15 in. long. The plunger of this cylinder is connected directly to a wedge, which when pushed upward acts through rollers on a horizontal arm to close the jaws of the chuck. In order to provide for different sizes of material, the connecting arm is provided with a screw adjustment in the center, and by lengthening or shortening the rod the opening of the jaws is increased or decreased.

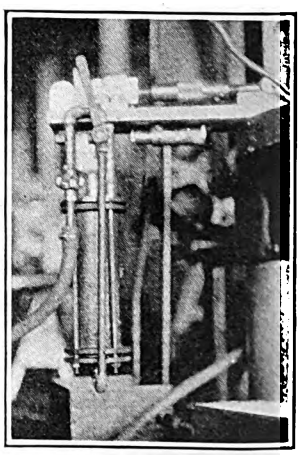
In order to provide a firm clamping for irregular material, the stationary side of the jaw is pivoted at the center, and by providing clearance at the ends this will swivel slightly and so will conform to the shape of the piece which is to be clamped. In ordinary operations air from the shop system is used, which is from 80 to 90 lb. pressure. The connection from the shop line to the cylinder is through a flexible hose and piping with three-way valve. In one position air is admitted to the bottom of the cylinder, so as to force the plunger upward and in the reverse position air is exhausted so as to remove the pressure.

Another air-operated clamping device constructed somewhat along the lines just described is used to hold material to the bed of a drill press during drilling. This mechanism



Air-Operated Chuck and Liquid Circulating System as Applied to a Drill Press in the Shops of the Department of Street Railways, Detroit





At Left, Air-Operated Clamp as Used to Hold Material to the Bed of the Drill Press. At Right, Close-Up of Air Cylinder Used to Operate Clamping Devices

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consists of a lever arrangement on one end of which is a small air cylinder, which is attached to the compressed air supply in the shop. The fulcrum of the lever is adjustable to three different positions on the vertical support. The pins of the fulcrum point are also adjustable on the main lever in several positions. The entire apparatus is fastened to the bed of the drill press and can be used in one position on many different kinds of jobs. The fulcrum pin is easily removable and can be changed quite easily.

This arrangement holds the work tightly and avoids the possibility of accidents often caused when mechanics attempt to hold the material by hand, not bothering to use the mechanical clamps and bolts that would otherwise be required.

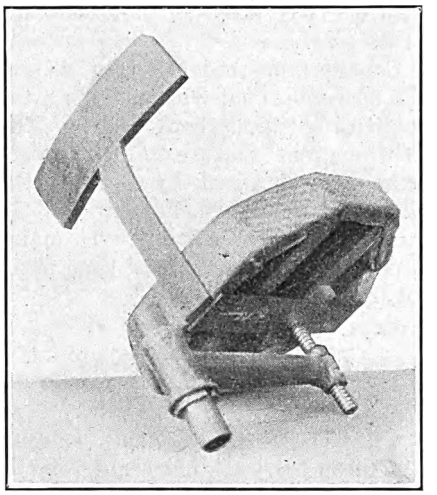
Another improvement which has been applied to all drill presses and lathes in the Detroit shop is a liquid circulating system for providing a supply of liquid at the cutting tool and material. The circulating system as applied to a drill press is shown in one of the illustrations.

A circulating pump is used to draw the liquid from a reservoir and force it through a flexible tube to the cutting tools. This pump is driven directly from the horizontal shaft of the pulley by adding the necessary pulleys and belt connection. A sheet iron tank 12 in. x 12 in. x 12 in. is provided on the floor to hold the liquid. After discharge at the tool through the flexible tube, the liquid follows grooves and openings in the drill press table and runs by gravity into a pan underneath which is 12 in. x 12 in. x 3 in. deep. From this catch pan the liquid flows by gravity into the supply tank and is then circulated again through the tube to the cutting tool.

This type of circulating system has been applied to all lathes and drill presses and has produced an enormous saving through the ability to speed up machinery so as to take larger and faster cuts.

Motorman's Seat Adjustable as to Height

IN ORDER to provide its motormen's seats so that they can be adjusted as to height in a manner similar to that of old type piano stools, the Erie Railways, Erie, Pa., has threaded the ⅞-in. swiveling rod which forms the pivot for the seat. A square thread is cut on it, three to the inch. The horizontal swiveling



Type of Motorman's Seat Arranged to Provide for Various Adjustments

rest is cut out fork shaped and a hexagonal nut is placed inside the opening. These hexagonal nuts are welded to the fork.

The swiveling arm at the rear of the seat allows for a back and forth adjustment to accommodate various motormen. A spring attachment keeps this in one position except when it is necessary to move to a new adjustment.

Cutting Worn-Out Tires from Wheels

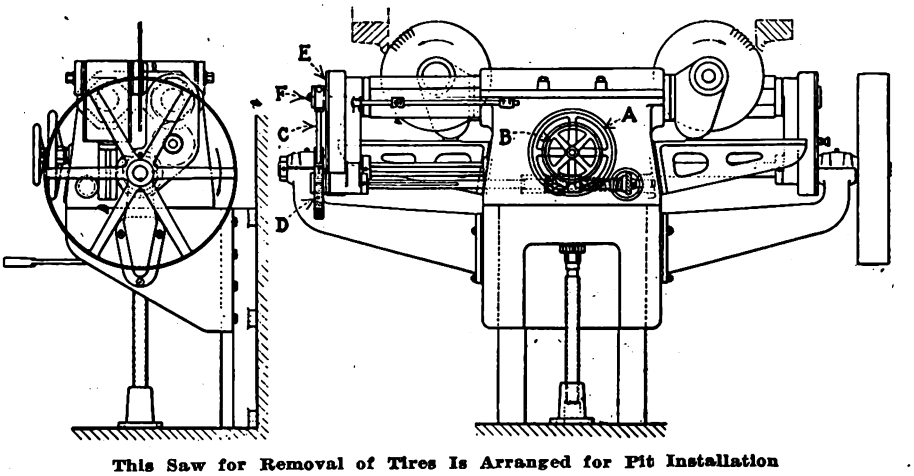
WORN-OUT tires may be removed from the wheels of electric cars or locomotives by a very effective and simple method described in the March 26 issue of *Verkehrstechnik*. The method consists of sawing the tire open at one point. The cut is not carried entirely through the tire, but approximately 3/32 in. of material is left at the bottom. This removes any danger of damaging the spider of the wheel. After the saw cut is made a wedge hammered into the cut completes the break and causes the tire to spring off.

A special machine has been developed for making these saw cuts and the work can be carried out on either one or both wheels of a pair at the same time. The machine is designed for pit installation, so that it can be installed in an average electric car shop. It can be driven directly by an individual motor or can be belted to an adjacent transmission shaft if one is available when installed in carhouse pits; however, individual drive is preferable.

To anchor a set of wheels during the cutting operations, grab hooks or tongs are used. Where wheels have openings these clamps may be placed through the wheels, and with solid wheels they are arranged to be applied to the axle. The machine used for cutting has a crosshead which carries the two saws. They are raised against the flanges of the wheels by means of a ratchet mechanism. When in proper position the mechanical feed is set, which automatically takes care of further advancing.

A spring-operated friction clutch is provided between the feeding ratchet wheel and its driving shaft. This stops further movement of the saws automatically if a hard spot in the tire is encountered, and feeding is not resumed until the saw overcomes the increased resistance. Double worm reduction is provided between the driving pulley and the saws.

Saws or milling cutters of 14 in. to 18 in. diameter can be used with the machine, and a small circulating pump is provided to deliver soapy water or other cutting fluid upon the saws. The circulating system also provides for return of the fluid to the collecting sump by gravity and it can then be recirculated through piping and flexible tubing to the cutting tools.



This Saw for Removal of Tires Is Arranged for Pit Installation

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New Equipment Available

Floodlight for Electric Railway Yards

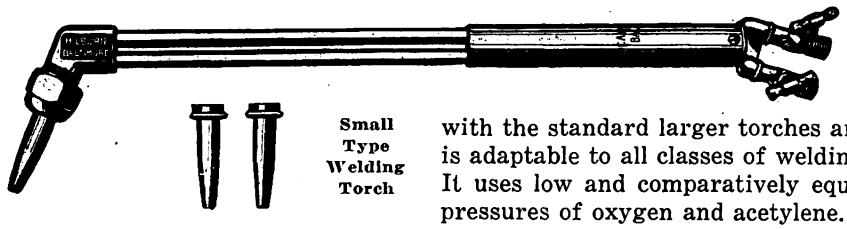
USE of a chromium plated reflecting surface, light weight and airtight construction are the outstanding characteristics of the new cast aluminum floodlight being manufactured by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This light is said to be particularly well adapted for use in railway yards and industrial plants.

The chromium plated surface of the reflector is an important achievement in lighting equipment as it lengthens the life of the reflector and eliminates the necessity for delicate care essential with other types of surface. High reflecting properties are possessed by the chromium plated surface and at the same time it is of a tool steel hardness. The manufacturers claim that it will neither tarnish nor break and is not subject to water vapor fumes. With this reflector it is possible to wipe off dust with a gritty waste without damage to the surface.

Considerable reduction in weight has been obtained without losing the qualities of sturdy construction. The weatherproof features of the floodlight are obtained by sealing the lamp and reflector chamber and in this way initial efficiency is maintained over long periods of time without large upkeep costs.

Light-Weight Gas Welding Torch

DEMANDS for a small welding torch for work not requiring the usual standard torch have led the Alexander Milburn Company, Baltimore, Md., to perfect the type J-Jr. torch. This is a sturdy, compact design giving a high degree of efficiency and economy. The torch uses the same tips as are supplied with the standard larger torches and is adaptable to all classes of welding. It uses low and comparatively equal pressures of oxygen and acetylene.



Small Type Welding Torch

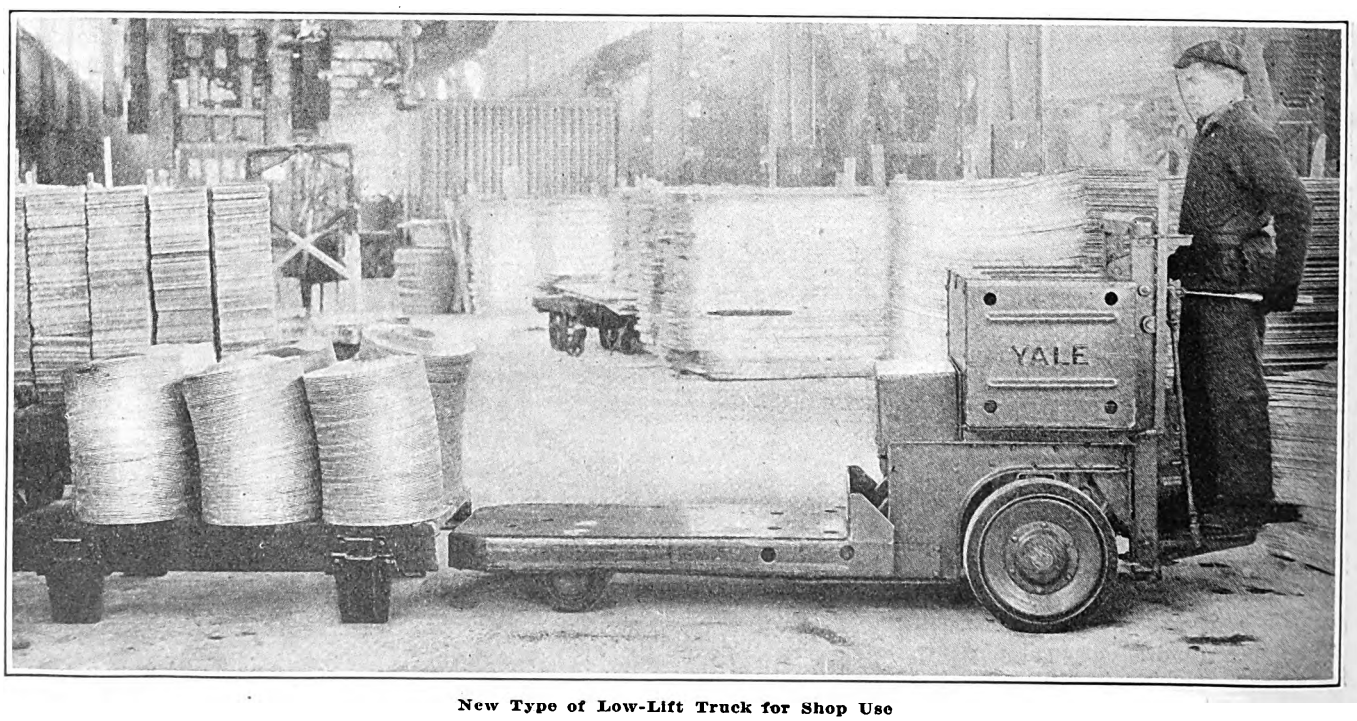
Due to its light weight, it does not tire the workman to operate it continuously. The supermixing of the gases through a standardized system of multiple mixing assures a complete intermixing of the gases and a uniform flame. The seats of the tips are flat, with annular grooves coinciding with those in the head, the gas passages entering through the annular grooves or rings which separate the gases. The construction of these seating surfaces allow lateral expansion of torch head and tip without distortion and the seats are very easily refaced.

The J-Jr. torch is adapted to gas supplied either from generators or compressed in tanks. It is made of bronze forgings and specially drawn stainless tubing. An angle of 67½ deg. in the head allows a natural position in operating the torch, utilizes the heat to best advantage and protects the operator's hands. The torch is 18 in. long, weighs 25 oz. and has three welding tips.

Elevating Platform Truck for Shop Use

DESIGNED to carry unusually heavy loads, a new elevating platform truck has been placed on the market by the Yale & Towne Manufacturing Company, Stamford, Conn. The truck is of a low-lift type, with features desirable for self-loading. It has a short turning radius. The machine itself being narrow, it is easy to drive in narrow aisles such as are encountered in electric railway shops. Hardened steel steering pivots with bronze bushings and the high-pressure lubrication system reduce friction and make steering easy when carrying full load.

The triple spur-gear elevating mechanism consists of the same unit as that used in the company's K-22 truck. The elevating platform is raised by two large eccentrics, mounted on the hoist unit shaft.



New Type of Low-Lift Truck for Shop Use

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Association News & Discussions

Using the Bus to Relieve Congestion*

Efficiency of Passenger Transportation in City Streets Can Be Increased by the Use of Common-Carrier Vehicles in Place of Private Automobiles and Taxicabs

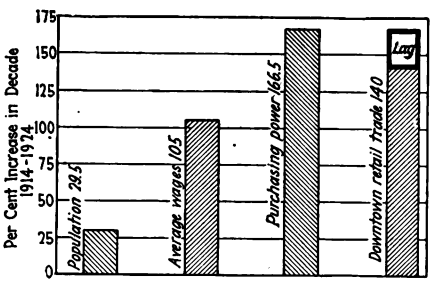
BY JOHN A. MILLER, JR.
Associate Editor ELECTRIC RAILWAY JOURNAL

MANY plans for the relief of traffic congestion are based on the general theory of providing more roadway area, to be used in exactly the same way that the existing street area is now used. Cutting through new thoroughfares, widening present roadways, arcading sidewalks, double-decking arterial routes and placing the electric railways underground are among the proposals made. Enormous expense would attend the execution of any of these plans, and it is extremely doubtful if permanent relief from traffic congestion would be attained. Experience has shown in a number of instances that new streets cut through to relieve overcrowding on older streets soon become congested themselves, without any marked diminution of traffic on the other streets. On the other hand, by the more intensive use of present streets a far larger volume of traffic could be moved through them without the necessity for huge expenditures on improvements.

The present general practice of using roadway space for the storage of private automobiles is in reality neither a convenience to the automobilist nor a benefit to the merchant. Elimination of parking in congested districts would greatly increase the roadway available for moving vehicles. Use of attractive common-carrier vehicles can be developed to handle a large part of the traffic now using single-passenger or two-passenger vehicles. A material reduction in congestion can thereby be effected without excessive cost. Movement of all traffic will be facilitated to a degree that will be advantageous to the users of public and private conveyances.

Contrary to a prevalent opinion, prohibition of parking in the congested districts is likely to aid business rather than injure it. After the enactment of no-parking ordinances in Pittsburgh retail trade in the downtown district showed an increase in comparision with that of the outlying commercial centers. In a large number of cases analysis would undoubtedly show that the volume of trade in downtown stores has not kept pace in recent years with the development of a community. As an example, let us consider the situation in a certain city of about 500,000 people, with some 250,000 more in the adjacent suburban territory. In 1924 the population of this entire district was very nearly 130 per cent of the 1914 figure. At the more recent date the average individual received wages which were approximately 205 per cent of those received in 1914. From these data we see that the total purchasing power of the district in 1924 was 266½ per cent of that existing before the war.

Investigation of the volume of business of a number of representative downtown retail stores in this particular city showed that in 1924 it was only some 240 per cent of that done ten years earlier. Thus it will be seen that the growth of retail trade in the downtown section lagged far behind the increase in the purchasing power. On the other hand, in the case of one particularly high-grade store, some 3 miles from the business center, the present volume of business is approximately 480 per cent of that done in 1914.



The Volume of Downtown Retail Trade Lags Behind Purchasing Power

A realization of the remarkable increase which has occurred in the outlying commercial centers during the decade may be had from a study of the locations of banks of deposit. In 1924 the number of such banks in the entire area was 49, compared with 37 in 1914. During these ten years, however, only one new bank was opened in the center of the city. All others were in the outlying districts. The zone from 1 to 2 miles from the center showed an increase of four, as did also the zone from 3 to 4 miles.

Figures of this kind do not show with mathematical accuracy the comparative growth of business in the city center and surburban areas. Nevertheless, a bank of deposit is rarely opened in a purely residential section, and its presence may fairly be taken to indicate the existence of a business community. The surprising increase which has occurred in the outlying sections illustrates clearly how business has sprung up there during the past ten years.

Downtown traffic congestion undoubtedly is the most important reason for this process of decentralization. Transportation in public conveyances has become relatively slow and subject to irritating delays. It is a task of considerable difficulty and some danger to drive a private automobile in the downtown streets. As a result, people do their buying near at home. This tendency will increase as congestion increases. Retail merchants, therefore, should favor rather than oppose the elimination of parking on important streets.

If parking of private automobiles in the public streets downtown is forbidden, a question arises as to what can be done with them. One answer might be to provide parking spaces in the centers of the blocks, which are usually not built upon, underneath some of the existing buildings, or in many storied garages. The number of automobiles which could be accommodated in this way is more or less limited, however, and the charges are likely to be rather high.

Establishment of parking spaces on the outskirts of the city and transportation of passengers downtown by public conveyance is a solution that is being tried in a number of cities. Several such parking spaces are operated by the Philadelphia Rapid Transit Company, which carries the automobilists from the outlying sections into the business district by rail. A number of other electric railway companies have undertaken similar schemes. In these cases the charge for parking includes transportation back and forth by street car. An arrangement of this kind not only solves the problem of where to store the private automobiles without wasting valuable roadway area, but it also promotes the efficiency of passenger transportation in the congested district by substituting one large vehicle for many small ones.

ECONOMIZING ROADWAY SPACE BY USE OF LARGE CAPACITY VEHICLES

Substitution of public transportation vehicles of fairly large carrying capacity for individual automobiles carrying on the average not more than two persons can be advantageously made in many instances. For example, de luxe bus service often will prove an entirely acceptable substitute for the use of numerous private automobiles. In Washington, D. C., the Capital Traction Company operates luxurious buses from the high-class Chevy Chase residential district to the shopping district of the city. Fares are higher than on the street cars because of the superior facilities provided. The net transportation expense to the Chevy Chase resident by bus, however, is smaller than when he uses his own automobile, and with existing conditions of congestion the greater convenience of the bus service is marked. This service has proved very popular.

Similar transportation facilities are

*Abstract of a paper published in the proceedings of the American Society of Civil Engineers for May, 1926, page 827, to be presented at a meeting at New York, June 2.

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AVERAGE LOADING OF PRIVATE AUTOMOBILES AS SHOWN BY RECENT TRANSPORTATION SURVEYS

City	Duration		Vehicles	Passengers	Passenger per Vehicle
Washington, D. C...	April 30 (in)	15 hr.	100,284	171,051	1.71
	April 30 (out)	15 hr.	92,666	154,394	0.67
	June 4 (in)	15 hr.	114,047	223,000	1.96
	June 4 (out)	15 hr.	112,957	218,988	1.94
Chicago, Ill.....	June 4	1 hr.	2,600	4,700	1.81
Atlanta, Ga.....	June 4	All day	27,540	49,600	1.8
Los Angeles, Cal....	June 4	11 hr.	261,974	393,322	0.50
Detroit, Mich.....	June 4	1 hr.	12,180	21,200	1.74

provided between the Edgewater Beach Hotel and the shopping district of Chicago. Although intended primarily for the guests of the hotel, patronage of this de luxe bus service is not confined to them, but includes residents of the entire fashionable neighborhood in that vicinity. Not only are the buses a cheaper and more convenient mode of transportation than private automobiles or taxicabs would be under these circumstances, but they have come to be considered a more distinguished mode. In other words, it gives one greater prestige to be seen alighting downtown from the 35-cent Edgewater Beach bus than from a taxicab at twice that fare.

More general use of collective transportation vehicles of this kind would go far toward increasing the efficiency with which the available street space is used. Traffic counts made in various cities show that private automobiles carry an average of less than two passengers per vehicle, as shown in the acompanying table. This is equivalent to about 30 sq.ft. or more of street area per passenger. A bus of ordinary size can accommodate comfortably at least twenty persons. Assuming that it would average only three-quarters of a full load, fifteen people would be carried. Under these circumstances about 16 sq.ft. of street area would be required per passenger. Inasmuch as the speed of the bus and the private automobile would be approximately the same in the congested district, the use of the former to replace the latter would double the efficiency with which the existing street area is utilized.

Theoretically an even greater increase in efficiency might be attained by the substitution of the electric rail car, requiring only 3.5 sq.ft. of street space per passenger carried, for the private automobile. In actual practice, however, it is found that the character of the service rendered by these two modes of transportation is so different that it is impracticable to try to replace the automobile by the trolley. Well-operated bus service with commodious vehicles, on the other hand, can be made an entirely acceptable substitute for the use of private automobiles.

Most wasteful of all vehicles used in passenger transportation is the taxicab. Investigations made by the writer at various locations in New York City indicate that the average load is only 0.83 passenger. As this vehicle occupies some 64 sq.ft. of street area, the space required per passenger carried is about 80 sq.ft. When it is realized that there are more than 17,000 taxicabs in New York City, and correspondingly large numbers in other cities, the importance of this cause of congestion is evident.

Surprisingly enough, the greater part of the taxicab movements follow definite routes. In the transportation survey of Washington, D. C., by McClellan & Junkersfeld movements of 324 taxicabs operated by four taxicab companies were analyzed for one weekday. During this typical day 7,924 taxicab movements were studied. Of this number some 5,000 movements were made along only 33 main routes. The three heaviest routes were between the Union Station and the business district, 600 trips; between the Mount Pleasant residential district and the business district, 400 trips, and between Georgetown and the business district, 350 trips.

From these figures we see that in Washington about five-eighths of the taxicab movements are along certain definite routes. Substantially the same condition no doubt prevails in other cities. Why not replace these taxicab movements along definite routes by bus service requiring 16 ft. of street area per passenger carried instead of 80?

Obviously it would not be feasible to try to replace entirely the taxicab by the bus, any more than it would be to try to replace altogether the private automobile. It is clear, however, that so much of both of these kinds of traffic flow along a comparatively few main routes that a real opportunity exists to effect an important improvement in passenger transportation in congested districts by thus using one vehicle of high-carrying efficiency to perform the work now being done by numerous smaller vehicles of low-carrying efficiency.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 11-13 — Chamber of Commerce of the United States, annual meeting, Washington, D. C.

May 13—Central Electric Railway Master Mechanics' Association, Orlando Hotel, Decatur, Ill.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 25-26 — New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13 — Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Birney Club Hears About Bus Brakes

AN ILLUSTRATED talk on the subject of brakes for buses and motor trucks was delivered at the April meeting of the Birney Club held at the Missouri Athletic Association, St. Louis. The attendance totaled 57, of whom 33 were members and 24 were guests. H. D. Hukill, chief of the automotive division Westinghouse Air Brake Company, was the speaker of the evening.

Greater safety of operation is possible with the air brake, he said, for four reasons: First, there is sufficient fiexibility to permit the precise regulation of braking force demanded by the varying conditions of grade, load and road surface; second, the same force is automatically applied to each wheel and equal retardation developed on both sides of the bus, thereby minimizing the danger of skidding; third, it relieves the driver of all fatigue incident to braking, and fourth, it permits the use of metal brakelining, which produces the same effect under all conditions.

The special safety feature designed by Mr. Birney for use on buses may be attached to any standard chassis without in any way disturbing the operation of the original manual braking equipment, he said. One of the early installations of Westinghouse air brakes with metal shoes to bus fleets was that of the Key System Transit Company, where it was found that the total cost of brake maintenance was only 50 cents per 1,000 miles as compared with $3.50 per 1,000 miles for manually-operated fabric brakes in the same service.

U. S. Chamber of Commerce to Discuss City Traffic Problem

CITY traffic will be one of the important subjects discussed at the fourteenth annual meeting of the Chamber of Commerce of the United States to be held in Washington, D. C., May 11 to 13.

A. L. Humphrey, president Westinghouse Air Brake Company, will preside. Elliot H. Goodwin, resident vice-president of the National Chamber, will set forth the main points in the program recently advanced by the Conference on Street and Highway Safety for dealing with the traffic problem.

George M. Graham, vice-president Chandler Motor Car Company, will discuss congestion and accident hazards from the standpoint of the automobile industry, paying particular attention to the problem in the cities.

Frank R. Coates, president American Electric Railway Association, will talk on "Co-ordination of Transportation as a Factor in the Solution of the Traffic Problem."

The relation of the steam railways to the city traffic problem will be dealt with by R. H. Aishton, president American Railway Association.

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The News of the Industry

Complications Continue in Columbia

Before many weeks have passed it is more than probable that the clang of the trolley gong, so long a familiar sound in Columbia, the capital of South Carolina, will be replaced by the bark of the bus, for the South Carolina State Highway Commission has given a permit to the Carolina Transit Company to operate buses on streets which they have heretofore not touched.

Months ago, when citizens petitioned that the Columbia Railway, Gas & Electric Company, which operates the railway, be allowed to take up a short stretch of track, it was made known that the railway was losing money—from $6,000 to $8,000 monthly—and that it was only a question of time when operation would cease. The Carolina Transit Company was then organized and some time later was authorized to operate buses in sections not served by the street cars. Jitneys, carrying passengers at 10 cents a head, continued to operate in direct competition with street cars.

In an effort to save the street cars a "zone" system was put into effect in the hope that by this system railway revenues would be increased. But losses increased under this system instead, and now buses carrying 29 passengers each have been allowed to operate on streets served by the railway.

F. K. Woodring, general manager of the Broad River Power Company, which controls the Columbia Railway, Gas & Electric Company, has entered no protest to the operation of the buses. Street car fares may have to be raised. They are now 5 cents in each zone.

The jitneys, mostly cars of a light and popular make, carry only white passengers. The buses and street cars carry whites and negroes.

Meanwhile, Columbia has three systems of transportation—buses, street cars and jitneys. Columbia is a city of about 40,000 people. It cannot support three different transportation systems.

Another Town Assumes Paving Costs

Following a conference between the representatives of the Detroit United Railway and the president of the village of Ecrose, Mich., trustees of the village accepted the offer of the railway to lay double track through the village. It is planned to start work at once.

It is understood that under the agreement the D.U.R. will lay the ties, rails and ballast, and that the village will assume the responsibility for paving between tracks. The terms of the agreement indicate that the estimated cost to the D.U.R. will be $64,000 and that the village's share will be $40,000.

The terms of the agreement were arranged by the Security Trust Company and W. C. Dunbar, receivers for the D.U.R., and A. L. Drum, operating manager for the receivers. It was reported that the company lost approximately $173,000 on the down-river lines, including Ecrose, during the year 1925. It is further reported that the loss is in excess of the deficit suffered by the Peoples Motor Coach Company, a subsidiary, which operates coaches over various lines, including the down-river towns.

Strike in Akron

Men on Akron-Canton-Massillon System and on Interurban Lines Walk Out—The Company Is Fast Restoring Normal Service

MOTORMEN and conductors of the Northern Ohio Power & Light Company operating city systems in Akron, Canton and Massillon and interurban lines connecting Cleveland and Uhrichsville, Akron, Alliance, Warren and Wadsworth refused to take out cars Sunday morning, May 2, following failure to reach an agreement on working conditions and wages. The strike was called by Edward McMorrow, representing the Amalgamated, without notifying the company or the public.

Disagreement came upon two important points:

1. The union demanded a clause in the contract which would require the company to take away the seniority rights of any employee who refused to pay his dues to the carmen's union.
2. The union insisted upon the following wage scale: One-man car operators, first three months 80 cents an hour; next nine months, 82 cents an hour; after one year, 85 cents an hour. Two-men cars, 65 cents first three months, 67 cents next nine months, 70 cents after first year. Suburban operators 1 cent an hour more than these scales. Interurban operators 5 cents more than these scales.

The union representatives also insisted that the word "employee" be written into the contract, thus covering busmen. At the last moment this demand was withdrawn. The union also insisted upon one contract covering the entire property. Heretofore four contracts have existed—one between Akron city trainmen, two with the interurban divisions and one with the Canton-Massillon city divisions.

The company refused the demands of the union. It offered to go ahead another year under the old contract.

Cars were operated by the company Sunday with employees who had dropped out of the union. Most of the city lines were filled on the Sunday schedule basis. On Monday more employees joined in operating cars and on Tuesday all runs were filled by former employees, except Wooster and Bowery.

In Canton approximately 50 per cent of the day service was operating Tuesday. No effort was made the early part of the week to operate cars in Massillon, and no interurban cars are operating. Freight is being handled by truck.

Strikers are picketing all important points in Akron, Cuyahoga Falls and Canton. The company is operating 140 buses in Akron, and this service, coupled with the car service which it has been able to establish, is giving general satisfaction, according to statements made by the big rubber concerns.

Authorities are guarding against outbreaks. Old-time methods of visiting the homes of men who are working for the purpose of getting them to join the strikers have failed. No strike breakers are being imported, but the company began Wednesday to hire men in the regular way. Inexperienced men are being put through training, while experienced men with good records are given runs.

The bus drivers are not a part of the Amalgamated Association. They have an organization of their own and have refused to join with the carmen who are on strike. Additional buses are being received by the company almost daily and are being pressed into service. Public sentiment is with the company.

In a statement issued Tuesday the company said:

> Service will be increased steadily day by day until complete service is established. In rehiring men the company plans to use extreme care. Men accepted for transportation work must come well recommended in filing applications. Preference will be given former employees with good records. Inexperienced men must go through the regular training school and pass examination before being accepted for train service. It is for this reason we ask the car riding public to be patient. Good transportation can only be built up slowly. We intend to build it to a point where it is even better than it was before the strike.
>
> We are informed by loyal trainmen who are working that efforts had been made to intimidate them. Some report that their homes have been visited and attempts made to frighten their families. Fortunately, this intimidation has had no effect. Complaint comes from car riders that they are being annoyed by strike pickets who urged them not to ride the cars. We requested patrons to ignore these pickets.
>
> All cars are manned by men who have been in our employ for some time. The public will find them courteously endeavoring to give good service. They will continue to do so even under the present trying circumstances.
>
> For the present no street cars will be operated after dark. The company does not desire needlessly to expose trainmen who voluntarily work to the limit to aid in supplying service.

Seniority rights for old employees not working ended at noon Tuesday, May 4. The men were notified that they would be accepted only as new employees in the future. The company has absolutely refused to deal any fur-

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ther with the Amalgamated Association. This stand is apparently meeting the approval of the public, which has suffered great inconvenience in the past due to the strikes called by representatives of the National Association.

Interurban buses operated by the company are handling traffic between Akron and Cleveland, Akron and Canton, Canton and Massillon, Akron and Wadsworth. Arrangements have been made with the Pennsylvania-Ohio Electric Company to handle passengers by bus from Akron to Kent, Ravenna and Warren.

The present wage scale of the company for two-man city cars operators is 48, 50 and 53 cents an hour according to length of service. One-man car operators receive 4 cents an hour more than this scale. Interurban operators receive 5 cents an hour more than this scale and suburban operators 1 cent an hour more than this scale.

A. C. Blinn, vice-president and general manager of the company, on Wednesday issued the following statement after refusing to meet with Amalagamated representatives:

> This company believes car riders on its system have suffered too greatly from transportation interruptions because of the domination of its trainmen by officials of the Amalgamated Association.
>
> As the citizens of this territory know, the trainmen on this system have been called on a strike many times. Often the public has been put to great inconvenience by these strikes.
>
> The company has decided that it will no longer tolerate this domination, and, therefore, will have no future dealings with the Amalgamated Association or its representatives.
>
> We believe the public—and particularly those who are dependent upon the cars—will agree with us that the time has come to end this intolerable domination.

Cars were operating on May 7 on every line of the Akron city system and out of the rush-hour peak of 82 runs, 73 runs were made. The normal basic number required is 65. Thirteen trailers and 219 buses are in use for the emergency. Of the latter number 58 are taking care of interurban travel between Canton and Cleveland. The company is not attempting railway service at night, and it probably will be some time before it does. In the meantime buses are operating at night under six and ten minute headways. The tense condition is somewhat alleviated by the acquisition of new employees and the return of many old ones to service. The situation throughout is quiet. The backbone of the strike appears to be broken.

Electrical Experts Win Confidence at Melbourne

As preoccupied as W. H. Sawyer certainly must be with his general inquiry into the status and scope of the Electricity Commission of Victoria, Australia, and into the working of the state electricity commission acts, he has found time to endear himself to the people of Melbourne. Newspaper comment refers to his intelligent curiosity, his brisk friendliness and one opinion was ventured to the effect that "this sort of man can be more useful to Victoria than a dozen vain and rude ceremonialists." He sees much to be commended in Melbourne and Melbourne instinctively responds to him and the country he represents. By virtue of his being appointed a royal commissioner Mr. Sawyer is empowered to administer oaths, compel the attendance of witnesses and call for documents.

Mr. Sawyer, president of the East St. Louis & Suburban Railway, East St. Louis, Ill., and Herbert W. Eales of the Union Electric Light & Power Company, St. Louis, Mo., left in January for Australia to direct an extensive survey into electrical development for the Victorian government.

New Commission Members in New York Take Office

John F. Gilchrist, Leon G. Godley and former State Senator Charles C. Lockwood took office on May 1 as Transit Commissioners for New York City, succeeding George McAneny, LeRoy T. Harkness and General John F. O'Ryan.

Mr. Gilchrist, chairman of the commission by the Governor's appointment, speaking for himself and his colleagues, said he did not think it wise on assuming office to make any extravagant promises concerning what the commission proposed to do. He said:

> We are new to the problems we will have to consider and must take time to familiarize ourselves with details. The new commission will try to act and not talk.

John Hays Hammond Honored

Government officials, engineers, university representatives and prominent personages here and abroad unanimously gave tribute to John Hays Hammond, leading engineer, statesman and capitalist, on the occasion of his 71st birthday, at a dinner at the Waldorf-Astoria on May 3. Besides being a mining engineer, Mr. Hammond was one of the builders of the Cape electric trams in South Africa. With Henry A. Butters he organized the company that developed the present electrified system in Geneva, Switzerland. They also electrified the lines in Mexico City. Hailed as an internationalist, a broad thinker, a great soldier of fortune, the spirit of metalism, Mr. Hammond listened to a résumé of his career, which has been a source of inspiration for many other dreamers. It was no wonder that when he rose he said that he was overcome by the demonstration in his honor. It was the value of friendship which meant most in life—which he regarded as an opportunity to play a bad hand well. Congratulations were sent by President Coolidge, and Chief Justice Taft expressed an admiration based on 50 years of close association.

On the committee of arrangements were many prominent citizens, among them Chauncey Depew, Coleman Du Pont, Charles Dana Gibson, James H. McGraw, J. E. Spurr and William Howard Taft. All the testimonials expressing good wishes to Mr. Hammond are to be engrossed and bound in several volumes.

Seattle Men Seek Pension System

Railway men of the Seattle Municipal Railway, Seattle, Wash., are planning to present a bill to the next Legislature seeking establishment of a pension system similar to that applying to firemen and policemen. Under the present method, membership in the relief association is not compulsory. Under the former private operation of the railway lines by the Puget Sound Power & Light Company membership in the relief organization was compulsory.

The system cannot be established so as to include all the railway men without an enabling act by the Legislature, the men point out. Under the plan, however, they hope to have established a sick and injured benefit fund, a pension for retirement after a specified benefit. By including all employees of the railway in such a scheme, the men say, an adequate fund could be established.

Review of Commission's Attitude on Taxi Purchase

Chairman Ainey and Commissioners Benn and Shelby signed the document setting forth the findings of the commission in favor of the purchase of the stock of the Yellow Cab Company by the Philadelphia Rapid Transit Company, but Commissioner Martin rendered a minority report. The majority opinion declares that taxicab riders are potential car riders and that the railway has been forced to operate several unprofitable lines as a result of the competition set up in this fashion. Continuing, the commission states:

> The co-ordination of the street car and taxicab service will increase the revenue of the railway and aid it in bearing the burden of operating the city's non-paying high-speed lines; will result in considerable reduction in overhead expenses of the cab company, and will provide a more adequate and convenient distribution of the taxicab service and other transportation facilities.

Commissioner Martin bases his dissenting opinion upon two grounds. The first of these is as follows:

> The ultimate purpose is to create a monopoly of all forms of local transportation in the city, which is not conductive to the public welfare.

The second objection is found in those provisions of the contract which require that the fares and income of the Yellow Cab Company shall be included in any investigation or readjustment of the fares and income of the Philadelphia Rapid Transit Company. Commissioner Martin said:

> The trolley car system and the cab system of transportation is each a separate entity and should stand on its own feet. No sound economic reason is suggested why each separate class of riders should not pay its own bills. There is no reason why street railway fares should be increased to make up an operating deficit of the cab company, nor is there any reason why the taxicab rider should pay an added rate to help out a railway.

No steps for the immediate securing of the remaining taxicab companies in Philadelphia are contemplated by P. R. T. at the present time. Under provisions of the commission's majority order the railway will be required to make the Yellow Cab Company, now incorporated under the laws of Delaware, a Pennsylvania corporation within six months. It was further specified:

> Neither the purchase price nor any valuation filed in the proceedings shall be binding upon the commission in any further proceeding requiring determination by the commission of the value of the property and assets of either the Philadelphia Rapid Transit Company or the Yellow Cab Company for rate-making purposes.

Approval of the purchase by the commission was noted in the ELECTRIC RAILWAY JOURNAL for April 24, page 784.

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News Notes

Increase in Pay Asked by Chicago Surface Men.—Employees of the Chicago Surface Lines—approximately 14,000 conductors and motormen—voted on May 3 to ask for an increase in pay of 5 cents an hour and for the establishment at the expense of the company of a $1,000 death benefit and a weekly sick benefit of $20. These demands they will seek to put into a new wage agreement to become effective on June 1.

Increased Fares May Go Before Voters.—It is likely that the question of increased fares and of changed paving requirements will be voted on at a special election to be held in the city of Ironwood. The Lake Superior District Power Company has requested permission to increase fares in Ironwood, Mich., from 5 cents to 8 cents for adults, with adults either having the choice of seven tickets for 50 cents or a 50-ride ticket book, good for 30 consecutive days, for $2.50. School children will be allowed to ride for 5 cents or seven tickets for 25 cents. Release from paving charges is also sought.

Portland Pay Car Robbed.—The pay car of the Portland Electric Power Company, Portland, Ore., was held up at 9 o'clock on Sunday morning, April 18, and approximately $14,000 in cash was obtained by the bandits. The Portland Electric Power Company has posted a reward of $1,000 for the capture of the bandits. The robbery is one of the most daring that has occurred in this city in many years.

Another Step in Franchise Negotiations.—A meeting of the board of directors of the Virginia Electric & Power Company, Richmond, Va., was recently called to act upon formal matters in connection with the company's bid on the new blanket franchise. An agreement to surrender the present franchise, a step necessary before bidding can be made upon the new franchise, was signed and will be presented to the streets committee of the Richmond City Council at its next meeting, so that action on the franchise may be expedited. The agreement also covers the provision for the sale of the power company's traction properties in the remote event that another company should be the successful bidder for the new franchise.

Parking for Philadelphia Shoppers.—A co-operative parking plan evolved by and for the benefit of the Chestnut Street Association in Philadelphia has been put into effect. It provides free parking for patrons of more than 25 stores represented in the association, and utilizes 40 garages in the locality between the Delaware and the Schuylkill Rivers and Pine and Vine Streets. In operation the plan is relatively simple. The driver of the automobile goes to the garage most convenient in the prescribed area which is using the plan. Upon leaving the car at this garage, the patron receives a claim check. The shopper then is free to go where he will and to remain as long as he wishes. At the stores where the plan is being used, the claim check is presented upon making a purchase. The store gives the patron a card, properly stamped and dated, which is presented to the garage owner or employee when the car is to be taken out. This card pays for the storage during the shopping period.

Children Will Show Ideas on Safety.—The Safety Poster Contest, opened in Atlanta's public schools on April 15, and held under the auspices of the Atlanta Safety Council, will continue until May 15. Under rules announced by the council, the contest is open to students of the fourth, fifth and sixth grades. Two prizes are offered for the best posters in each grade, a first prize of $5 and a second prize of $2.50. In addition, a prize of $5 will go to the Parent-Teacher Association of the school submitting the largest number of posters. The contest is held primarily to impress the youngsters with the importance of safety; to influence them to use every precaution to prevent accidents, and to give them an opportunity, through deep study of the subject, to display their originality in the drawings. In last year's contest more than 20,000 posters were drawn.

Foreign News

Transportation Facilities Disrupted in England

Transportation in and around London, England, is practically crippled owing to the general strike. Thousands are walking to work, while others jam the few trams in operation, the many buses and the private automobiles rushed into service. Even horse vehicles have been resurrected.

Transit facilities are improving, however. The central tube in London was running on skeleton schedule on May 5 and volunteers have come forward sufficient in number to warrant the management in announcing that service on most lines will be a reality in the near future. Trains are running after a fashion between most of the important cities and with the promise of more volunteer crews better service is expected.

Conditions appear darker in some localities than in others. In Manchester the tramway employees are solid for continuance of the strike. There transportation to nearby towns is entirely by buses and motor cars. On the other hand, in Portsmouth 50 per cent of the tramway employees who were on strike on May 4 returned to work the following morning when it was announced they would be dismissed if they failed to report for duty.

Manchester Tramway Developments.—Tramway extensions costing approximately £120,000 are now being made in Manchester, England. About £20,000 will be spent on bus purchases.

Electric Trains to Operate Over the Andes.—Work is now in progress on the electrification of the railroad across the Andes Mountains in South America between Argentina and Chile. Electrification of the Chilean section as far as Caracoles, on the Argentine border, is now under way. The cost of this project is estimated at $3,000,000.

Progress in Electrification in Austria.—Electrification of the Austrian Federal Railways is progressing as rapidly as funds are released from the balance of the League of Nations credits set aside for investment purposes. In addition to the 56 electric locomotives ordered last year, most of which are now in operation, 50 more have been ordered and delivery will be made progressively until the end of 1927. The new locomotives have axle loads of 16 tons, the former being adapted to only 14.5 tons. The roadbed is unable to support the heavier type locomotives, but it is planned to reinforce the principal portions of the main lines at a future date, particularly the Vienna-Salzburg line, in order to permit the use of a stronger type locomotive.

New Electric Locomotives in Italy.—Ten new electric locomotives have recently been ordered by the Italian State Railway authorities from the Breda Engineering Works of Milan, as a result of trials on the Rome-Tivoli-Avezzano line. Each engine has a wheelbase of 38 ft. and is fitted with two electric motors, the drive being through gearing and coupling rods to two of the axles. The machine is equipped with a transfer which steps down the 45-cycle current from the 10,000-volt trolley potential to 1,600 volts. The motors can be run either in series or parallel.

One-Way Traffic on Strand.—Part of the Strand in London, one of the world's most crowded streets, will attempt to solve its traffic problem by operating one-way traffic. No vehicles may run on the Strand beginning at Trafalgar Square. They must detour and enter it above Charing Cross station.

Electrification in India.—Calcutta and Madras are following the example of Bombay in promoting schemes of suburban electrification. Areas requiring the most urgent development by means of railway extension, according to the administration's report of 1924-25, are Burma, South India and the coal field area in Bihar and the central provinces.

Railway Superseded by Bus in Liverpool.—Bus service has taken the place of the Waterloo & Crosby Tramways, a 3-mile line on the outskirts of Liverpool, England, following the abandonment of the tramway lines. Top-covered double-deck buses will be operated along this route by a local bus company. When the lease expired for operating the tramways it was proposed that the city of Liverpool should buy the undertaking, but the plan referred to previously did not mature.

British Tramways Association.—The annual congress of Tramways and Light Railways Association will be held at Torquay, England, June 23-25.

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Recent Bus Developments

307 Miles of Route in Penn-Ohio Operation

Constant expansion of the bus lines of the Penn-Ohio System, Youngstown, Ohio, has placed that company in the forefront among the railways as a user of the bus. The largest expansion has been that just recently announced in the acquisition of the property and routes of the Cleveland, Warren, Youngstown Stage Company. This added 127 miles to the Penn-Ohio system's routes and eighteen coaches to its fleet, bringing the total number of interurban coaches to 45.

Daily the regular coaches of the system traverse 5,758 miles and extra service and trippers on Saturdays and other big days often run this mileage to more than 6,000. Throughout the "home territory" of the Mahoning and Shenango valleys the bus lines extend and then northwest to Cleveland, west to Akron and northeast to Greenville, Conneaut Lake and Meadville.

Immediately after taking over the operation of the lines the opportunity to give extraordinary service was developed by arranging to take people from Youngstown, Girard, Niles and Warren direct to the Cleveland auditorium for the grand opera performances. Furthermore, seats for the opera were reserved at local ticket offices of the Penn-Ohio for persons desiring this service.

Plans are making for similar service to those desiring to go to ball games in Cleveland and also for those going from towns on the system to Cleveland to take the steamer for lake points.

The company entered the bus field on Aug. 1, 1922, with a service between Youngstown and Warren with a type of equipment that had been specially designed. The coach system now embraces 307 miles of routes.

Receiver Reports Results of Kansas City Bus Operation

The Kansas City Railways, Kansas City, Mo., sustained a deficit of $159,174 in the operation of its bus lines since the service was started last September.

The loss from September to Dec. 31 was $87,852 and from Jan. 1 to March 31, $71,322. Included in the deficit are the upkeep and maintenance of the buses, expenses for trimming trees along bus routes and other miscellaneous factors.

Francis M. Wilson, one of the receivers of the company, said:

> There is no move on to increase fares nor will there be. To increase fares would be both unprofitable and highly deplorable. The company must operate on the present fare, both for street cars and buses.

Mr. Wilson said he believed a saving could be effected by the intensive use of the double-deckers for the rush-hour period.

In making the figures public, Mr. Wilson emphasized that the reorganization group which is to take over the company at the termination of the receivership entertains no ideas of curtailing the bus service. He said:

> On the other hand, the new owners are convinced the service must be increased and Kansas City must be kept at the very front as a bus service city.

Detroit Preparing to Act

Will Exercise Power to Regulate Under Recent Court Decision — Bus Company and City Co-operate

Jitneys are being operated over the streets of Detroit, Mich., under the same regulations as before the decision was rendered by the Michigan State Supreme Court in which it reversed the finding of the Wayne County Circuit Court and upheld the validity of the Detroit ordinance regulating jitney traffic on Detroit streets. The jitney drivers have 40 days from the date of the decision in which to file a petition for a rehearing in the case.

Conferences have been held in which the Mayor, officials of the Department of Street Railways, the Rapid Transit Commission, the Police Department and the Corporation Counsel have participated, but the new regulatory ordinance planned to include jitneys, buses and taxis has not been framed by the Corporation Counsel.

Meanwhile the Highland Park Common Council has amended its city ordinances regulating jitney transportation, increasing the annual fee for jitney licenses from $15 to $25 and placing the jitney drivers under the regulatory control of the Highland Park police. Highland Park is a separate municipality surrounded by the city of Detroit, and the jitney drivers operating the Woodward Avenue route from downtown Detroit run their jitneys into or through Highland Park.

Principles which will govern future relations between the city of Detroit and the Detroit Motor Bus Company were drawn up at a recent meeting attended by representatives of the Rapid Transit Commission, the Street Railway Commission and the Detroit Motor Bus Company. Other meetings are to be held.

The representatives intend to determine the nature of all conflicts between the D.S.R. and the bus company with relation to their effect on service and the possible elimination of interference between the two systems. Also that in regard to the future situation in the city the committee agreed on the desirability of having facilities in strong hands, decentralized as to financial obligation but co-ordinated in service so as to feed to each other and reduce total investment by the avoidance of duplication. This is understood to be preliminary to the acquisition of the bus lines by the city at such a time as it completes its own trunk line system of rapid transit. It was reported that President Evans of the bus company stated that in planning expansion his company would be governed by the future needs of the city.

Competition Not Countenanced

A certificate for the operation of a bus line between Canandaigua and Geneva, via Algonquin and Flint, has been granted by the Public Service Commission. The certificate provides that the petitioners shall carry no through passengers between Canandaigua and Geneva and shall carry no local passengers in the city of Canandaigua in competition with the line of the New York State Railways in that city. The petitioners have operated between Canandaigua and Geneva for five years. The memorandum of the commission accompanying the order points out that while trolley service is probably adequate, there is need for service to accommodate the local traffic along the Turnpike Road.

More Bus Lines for Public Service

Purchase of the Rutherford, East Rutherford and Hackensack Bus Lines, Inc., and the Elizabeth-Linden and Rahway Bus Lines, Inc., by the Public Service Transportation Company, Newark, N. J., was announced by that concern on May 5. The Rutherford line operates between Rutherford and Hackensack and has permits for four buses. The other line runs between Elizabeth and Rahway and has fourteen buses.

Bus Extension in Rochester Planned

Further expansion of the bus system of the New York State Railways in Rochester, N. Y., is indicated by petitions for three new routes filed with the Common Council and a fourth with the State Public Service Commission. The applications were made by the Rochester Railways Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways.

At a hearing in Rochester before Commissioner Van Voorhis of the state body no opposition was expressed to a proposed line to skirt the northern boundary of the city and provide service to the suburb of Irondequoit on Lake Ontario. Three street car lines, the St. Paul, Clifford and Sea Breeze, would be connected with the proposed bus line. Service will be hourly and three zone fares established, with the highest fare set at 30 cents. Transfers to all trolley lines would be issued.

The three other lines, all in the city, are: Extension of the Emerson Street bus line from Lexington Avenue and Lee Road to the city line; from Lyell Avenue and Glide Street to the city line on the west side, and from Lake Avenue and Latta Road through Latta Road to city line on the north side.

All of these routes would serve newly developed outlying territory and all would act as feeders to trolley lines.

Minnesota Buses to Be Rerouted

Better routings of the interurban buses of the Twin City Motor Bus Company are to go into effect between Minneapolis and St. Paul, Minn., following a decision by the Minnesota Railroad and Warehouse Commission. This decision gives this subsidiary of

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the Twin City Rapid Transit Company a present monopoly of the intercity bus service. The change affects the loops in both cities. T. Julian McGill, vice-president, will confer with retail merchants preliminary to a petition before the commission to operate a fleet of twelve-passenger buses on Nicollet and Hennepin Avenue out to Lynnhurst, which is a district south from Fortieth Street. This auxiliary service is planned to begin as soon as the new terminal building is completed, about July 15.

Further Expansion in Vancouver

The British Columbia Rapid Transit Company, Vancouver, B. C., a subsidiary of the British Columbia Electric Railway, has opened a new motor coach route between Vancouver and Chilliwack, a distance of 76 miles. Both freight and passengers will be carried.

The passenger route was purchased from G. L. Hamre, and the freight business from H. A. Thornton, both of whom have been retained in the company's employ. These routes formerly extended only to Abbotsford, but with the opening of a new road to Chilliwack, 20 miles farther, coaches now operate the entire distance.

Four trips daily each way are made by the passenger coaches and two trips by the freight trucks. Passenger coaches terminate at New Westminster, 12 miles from Vancouver, at which point passengers are transferred to other coaches of the company. Two Fageol coaches have been ordered and will replace the old acquired equipment.

The British Columbia Electric Railway operates an interurban railway between Vancouver and Chilliwack carrying both freight and passengers. The new service will cater to less than carload lot freight, leaving the through shipments to the railway.

Boston-Providence Service by New Haven

The Department of Public Utilties of Massachusetts on May 1 approved the application of the New York, New Haven & Hartford Railroad and the New England Transportation Company which is controlled by the railroad, to operate a bus line between Boston and Providence. The line would be operated to provide bus service to Boston for residents of Walpole, Wrentham, Plainville, North Attleboro and Attleboro. Local passengers between Boston and Norwood would not be carried on this line.

Northwestern Indiana Bus Service Under Way

Operation of 25 bus lines in northwestern Indiana, radiating from Gary, Hammond and Michigan City, has been formally started by the Shore Line Motor Coach Company. These coach lines were merged under the new company following the granting of a petition by the Indiana Public Service Commission. All intercity lines formerly operated by the Gary Railways, Farina's Bus Line and B. P. Shearon are included in the consolidation. The Gary Railways will continue to operate the bus routes within the city of Gary. The majority of the stock of the Shore Line Company is owned by the Chicago, South Shore & South Bend Railroad and by the Gary Railways. Charles W. Chase is president of the company. Its headquarters are in Gary. The bus lines will supplement the service of these lines and will act as feeders to them. The Michigan City-St. Joseph-Benton Harbor route schedule has already been changed to meet all through limited South Shore Line trains at the former city.

South Bend Railway Adds to Bus Facilities

Transportation service into sections of South Bend, Ind., which heretofore have had no regular transport of any kind has been provided by the Chicago, South Bend & Northern Indiana Railroad through the purchase of five new 21-passenger street car type Studebaker buses.

The whole southwestern part of the city has been without service because of the cost of crossing the New York Central Railroad tracks, soon to be elevated. A section of the southeastern part of the city also has been without service, though it has developed recently into one of the finest residence sections.

R. R. Smith, vice-president and general manager of the traction system, which covers all of northern Indiana, explained the move thus:

We selected buses for this new service because of their flexibility and convenience and because development of the city has been so rapid there has been insufficient time for permanency of congestion to be established. As centers of population shift, the buses can follow them much more readily than the costly installation of tracks and roadbed. We already are operating a number of buses of various sizes to supplement our trackage. We keep a completely detailed cost record of their operation and consulted it when we came to buy new equipment.

As a result, we chose the medium-sized equipment. We found that the larger and heavier buses were fully serviceable during only two brief periods a day. During the remainder of the day they were uneconomical. This is not a new discovery; street railroads learned the lesson when they went in for the largest sized cars several years ago. A larger number of medium sized units gives greater flexibility of equipment for handling economically the wide fluctuations in load between rush hours and off peak periods. At the same time the smaller vehicle makes shorter headways practical in the off hours without making operating costs excessive.

New Line Opened.—The Boston Elevated Railway, Boston, Mass., has opened a double-deck bus line operating from the O'Reilly Monument on Commonwealth Avenue to Bowdoin Square. The fare rate will be 10 cents, with transfer privileges at any point.

Referendum Would Postpone Permit Subject.—Demands for a referendum on the bus franchises agreed upon by the Buffalo, N. Y., City Council for the International Bus Corporation, a subsidiary of the International Railway, have prompted the municipal authorities to withhold final action on the agreement until the return to Buffalo of Mayor Frank X. Schwab, who is in Europe. The franchise for two new bus lines and an agreement to allow the International Railway to scrap three trolley lines in the city were approved by a vote of three to one by the Council in committee, but when the grant came up for final approval, strong opposition developed and action was deferred. Petitions for a referendum are now being circulated in the city.

Extended Trip on Buses.—Bus service from the end of the Washington Avenue car line at the city limits on East Second Street, North Little Rock, Ark., to Tie Plant was started recently by the Inter-City Terminal Railway. De luxe buses are used in the service. The Arkansas Railroad Commission granted a permit for the service. The bus fare is 6 cents and a transfer to the street cars 4 cents additional. Transfers from street cars are given at the same rate. With service to Tie Plant, a person may go from any point in Little Rock over the lines of the Arkansas Central Power Company and the Inter-City Terminal Railway to Tie Plant for 10 cents, and 2 cents additional for the transfer at Markham and Main Streets.

Transfer to Traction Control Expected.—Transfer of a bus line from private ownership to traction control is forecast with a petition by the Midwest Transit Company, operating between Indianapolis and Lafayette, asking the Indiana Public Service Commission to permit the Indiana Motor Transit Company, the bus division of the Terre Haute, Indianapolis & Eastern Traction Company, to take over its bus permit. The Mid-West company was the Red, White and Blue Line.

Line Started Between Hudson and Framingham.—The Boston & Worcester Street Railway started a bus line between Hudson and Framingham, Mass., on April 19. The line will take in the towns of Marlboro, Southboro and Fayville and the latter town will be the transfer point for Boston or Worcester. The company expects to continue its railway service between Marlboro and Hudson. It is also planned to operate the cross-town system of trolleys in Marlboro for the benefit of industrial workers.

Licenses Renewed and Refused.—The City Council of Westfield, Mass., has renewed three bus licenses of the Springfield Street Railway to operate buses in that city. The application for new bus routes, which the railway has had up many times since they were first requested last September, were again considered, but licenses were refused.

Railway-Bus Schedule for Suburb.—Arrangements have been completed with the Jacksonville Traction Company, Jacksonville, Fla., to maintain a regular railway and bus schedule for residents of Lake Shore, a rapidly developing suburb of Jacksonville. The bus to be used for this service is of the de luxe Pullman type. The schedule is so arranged that it meets all the requirements of the school children and shoppers who live in Lake Shore.

Tourist Bus Arrives in Richmond.—The first of the two de luxe passenger buses purchased by the Virginia Electric & Power Company intended to be rented out to tourists and for use on special occasions has arrived in Richmond, Va. The new bus is named the "Virginia." The buses cost approximately $20,000.

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Financial and Corporate

Net in Seattle Cut in Half

D. W. Henderson, superintendent of the Seattle Municipal Railway, Seattle, Wash., has filed his report for 1925 with the Mayor and the City Council. The figures reveal that revenues on the railway lines are decreasing and operating expenses are growing. Passenger car revenue for 1925 was $5,851,959, compared with $6,043,981 for 1924. Operating expenses during 1925 were $5,031,917 and for 1924 $4,807,538. The income statement shows a net of $204,706 for 1925, compared with $557,243 for 1924.

At the close of the year the bonded indebtedness of the department was $13,524,500; of this $11,668,000 remained from the issue of $15,000,000 of bonds issued to cover the purchase of the lines from the Puget Sound Traction, Light & Power Company. The rest of the indebtedness was incurred in making extensions, in the purchase of the Greenwood Avenue line, construction of the Ballard line and other activities. The sum includes $176,000 in warrants issued this year for extensions. Revenue from the buses run as a part of the railway system showed an appreciable gain in 1925, with a total of $57,526, compared with $38,662 for 1924.

$2,119,120 Paid to City by Chicago Surface Lines

The sum of $2,119,120 was paid recently by the Chicago Surface Lines as the city's 55 per cent of the railway earnings during the last fiscal year. Payment was, however, made subject to a stipulation that reimbursement for $260,736 paid out of the account as income tax will be requested by the city. The city contends that the income tax settlement should only be made after the earnings are split. This would leave the city's portion tax free. In that event the tax would be paid out of the company's 45 per cent of earnings.

During the nineteen years of the present franchises the surface lines have paid into the city traction fund a total of $36,474,544. In addition to this, they have paid out $15,197,199 for street paving, $9,741,189 for street cleaning, $5,671,745 for maintenance of paving and $1,889,377 for removals of track and overhead and replacements on account of sewer installations and other underground work in the streets.

Underlying Bonds Offered to Philadelphia Riders

In order to give the car rider another opportunity to invest in the securities of the companies included in its system the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the first time is offering mortgage bonds of the West Philadelphia Passenger Railway. This opportunity presented itself by the maturity on May 1, 1926, of an issue of 5 per cent bonds of the West Philadelphia Passenger Railway. These bonds are being advertised to West Philadelphia car riders through *Service Talks*, the official paper of the Philadelphia Rapid Transit Company, and are being sold through the offices of the company's securities corporation. Bonds of this kind are not usually sold in denominations of less than $1,000, but the present issue is made available in denominations of $100 and $500. The bonds were issued in 1886, at 5 per cent interest, to mature May 1, 1926. They are now extended for 30 years, with interest increased to 5½ per cent. The total issue is $750,000. The bonds available to West Philadelphia car riders represent that part of the issue presented for redemption by those who decided to accept cash instead of taking bonds of the extended issue. The new bonds are callable at 102½ per cent of par.

North Shore Net Up $79,910

Interurban Road Continues to Break Records—1925 Revenue Six Times That of 1916—Skokie Valley Route Ready Soon—47 Limited Trains a Day Between Chicago and Milwaukee

OPERATING revenue of the Chicago, North Shore & Milwaukee Railroad in 1925 was $6,850,165, an increase of $651,178 over 1924. Gross income, after operating expenses, depreciation and taxes, was $1,613,621, an increase of $302,318. Net income after fixed charges was $780,630, an increase of $79,910.

The year 1925 marked the virtual completion of the Skokie Valley route, the new additional main line that will directly connect Libertyville and Mundelein with downtown Chicago and downtown Milwaukee, and the making of large improvements in previously existing properties.

At the time the present management assumed operation of the North Shore Line, in 1916, the road and equipment were valued at $12,251,997. In the intervening period to the end of 1925 a total of $22,089,374 additional was raised from investors and spent for right-of-way, track improvement, stations, cars and other equipment, bringing the value of the road and equipment as of the end of the year up to $34,341,371.

In 1925 a total of 18,229,160 passengers, or an increase of 1,057,975, as compared with 1924, was carried. The main line railroad carried 9,814,594 revenue passengers, an increase of 354,480 over the previous year. It transported 536,095 tons of merchandise, as compared with 333,888 tons in 1924, an increase of 202,207 tons. Its express and milk departments also showed healthy increases. North Shore Line trains operated 10,989,774 car-miles, an increase of 1,107,975 miles over the previous year. This does not include car mileage of city lines.

On the Milwaukee city lines 2,787,742 revenue pasengers were carried, an increase of 175,625. In Waukegan, where the company operates both the street railway and supplemental motor coach service, 4,663,321 passengers were carried, an increase of 352,494. On the motor coach routes, operated as auxiliary to the high-speed electrically operated railroad, 963,503 passengers were carried, an increase of 175,376 over the corresponding year.

The heavy expenditures on the Skokie Valley route, under construction during the year, tended to reduce the net income. The steady growth in business is indicated by a comparison of gross operating revenue per mile of road over the last ten years:

Year	Revenue per Mile	Year	Revenue per Mile
1916	$12,688	1921	$43,528
1917	19,203	1922	48,472
1918	31,798	1923	57,498
1919	33,278	1924	59,962
1920	40,558	1925	63,251

Another interesting sidelight on the growth in the company's business is the fact that in 1925 operating revenue was six times that of 1916.

During the year the company sold $9,950,000, par value, of first and refunding mortgage 6 per cent gold bonds. It retired $60,000 first mortgage 5 per cent gold bonds, $3,500,000 one-year 6 per cent gold notes, $1,276,000 ten-year second sinking fund gold notes, $44,400 fifteen-year 7 per cent second sinking fund gold notes and $941,300 three-year 6½ per cent second sinking

INCOME ACCOUNT OF THE CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD FOR THE YEAR ENDED DEC. 31, 1925

Operating Revenue:		
Passenger and special car revenue	$5,214,009	
Freight and express revenue	1,206,977	
Miscellaneous revenue	429,178	
		$6,850,165
Operating Expenses:		
Way and structures	$508,057	
Equipment	443,425	
Conducting transportation	2,182,664	
Power	579,731	
Traffic	234,805	
General and miscellaneous	1,118,272	$5,066,956
Net revenue from railway operation		$1,783,209
Net auxiliary operating revenue		86,993
Net revenue from operations		$1,870,203
Taxes assignable to railway operations		408,254
Operating income		$1,461,948
Non-operating income		151,672
Gross income		$1,613,621
Deductions from gross income		832,991
Net income		$780,630

STATEMENT OF SURPLUS

Surplus Jan. 1, 1925	$640,216	
Deduct: Sundry adjustments	242,981	
	$397,235	
Net income, Jan. 1 to Dec. 31, 1925	$780,630	
Less: Dividends paid	525,359	
	$255,270	
Sundry credits	81,089	
	$336,359	
Surplus, Dec. 31, 1925	$733,594	

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COMPARATIVE INCOME STATEMENT OF CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD

	1916	1920	1924	1925
Operating revenue	$1,157,191	$4,193,669	$6,198,987	$6,850,165
Operating expense	714,887	3,229,048	4,650,030	5,066,956
Net revenue—Railway operation	$442,304	$964,621	$1,548,957	$1,783,209
Net auxiliary operating revenue	.....	.....	800	86,994
Net revenue from operation	$442,304	$964,621	$1,549,757	$1,870,203
Taxes assignable to railway operation	66,038	151,746	298,609	408,255
Operating income	$376,266	$812,875	$1,251,148	$1,461,948
Non-operating income	6,208	10,332	60,155	151,673
Gross income	$382,474	$823,207	$1,311,303	$1,613,621
Fixed charges	237,996	390,196	610,583	832,991
Net income	$144,478	$433,011	$700,720	$780,630

fund gold notes and $203,000 equipment trust certificates.

Additional issues of 7 per cent cumulative prior lien stock aggregating $3,500,000 were authorized. Cash sales of prior lien stock during the year totaled $2,884,800. Quarterly dividends at the rate of 6 per cent on the preferred stock and 7 per cent on the prior lien stock were paid regularly.

With the completion of the Skokie Valley route, the company will own and operate approximately 230 miles of single track. It is significant that all of the right-of-way between Chicago and Milwaukee is entirely owned, except for short distances in a few towns aggregating about 3 miles.

At the end of the year the North Shore Line was operating 47 limited trains daily between Chicago and Milwaukee, in addition to its express and local service. Two additional non-stop limited trains were added during the year, the selection of the names being left with riders. They were named the "Northland" and the "Metropolitan." Three new express trains were also added between Highwood and Chicago. As soon as the double-tracking of the line between Lake Bluff and Mundelein was completed in July, a frequent service was started.

Parlor and dining car facilities on the limited trains continue popular. This is attested by the fact that 79,000 meals were served and 39,000 riders carried in parlor cars.

The rolling stock of the company at the end of the year consisted of 173 passenger cars, 43 merchandise despatch cars, 197 box cars and gondolas, seventeen electric locomotives and work cars and 68 motor coaches and a large number of motor trucks. All of the cars used in the Chicago-Milwaukee service are of steel. To provide for the growing traffic, 20 additional passenger cars and three more diners have been ordered at a cost of $800,000.

The merchandise despatch service is proving as popular as was anticipated. An additional convenience to the public is five merchandise despatch refrigerator cars, which will provide a service of transporting fresh meat, vegetables and other perishables to North Shore communities.

The company's motor coach business is showing a constant increase. The company has 68 motor coaches of improved type, the greater number operating upon eleven regular routes and providing a much-needed auxiliary service, particularly to residents of the countryside. In addition to the regular routes, the chartered coach business has shown a good increase.

Rehabilitation of Connecticut Line Proceeds

Plans are developing rapidly and it is expected the recently organized Danbury & Bethel Traction Company will soon be in a position to take over the old Danbury & Bethel Street Railway, which operates trolleys and buses between Danbury and Bethel, Conn.

Buses are at present co-ordinating with the trolleys with improved results. For the year 1925 the company not only paid expenses, but was able to show a net income of $29,000. This was done with a gross income lower than in 1924.

A. W. Sperry, who is engineering the reconstruction of the Danbury & Bethel company, is confident that operation can be placed on an even higher level. His further plans are said to include operation of intercity bus lines at Danbury.

Change in Control of Nashville Interurban

Control of the Nashville Interurban Railway, Nashville, Tenn., was purchased recently by Gerald B. and Lawrence Howard. The change in control has resulted in a new management to operate the 19-mile line operating between Nashville and Franklin. The present board of directors is composed of two new members, namely, Newton Cannon and Lawrence Howard. The consideration involved in the stock purchase was not stated. The outstanding securities of the line consist of $600,000 of bonds and $600,000 of stock.

Sale of Madison Avenue Surface Line Arranged

At a special meeting stockholders of the New York & Harlem Railroad, New York, ratified a contract of sale of the company's surface lines on Fourth and Madison Avenues to Charles L. Craig. The company's real estate, consisting chiefly of the carhouse site at 135th Street and Madison Avenue, is not included in the sale to Mr. Craig.

P. E. Crowley, president of the New York & Harlem, presented to the meeting a statement showing that the company's surface lines had been operated in 1925 at a deficit of $405,285, compared with a deficit of $85,911 in 1924. For two months ended Feb. 28, 1926, the deficit was $61,744. From Feb. 1, 1920, the date on which the surface lines were returned to the Harlem company by the receiver of the New York Railways, lessee, to Feb. 28, 1926, the total deficit on operation was $857,539.

Traffic, Fare and Wage Figures Reported

The increase in passenger traffic on electric railways was considerably accelerated during the month of March. The number of revenue passengers, including revenue bus passengers, reported to the American Electric Railway Association by 208 companies for the month, as compared with the same month in 1925, was as follows:

March, 1926	828,319,675
March, 1925	809,752,684
Increase	2.29 per cent

The average cash fare in 272 cities of 25,000 population and over was:

	Cents
April 1, 1926	7.6653
March 1, 1926	7.6543
April 1, 1925	7.5220

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 miles or more of single track.

	Average Hourly Rate (Cents)	Index No. 1913=100 (Per Cent)
April 1, 1926	56.63	207.82
March 1, 1926	56.63	207.82
April 1, 1926	56.03	205.61

Chicago Securities Analyzed

Edwin L. Lobdell & Company, Inc., dealers in securities at Chicago, have prepared an analysis of the Chicago traction securities based on the city purchase price for the properties as certified by the Board of Supervising Engineers aggregating $163,508,224 on Feb. 1, 1926. Some statistics are included on the Chicago Railways, the South Side Lines and the Chicago City & Connecting Railways. The pamphlet was prepared in view of the general interest in the subject of protective committees to represent security holders of the Chicago Surface Lines.

Abandonment in Westchester Authorized

Supreme Court Justice Morschauser, upon application of Eugene F. McKinley, counsel for Leverett S. Miller, receiver of the Westchester Street Railway, White Plains, N. Y., has authorized Mr. Miller to discontinue service at 11:30 o'clock on May 31. The railway connects Tarrytown, White Plains, Silver Lake, Greenburgh, Elmsford, Scarsdale and Rosedale. The company has been losing money steadily for years.

It is expected that Mr. Miller, who is president of the New York, Westchester & Boston Railway, will operate a bus system over the route of the railway when the Public Service Commission issues an order allowing the electric railway to abandon completely the different lines. The system includes more than 20 miles of track. Power for operation is purchased.

Mr. Miller was appointed receiver of the company several years ago and was also allowed to increase fare to 10 cents in certain zones.

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Loss in St. Louis $236,051

The United Railways shows a decrease in gross revenue of $618,968 for the year ended Dec. 31, 1925. Operating expenses and depreciation were reduced $409,119, but this reduction was not sufficient to avoid a net loss for the year of $236,051 compared with a surplus of $29,988 for the year previous. Taxes were increased more than $38,000 to $1,810,701. This figure is now equivalent to 9.58 per cent of the entire gross. Including taxes the operating ratio in 1925 was 87.3 per cent. The deficit for 1925 is after all operating expense, depreciation, taxes and after setting aside $2,892,515 for interest and miscellaneous fixed charges. The deficit is credited with $1,000 from bus rentals, but the bus operations are not included in this statement.

These figures are taken from an advance copy of the receiver's annual statement issued to the ELECTRIC RAILWAY JOURNAL. Separate statement of the Missouri Electric under the same receivership management shows a deficit of $59,545 after operating expenses, taxes and $35,000 interest charges and after $9,507 deficit from bus operation. This compares with a deficit of $37,940 for the preceding year.

The management has stated that bus competition, coupled with the great increase in private automobile operation, has been responsible for the falling off of gross revenue. The greatest loss of revenue occurred in the early months of 1925. The first three months of 1926 indicate an increase of more than $30,000 in gross revenue, or 0.64 of 1 per cent.

Report Explains Condition of Long Island Subsidiaries

Pertinent facts were brought out in the 44th annual report of the Long Island Railroad, New York, N. Y., with reference to its subsidiary trolley lines.

The Glen Cove Railroad proceedings in voluntary dissolution have been completed and the receiver discharged.

The Nassau County Railway discontinued operations on Dec. 31, 1924. Proceedings in voluntary distribution are under way.

The Long Island Electric Railway and the New York & Long Island Traction Company were sold under foreclosure early this year. The Long Island Railroad was interested in these lines through holdings of securities of its Long Island Consolidated Electric Company and advances made directly to these lines to keep them in operation. These lines were purchased or built to give more service to the public, increase railroad earnings and protect the properties. The use of motors and trucks on improved highways made the electric railways unprofitable. This was the chief reason for the heavy charge to profit and loss of $2,000,000, as the investment has been entirely wiped out through dissolution or foreclosure, and, together with the New York, Brooklyn & Manhattan Beach Railway merger, is largely responsible for the decreases in "investments in affiliated companies" on the general balance sheet. The communities have had the benefit of these lines, but the burden of the losses has been thrown on the Long Island Railroad. It is explained that there is no source to which the stockholders can look for recoupment or to bear at least a part of the large outlays.

Distribution of Ohio Traction Assets

Committees of Security Holders Reach Understanding on Terms for Disposal of Company's Property

Tentative agreement has been reached by the committees representing the preferred and the common stock holders that the division in the distribution of the assets of the Ohio Traction Company, Cincinnati, be placed somewhere between 1-9 and 1-10 for the common stock and between 8-9 and 9-10 for the preferred stock. Letters mailed to the stockholders by the committees declare that no definite figure has been agreed upon as yet, but say that the members of the committees feel that some such figure as that suggested would be equitable.

The committees have extended the date for the deposit of stock to May 10. On April 20 there had been deposited 74,382 shares of the preferred out of 85,000 shares and 79,798 shares of common out of 86,550 shares. The deposits represent 87½ per cent of the preferred and 92 1/10 of the common. The committees will not adopt a final definite plan until after the last day of deposit on May 10. The letters point out that inasmuch as the deal between the Ohio Traction Company and the Cincinnati Street Railway could not have been concluded without the assent of the common stock and that any reorganization plan may require action by the common stock holders, it was felt that the common stock was entitled to participate in any distribution of the assets. The committees set forth a statement of assets of the Ohio Traction Company and its subsidiaries, the Cincinnati Traction Company and the Cincinnati Car Company, as of Jan. 16, 1926. The total assets are set forth as $9,502,141. This is approximately $112 a share on the 85,000 shares of preferred stock. The assets are made up as follows:

STATEMENT OF ASSETS OF THE OHIO TRACTION COMPANY			
Cash, U. S. Treasury certificates and certificates of deposit		$1,693,168	
Cincinnati Street Railway stock, 86,661 shares (par $50) at $40 per share		3,466,440	
Traction Building—appraised value		1,404,985	
Chester Park property (land and buildings, including the Chester Park car shops) acquired from the Cincinnati Street Railway:			
Appraised value	$757,000		
Less: Leasehold	100,000	657,000	
Machinery and operating equipment in the Chester Park shops, appraised value		449,450	
Total Ohio Traction Company			$7,671,043
CINCINNATI TRACTION COMPANY			
Cash in banks and treasury		39,404	
Less: Reserve for unredeemed tickets and wages (estimated)		12,000	
Total Cincinnati Traction Company			27,404
CINCINNATI CAR COMPANY			
Land and buildings owned:			
Appraised value	$176,000		
Less: Leasehold	22,000	$154,000	
Good will, patents, etc.—appraised value		371,950	
Other assets—net value		1,277,743	
Total Cincinnati Car Company			1,803,693
Combined total			$9,502,141

The committees say that as soon as a plan is agreed upon there will be available for distribution practically $1,700,000 in cash, treasury certificates and certificates of deposit. If the other assets are kept intact, there will be available for yearly distribution a substantial income as follows:

Earnings from the Traction Building for the last few years were on an average of about $52,000 a year net.

Earnings of the Cincinnati Car Company since 1922 were as follows, to wit:

1922	$177,737
1923	244,306
1924	319,420
1925	227,481

The dividends from the 86,661 shares of Cincinnati Street Railway stock for the years 1926, 1927 and 1928 will be $216,652 a year and each year thereafter they will be $259,983 a year.

It is very likely that the assets will be held in the name of a single company, presumably the Cincinnati Car Company. If this be the case and considering all the avenues of revenue, the surviving company will have approximately $500,000 a year for distribution among its stockholders. It is planned to list the stock of the new company on the Cincinnati Stock Exchange.

Improvement Shown in Report of New Jersey Company

Combined revenues from railway and bus operations by the subsidiaries of the Public Service Corporation, Newark, N. J., for the twelve months ended March 31 were $29,303,087, an increase of $1,561,064 over the preceding year. Public Service Railway alone showed only a small net income. Operating revenues from buses increased materially, but were not sufficient to prevent a net loss of some $300,000. This, however, was only about one-fourth of the deficit shown for the year ended March 31, 1925. The consolidated statement of transportation operations showed a deficit of $241,544, against an operating deficit of $1,300,759 for the preceding twelve months, the latter not including profit of $2,358,729 from the sale of the Public Service Newark terminal to the Public Service Corporation. Railway passengers numbered 415,729,370, compared with 423,265,883 in the previous year, while the number of bus passengers increased 93,900,699 to 156,302,095.

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Balance of Gross Income in Anderson $289,051

Revenue from operations for 1925 for the Union Traction Company of Indiana, Anderson, Ind., was $2,939,182, compared with $3,339,188 for 1924. Operating expenses were $2,541,873, against $2,656,066 in 1924. The gross income for 1925, including bus operation, was $289,051. These facts were contained in the annual report of Receiver Arthur W. Brady, submitted to the court.

Fifteen steel interurban cars of the most modern design were purchased on a lease plan at a cost of $426,091. These cars were placed in operation about Nov. 1.

The report goes into detail on bus operations conducted by the company and its extension of such service during 1925. Reference is also made to the proposed discontinuance of certain railway lines.

INCOME ACCOUNT OF THE UNION TRACTION COMPANY OF INDIANA FOR 1925

Revenue from Transportation:	
Passenger	$1,964,583
Baggage	7,425
Parlor, chair and special car	8,285
Mail	4,224
Express	117,542
Milk	17,001
Freight and switching	681,238
Total	$2,800,299
Total revenue from operation other than transportation	$138,882
Total operating revenue	$2,939,181
Operating expenses:	
Way and structures	$571,129
Equipment	332,367
Power	535,600
Conducting transportation	698,672
Traffic	33,413
General and miscellaneous	370,690
Total operating expenses	$2,541,873
Net operating revenue	397,308
Taxes	125,000
Net operating revenue less taxes	272,308
Other income	52,479
Gross income	324,787
Expense of bus operation	35,736
Balance gross income	$289,050

While operation of the lines owned by the Muncie, Hartford & Fort Wayne Railway, Indianapolis, New Castle & Eastern Traction Company and the Muncie & Portland Traction Company has been continued by the receiver and the results of such operation are shown herewith, the leases of these lines held by the Union Traction Company of Indiana have not been adopted or affirmed by the receiver. This operation is only given for the convenience of all persons in interest. The accompanying account shows tentatively the segregation of earnings and expenses of the respective companies subject to the liens of the principal mortgages and also of lines leased to the Union Traction Company.

$2,895,937 Available for Charges and Dividends

The Pacific Electric Railway, Los Angeles, Cal., reports to the Railroad Commission its 1925 operating revenue at $19,514,324, compared with $20,729,482 for 1924. The operating expenses, excluding taxes, for 1925 were $15,976,043 and for 1924 $15,932,545, leaving net operating revenue of $3,538,280 for 1925 and $4,796,937 for 1924. During 1925 taxes were $1,181,699 and for 1924 they were $1,082,586. Deducting the taxes leaves operating income of $2,356,581 for 1925 and $3,714,350 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income of $2,895,937 for 1925 available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus. The similar amount for 1924 was $4,006,514.

Changes in San Francisco Depreciation Reserve

The Supervisors of San Francisco, Cal., have passed to print and in due course are expected to have in effect an ordinance, long discussed, revising accounting procedure of the Municipal railway, with respect to depreciation reserves.

The present procedure is to set up 18 per cent of gross annual revenue as "depreciation reserve." From this 4 per cent goes to accident and damage claims, and an additional sum, which just now is $201,000 a year, to bond interest and redemption.

The new ordinance segregates these deductions. It makes an amount equal to 3 per cent of total capital assets deductible from gross revenues annually for depreciation reserve after operating expenses, accident and damage claims, bond interest and redemption. The accident and damage reserve is stipulated at 2½ per cent of gross revenues.

As a matter of fact, while the new system will bring the Municipal railway's accounting more nearly into accord with corporate practice, it will not materially alter the present situation except in one respect. It is proposed to start off the new depreciation and accident funds with appropriations of $100,000 each from the present depreciation reserve. This will leave more than $700,000 free for such purpose as the Supervisors see fit. They have already predicted important improvement work, including the proposed Sunset tunnel, against it, but there is talk of a $2,000,000 bond issue to accomplish this work.

Under the present depreciation reserve system $588,000 was set aside in 1925, but after caring for bonds and accident claims, only $266,062 remained for the actual depreciation fund.

On the basis of last year's capital assets, which were figured at $7,992,410, the depreciation deduction under the proposed system would have been $239,772.

Net Income in Allentown Increases

The consolidated income account of the Lehigh Valley Transit Company, Allentown, Pa., for the year ended Dec. 31, 1925, shows an increase of $71,864, with operating expenses $74,411 below those of last year. The net earnings from operation increased $146,276 for the year. In the annual report to the stockholders P. B. Sawyer, president, says this condition was due entirely to a temporary increase in the sales of surplus power and offset a further substantial falling off in street railway business during the year.

CONSOLIDATED INCOME ACCOUNT OF THE LEHIGH VALLEY TRANSIT COMPANY AND SUBSIDIARIES

	1925	1924
Total gross earnings	$5,047,104	$4,975,240
Total operating expenses including taxes	3,603,062	3,677,474
Net earnings from operation	1,444,041	1,297,766
Income from interest on bonds	906	1,861
Income from interest on notes and deposits	3,618	7,057
Income from dividends on stocks	110,075	111,075
Total net earnings	1,558,642	1,417,761
Depreciation allowance	377,798	231,453
Interest—funded debt	599,802	600,949
Interest—floating debt	.....	31,119
Amortization of discount and expenses	21,705	21,705
	999,306	885,227
Net income	$559,335	$532,534

The property has been adequately maintained and an allowance set aside for depreciation which more nearly meets the company's requirements in that regard. Equipment trust debt to the amount of $30,000 has been retired and the cash position of the company improved.

A 5-mile relocation to private right-of-way on the Philadelphia division has been constructed at a cost of approximately $450,000. This reduces the Allentown-Philadelphia running time five minutes, relieves the company of a constantly growing highway accident liability and removes the obligation of track paving along the route that was formerly traversed.

Mr. Sawyer also refers in the report to the incorporation of the subsidiary, known as the Lehigh Valley Transportation Company, which now has in operation three passenger buses running over two routes to provide for the increase in population of the territory served. The accompanying table shows the income account for the year ended Dec. 31, 1925, compared with the year previous.

	Total Operating Revenue	Total Operating Expenses	Taxes	Other Income	Gross Income
Union Traction	$1,384,629	$1,252,857	$46,925	$24,084	$108,931
Indianapolis Northern	743,810	586,512	29,837	16,512	143,972
Muncie, Hartford & Fort Wayne	255,680	209,362	13,450	3,450	36,318
Muncie-Portland	101,349	88,026	6,087	1,056	8,292
Indianapolis, Newcastle and Eastern	275,271	223,141	10,312	4,295	46,121
Muncie-Union City	103,914	103,247	10,237	1,652	*7,918
Marion-Wabash	56,042	58,432	5,300	1,024	*6,665
Anderson-Middletown	18,483	20,292	2,850	401	*4,256
Total	$2,939,181	$2,541,873	$125,000	$52,479	$324,787

*Deficit.

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Bondholder's Plea Rejected. — The United States Supreme Court has refused to review the case of Milton Von Boston, an Eastern bondholder of the United Railways, St. Louis, Mo., who sought to intervene in the company's receivership suit. Previously his petition had been denied by United States District Judge Faris and the United States Circuit Court of Appeals. Mr. Von Boston sought to have declared due and payable the $30,000,000 issue of general mortgage bonds. Judge Faris in dismissing his petition held that the acts complained of had not constituted a breach which gave him the right to enforce the foreclosure terms of the general mortgage.

Deficit of $156,887 for Three Months. —The Eastern Massachusetts Street Railway, Boston, Mass., reports to the Department of Public Utilities, for the quarter ended March 31, 1925, a net income of $277,204, after fixed charges, equivalent after sinking fund and preferred dividends to 72 cents a share on the 84,698 shares of common stock outstanding, as compared with $241,262, or 29 cents a share, in the corresponding quarter a year ago. After payment of dividends the deficit was $156,887, compared with $191,338. As of March 31, 1926, current assets stood at $3,264,920 and current liabilities $798,066, leaving net working capital of $2,466,854.

Change in Financial Structure Sought. — The Jamaica-Central Railways, Inc., has filed a certificate in the office of the Secretary of State of New York, changing the par value of its stock from 2,000 shares, $100 par value, to 2,000 shares, no par value. This company was recently organized for the purpose of rescuing three routes in Long Island which were to be abandoned. These lines were controlled by the Long Island Electric Railway. Reference to the Jamaica-Central Railways was made in the ELECTRIC RAILWAY JOURNAL, issue of April 3, 1926, page 606.

Interest Money Advanced.—W. F. Turner, president of the Oregon Electric Railway, Portland, Ore., stated that prompt payment would be made this year on May 1 of the semi-annual interest on $2,000,000 of 5 per cent bonds of that company. The electric line has not been earning its interest, but the parent line, the Spokane, Portland & Seattle Railroad, of which Mr. Turner is also president, was expected to advance the money to meet the obligation. The Oregon Electric is a valuable feeder from the Willamette Valley.

New Directors of United Light and Power.—Further changes are announced in the directorate of the United Light & Power Company, Chicago. Two new directors were elected. They were R. B. MacDonald, vice-president of the Tri-City Railway & Light Company, a United Light subsidiary, and H. C. McClintic of McClintic & Marshall, structural steel firm of Pittsburgh. They succeed Bertrand A. Howe and Warren A. Snow of Howe, Snow & Bertles, Inc., a company which in the past has participated in United Light financing. Other new directors elected since Mr. Hulswit's resignation as president were H. B. Rust, J. S. Brookes and Richard Ingliss, representing the Koppers Company and Otis & Company.

Increase in Traffic for First Quarter. —Revenue passengers carried by the United Railways, St. Louis, Mo., showed a gratifying increase during the first quarter of this year, according to a report filed with the City Register's office on April 19. The report covering the three months ended on March 31 shows the company operated on an average of 1,224 cars daily, made 1,447,990 trips, traveled 9,423,687 car-miles and carried 64,686,265 revenue passengers. In a similar period in 1925 the company used on an average 1,250 cars daily and hauled 64,478,098 revenue passengers.

Book Reviews

Electric Railway Engineering

By C. Francis Harding, professor of electrical engineering, assisted by Dressel D. Ewing, professor of electrical railway engineering, both of Purdue University. Third edition. McGraw-Hill Book Company, Inc., New York, 1926. $5.

This textbook is now in its third edition, the first having been published in 1911. In the preface it is stated that "although the fundamental principles underlying the operation of electric locomotives, cars and trains have not changed materially since the publication of the second edition of this book in 1915, the variety and type of their applications to practice during the past decade, as well as the new statistical data now available, seem to warrant a completely revised and enlarged third edition." Following out this idea, a new chapter has been added to introduce some of the economic problems involved in bus transportation, while the chapter on power station location and design has given way to one on sources of electrical energy.

It is unfortunate that the authors did not find it possible to bring some of the important chapters of the book more thoroughly up to date. For instance, in the chapter on "Traffic Studies—Predetermined" the tabulation on electric railway statistics is taken from the United States census on street and electric railways for 1907. Save for a paragraph on bus competition, the text in this chapter is virtually unchanged from the previous edition. On page 26 the statement is made that "a well-conducted road may safely be assumed to earn 20 cents per car-mile." While this may have been true in 1911, it does not depict present-day conditions.

The chapter on cars shows a particular lack of revision to meet modern practice. While a few sentences have been added to certain paragraphs, there are many statements that are not in keeping with the present. Such statements as the following indicate failure to appreciate the situation: "In the large cities the convertible or semi-convertible double-truck cars . . . are still being used, although many of them have been equipped with the various prepayment devices." "The stepless, center-entrance car introduced in New York City a few years ago is becoming an extremely popular type of car for service in large cities." "Several companies operating in large cities have again introduced types of double-deck cars." "During the last few years the Birney safety car has become exceedingly popular." "Open running board cars are used much more in the East than in the Middle West for suburban service." "The great improvements made during the last few years in storage batteries, bearings and light mechanical parts, brought about largely by the wonderful development of the modern automobile, have contributed much to the success of this type of car for certain classes of service. In 1913 there were 280 of the cars in use. . . . The number has increased considerably since then."

In using the book as a reference or as a text, therefore, care should be taken not to use directly the reference to practice, since the revision has left a large part of the material fully ten years behind the present state of the art.

French-English and English-French Dictionary

By J. O. Kettridge. The H. W. Wilson Company, New York, N. Y. Two volumes, 1,160 pages. From London, $12.50; from New York, $14; Vol. I—French-English, $7.50 postpaid from New York.

This dictionary contains technical terms and phrases used in civil, mechanical, electrical and mining engineering and allied sciences and industries; also a method of telegraphic coding by which any entry in the dictionary can be expressed by a ten-letter cipher word with indicator and check. It contains the translation of 100,000 words, terms and phrases, illustrated by numerous instructive examples and explanations, the whole arranged on original plans in progressive alphabetical order in the readiest form for rapid reference. Many libraries and technical departments of colleges have ordered this dictionary for their reference shelves.

Statistics of Railways in the United States

Thirty-eighth annual report, for the year ended Dec. 31, 1924. Prepared by the Bureau of Statistics, Government Printing Office, Washington, D. C. 112 pages. 15 cents.

The text of this report contains statistics based on the monthly reports of railways for the year 1925, as well as selected data relating to other common carriers subject to the interstate commerce act for the years 1924 and 1925.

Although the title "Statistics of Railways in the United States" is retained, certain tables relating to other classes of common carriers subject to the interstate commerce act are also included. Because of the necessity for the greatest possible economy in printing expense, the usual section of the report giving a detailed list of securities owned and outstanding has been omitted, as was also done in the case of that for 1923. Accident statistics have been omitted from this volume.

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Personal Items

H. L. Mack Leaves International

Executive of Buffalo System Plans to Enter Contracting Business for Himself

H. L. Mack, vice-president of the International Railway, Buffalo, N. Y., has resigned, effective May 1, to enter the general contracting and engineering field. Mr. Mack has been connected with the street railway system in Buffalo since 1892, when he became a lineman for the Buffalo Street Railway after several years of experience with the Big Four Railroad. Three years later he was placed in charge of this department. Later the department

H. L. Mack

took over the construction and maintenance of all track, bridges and buildings of the International system.

In March, 1923, Mr. Mack was elected vice-president in charge of engineering and a director of the International Railway. The construction of the Buffalo-Niagara Falls high-speed interurban line was under the supervision of Mr. Mack and he also supervised the construction of the Lockport-Olcott interurban division. He has seen the Buffalo street railway system grow from a road of 90 miles to a system of more than 400 miles in Buffalo, Niagara Falls and Lockport, with interurban lines reaching into more than a score of communities in western New York.

In his letter of resignation to B. J. Yungbluth, president of the International Railway, Mr. Mack said:

> For many years it has been my ambition to enter the contracting business for myself, but each time that I have come to the decision some crisis in the affairs of the company has kept me in service, forcing me to lay aside my personal plans. I now feel that the time has arrived when I can carry out this purpose without seriously disorganizing the work of the company, and therefore ask you to accept my resignation as of May 1. My interest will always be with the International and I hope you will feel free to call upon me whenever you think I may be of service.

Mr. Mack is recognized as one of the leaders in his line in the country. The catenary type of construction developed by him for the Buffalo-Niagara Falls high-speed line attracted much attention in the engineering world.

Personnel Changes in Nashville

G. B. Howard has replaced John H. Carpenter as president of the Nashville Interurban Railway, Nashville, Tenn. The new president and his brother, Lawrence Howard, who will assume the position of secretary and treasurer, are sons of the late J. W. Howard, one of the group that built the railroad, which began operations in 1908.

John A. Pitts remains as vice-president.

J. E. Napier, formerly assistant treasurer, has been made general manager. Mr. Napier has been long connected with the enterprise in the offices at both Franklin and Nashville.

The Nashville Interurban Railway operates 19 miles, connecting Franklin, Grentwood, Nashville and Mount Pleasant.

M. J. Curtin Promoted by Boston Elevated

M. J. Curtin, tie and timber agent of the Boston Elevated Railway, Boston, Mass., has been appointed to the position of supervisor of stores and yards of that company. Mr. Curtin has been connected with the Boston Elevated Railway for twelve years. He went to work for the company as a sub-foreman on track construction. Later he was construction foreman at the carhouses and on building work. He has been tie and timber agent for the past six years.

Mr. Curtin's experience covers a wide range of work in the contracting field. He is a high school graduate and did his first work in engineering in the drafting room of a contracting firm. He entered street railway work with the old Bay State Street Railway, now the Eastern Massachusetts Street Railway. Eventually he became civil engineer of that company. His experience in this line of work also covers a period during which he was foreman for contractors engaged in important street construction work. He has been a member of the committee on wood preservation of the American Electric Railway Engineering Association for several years.

H. G. Tulley Heads Cab Company

Mr. Tulley recently returned to Management, Inc., has been elected president of the Yellow Cab Company of Philadelphia, Pa., recently taken over by the Philadelphia Rapid Transit Company. In this capacity he replaces W. E. McGuirk of New York.

Mr. Tulley, recently returned to Philadelphia from Buffalo, where he was associated with the International Railway. He went with Mitten Management in Philadelphia fifteen years ago. He was one of the important factors in the rehabilitation of the Philadelphia Rapid Transit System.

A. J. Challeen on Detroit United

New Superintendent of Equipment Progressive and Alert on Things Mechanical

A. J. Challeen has succeeded Hugh Savage as superintendent of equipment and shops for the Detroit United Railway, Detroit, Mich. In his new post Mr. Challeen has been devoting particular attention to improving the appearance of the rolling stock of the company. This he has sought to do through the use of various painting effects so as to give a streamline appearance to cars. As a result he has made some of the older type equipment particularly attractive. In addition to car maintenance, Mr. Challeen has also

A. J. Challeen

been devoting special attention to bus maintenance and to improving the riding qualities and appearance of the buses operated by the Detroit United Railway. This, of course, is the esthetic side of the matter. There is, however, another side, the purely utilitarian. Mr. Challeen knows that, too. He is particularly well informed in regard to car design and various types of car construction.

Mr. Challeen was born in Rush City, Minn. His scholastic training included special courses in mechanical and electrical work at the University of Minnesota. He then entered electric railway work with the Twin City Lines. This was in 1908. In 1912 he was made general repair foreman in one of the outlying shops of the company. In 1921 he was advanced to general foreman of the principal repair shop of the Twin City Company. In March, 1925, he left the Twin City Company to take up duties as mechanical superintendent under A. L. Drum of the Light-Weight Noiseless Electric Street Car Company. Since June, 1925, he has been with the Detroit United Railway, of which Mr. Drum is manager for the receivers. Mr. Savage, who was succeeded at Detroit by Mr. Challeen, resigned from the property there to become connected with the Brooklyn City Railroad.

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Utility Man Is Pine Bluff's Most Useful Citizen

Harvey C. Couch, president of the Arkansas Light & Power Company, Pine Bluff, Ark., and interested in other large projects for the development of Arkansas and the south, has been declared Pine Bluff's most useful citizen and has been selected to receive the Chamber of Commerce good citizenship award of 1925, for which he will be presented the *Commercial* loving cup.

The award was made to Mr. Couch on the grounds of his great and untiring efforts for development of Pine Bluff and Arkansas, particularly with reference to electrical power developments. Mr. Couch is actively identified with all civic movements for the betterment of city and community and an untiring worker in the Chamber of Commerce.

In an editorial headed "Honored in His Own Country" the Pine Bluff *Commercial* on Feb. 16 said:

> Many signal honors have been visited upon Harvey C. Couch, empire builder, dreamer of dreams that come true and mighty factor for progress in this, the wonder state. And not the least of these is the awarding of the Pine Bluff good citizenship trophy, voted to Mr. Couch by the unanimous voice of a committee representing every activity, every walk of life and every phase of community life in Pine Bluff.
>
> This award would be significant if for no other reason than that it is proof positive that Pine Bluff is not unappreciative of the efforts made by Mr. Couch for the progress of this city, proof that this city realizes the door Mr. Couch has opened to opportunity and development and proof that all prophets are not without honor in their own country.

Richard Schaddelee Heads United Light Group

Much interest attaches to the career of Richard Schaddelee, who recently succeeded Frank T. Hulswit as president of the United Light & Power Company, Chicago, an organization with public utility holdings wide in their ramifications, particularly in the Central West. Not only is Mr. Schaddelee camera shy, but heretofore he has successfully eluded the seeker of biographical facts. Despite the load that he has long carried as an officer of the United Power & Light, this man, who rose from $20 a month as a meter reader and bill collector to the presidency of a great corporation, has escaped the public eye.

Born in the Netherlands in 1873, Mr. Schaddelee came to the United States at the age of fourteen. The excellent schools of his native country laid the foundation for a remarkable self-acquired education. Aside from a few weeks in the public schools of Holland, Mich., he had no opportunity for study and higher education, so far as schools were concerned.

Working for a carpenter in the Michigan village, his first wage was $1.25 a week. When the family moved to Grand Rapids the boy found work in a furniture factory, where he spent two years, in which time he learned to speak and write the English language.

Several jobs intervened before he went into the employ of the Gas Light Company of Grand Rapids, Mich., in 1892, at a salary of $20 a month. As a meter reader and bill collector, he showed unusual ability in collecting bad accounts. He advanced through various office jobs to the post of cashier and head of the credit department.

His reputation for doing things and getting results won an appointment by bankers of Grand Rapids to take charge of a small gas plant at Albion, Mich. His success as a manager settled him in his life work and started him on his long road to national prominence in the public utility business.

Among the United Light properties are several electric railways operated in towns of medium size. Their problems have always received Mr. Schaddelee's earnest attention. He has felt that the occasional rider on the electric railway should pay more for the service than does the man who uses the road habitually. He has given expression to these views many times, and has embodied the principle behind them in a form of commutation ticket which he worked out successfully for application on several of the properties included in the United Light & Power group.

Obituary

Victor Angerer

Victor Angerer, vice-president of the Taylor-Wharton Iron & Steel Company and a vice-president and a director of the subsidiaries of that company, William Wharton, Jr., & Company, Easton, Pa., the Philadelphia Roll & Machine Company, Philadelphia, Pa., and the Tioga Steel & Iron Company, Philadelphia, died on May 5. He had been connected with these companies and their predecessors since 1884.

Mr. Angerer was one of the foremost authorities in the United States on special trackwork. Twenty of twenty-five years ago he was working on problems the solution of which is just being accepted today. In the course of his career he designed many switches and frogs and special trackwork devices. He made many experiments, particularly in connection with the so-called Trilby rail. He also gave a great deal of attention to the proper design of other rail sections, particularly of rails and guards for curves. His studies of the question of the fatigue of steel won for him high recognition in scientific circles.

He was very openminded in his approach to problems presented to him for solution, and particularly in committee work established a reputation for himself by his consideration of others who advanced ideas not always compatible with his own. His scientific interest in the problems with which he was concerned always transcended his interest in them as a manufacturer, and no little credit is due to him for his advancement of the science of track engineering. He was always seeking out the reasons for things, and by himself, but primarily in the interest of his own company, conducted early in 1925 a survey of conditions to determine the present status and future prospects of the electric railways. Like him he applied some tests to this study that were new. And then he unselfishly made public his findings through the ELECTRIC RAILWAY JOURNAL for the benefit of the entire industry. Incidentally it might be mentioned that this was only one of his many contributions to the literature of the industry made through the JOURNAL.

Born in Vienna, Austria, on June 4, 1861, Mr. Angerer was educated at the Technical College in Vienna. His first work in the United States was as a draughtsman with William Sellers & Company where he remained four years. He then entered the employ of William Wharton, Jr., & Company as mechanical engineer. In 1886 he was made chief engineer of that company, superintendent in 1889, second vice-president and works manager in 1897 and vice-president and general manager in 1902. When the firm was consolidated with the Taylor Iron & Steel Company in 1912 he was made vice-president of the Taylor-Wharton Iron & Steel Company.

Mr. Angerer's A.E.R.A. committee activities date from 1920. Since then he has been a member of the committee on way matters. Prior to 1920 he gave the committees the benefit of his advice and help, but he did not participate in the proceedings as a member because such formal participation by manufacturers was not then countenanced. In 1923 he was also a member of the special committee appointed to develop standard wheel and rail contours. More recently he was a member of the newly-organized way and structures committee and at the time of his death was chairman of a special committee on the design of steam and electric railway crossings. In addition to these activities with the A.E.R.A. Mr. Angerer has been chairman since 1923 of an A.E.S.C. sectional committee to develop American standards specifications for special trackwork material and also standard designs for 7-in. T-rail for use in paved streets. He was a member of many other scientific and engineering bodies.

Thomas Millen

Thomas Millen, who was master mechanic of the Metropolitan Street Railway, New York, from 1894 to 1908, died on May 1 in New York at the age of 77. Prior to his connection with the Metropolitan Street Railway, Mr. Millen's experience had been with steam railroad companies, including the Central Railroad of New Jersey, Delaware, Lackawanna & Western Railroad and New York City & Northern Railway. He was connected with the Metropolitan Street Railway during the time that the lines of this company were electrically equipped and when experience with the underground conduit system was very meager. This meant that important problems in the selection and maintenance of large quantities of rolling stock had to be undertaken under Mr. Millen's direction. His ability is shown by the fact that much of this equipment and many methods adopted at that time are in use at the present day. Mr. Millen retired from the railway business when he left the Metropolitan Street Railway.

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Better Merchandising Is Bringing Results

Local Transportation Industry Is Moving Forward Rapidly—Equipment Purchases Are Expected to Be Double Last Year's—Broadened Conception of Their Part in Community Life Giving Transportation Men New Incentive

AN INTERVIEW

By Charles Gordon

"THE trend of thought and effort at the present time among executives, engineers and operating staff officers of our electric railways is directed toward a grasp more embrasive of the whole transportation problem. In the past, engineering considerations were largely the governing factors. Measures for securing the absolute minimum in power consumption, first cost and maintenance, combined with the greatest possible durability, were of major interest. Recently, however, attention has been directed to the car unit from the broader viewpoint of its business-getting possibilities. In general, it may be stated in a sense that electric railway equipment in the past has been somewhat overengineered, and, if we may coin an expression, "under-merchandised."

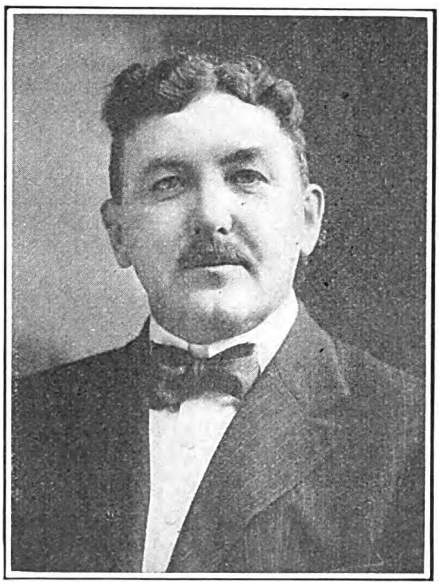
With this introduction Myles Lambert, transportation sales manager Westinghouse Electric & Manufacturing Company, started his reply to my first question regarding the tendencies in electric railway equipment design. From this point on my task was relatively simple. The subject opened up the entire field of the electric railway outlook, and there I had struck into a subject on which Myles Lambert stands out as one of the most progressive thinkers in the industry.

"The effort toward the reduction of weight started a decade or so ago," he continued, "and the consequent reduction in power consumption, has been a healthy influence in the direction of greater efficiency. This was particularly true on properties where the Birney type of ultra-lightweight car was applied to give more frequent service and at the same time to effect operating economies as the only available means of showing improved net results at the end of the year.

Lack of Co-ordinated Effort in Design

"A few years ago Britton I. Budd directed a broadside at the electric railway equipment manufacturers by telling them that they were more or less 'asleep at the switch.' Aside from some progress in weight reduction and a few other improvements, he said that we still have about the same old car that we had ten or fifteen years ago. Against this he contrasted the progress that has been made by private automobile and bus manufacturers in improving the performance, attractiveness and comfort of their vehicles.

"It was pointed out to Mr. Budd at that time that there is a great difference between the two enterprises because the automobile has developed a large quantity demand, enabling the manufacturers to enjoy 'quantity production' costs and resulting profits. A goodly share of this profit has been used further to advertise and merchandise that industry. Such 'quantity demand' has never existed for electric railway cars. The total number of street cars in the United States is far less than one year's output for any one of the larger automobile plants, and, in addition, such a thing as a standard street car is unknown. In a word, the automobile industry is on a manufacturing basis, while the electric railway car is built on a special design, 'job building' basis.



Myles Lambert

"The bus has been helped in design by the competition among manufacturers for a new market which has offered the incentive for commercial engineering minds to concentrate on producing complete vehicles designed throughout for a specific objective. In contrast to this the electric railway car has been developed by several independent groups of engineers, each group acting and thinking largely about that part of the car equipment for which it is responsible. The railway operating engineer has followed the practice of specifying in general the construction of car body and trucks, frequently issuing exact specifications. Manufacturers of other parts of the equipment have thus been obliged to build their product to suit the particular car weight, truck, axle dimensions and schedule speeds specified. In every job the motor size varies with all of these factors and, in addition, with the grades and other operating conditions in each city for which the cars are destined. Hence electric railway car development has been retarded by lack of co-ordinated effort toward a unified design and has of course suffered in comparison with the automotive vehicle as a result.

"Mr. Budd's discussion of the subject did its part in exciting further thought and activity not only in the direction of more attractive car designs but it also stimulated interest in the subject of better co-ordination in design effort among all the manufacturers who share in the production of the apparatus that is embraced in the complete car. Mr. Storrs is now promoting the effort to bring about greater co-ordination of manufacturing effort, as an association activity.

Commercial Engineering Now Rules Car Design

"Power consumption, weight, first cost, low maintenance and durability are of course still important factors in car design, but they are no longer the ruling factors. The primary considerations today are the things that determine the business-getting possibilities of the car for a given service. For example, rapid acceleration and high schedule speeds are now considered far more important than power consumption. Comfortable, attractive cars are of more importance than first cost and low maintenance. The entire subject must be approached from the commercial angle of determining what practice will give the greatest return on the entire investment. If a more comfortable and attractive car will draw sufficient additional business to give increased profits, even though first cost is increased, business logic leaves no other choice. In addition to the other factors named, reduction of noise is an important step toward better merchandising. Noise is a natural accompaniment of a motor arrangement in which a large proportion of the weight is not spring-suspended."

Mention of noise reduction opened up a subject that has apparently received more attention in Europe than in the United States. It was also a subject on which Myles Lambert is particularly qualified to talk from his intimate association with the development of existing forms of electric railway apparatus in this country. His views represent an intensely practical experience and keen vision. He denies the right to be classed as an engineer, yet his function for many years was to make the product of engineers perform

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satisfactorily under actual service conditions. Thus his views are founded not on theory, but practice.

Myles started his active association with the local transportation industry in Brooklyn. Electric power for rapid transit lines in Greater New York was initially tried on the old Kings County "L" system in 1898, where Mr. Lambert later held the position of division superintendent. He had risen rapidly to this post of responsibility from a job as ticket agent and telegraph operator, with a previous background of odd jobs such as a farm boy of fifteen was able to grow into. As a messenger, tower helper and brakeman on the Long Island Railroad he had managed to pick up a knowledge of telegraphy which enabled him to get employment with the "L" system in Brooklyn.

But electrification brought him a new outlook. In 1900 he resigned from his hard-won position to take an apprentice course in the Westinghouse plant at East Pittsburgh. On its completion after two years he was made a supervisor of railway equipment installation and construction work and was assigned for a year on the Boston "L" system. He had charge of the work on the sample car equipped with Westinghouse apparatus on one of the first New York subway cars, also the re-equipment of the Metropolitan Elevated in Chicago when it was changed from "L" type control to multiple-unit operation. In Chicago he also supervised the work of equipping a group of new cars on the South Side elevated lines to operate in trains with the original Sprague control equipment.

Mr. Lambert moved forward steadily in the Westinghouse organization. From service activity he was placed in charge of railway equipment sales at East Pittsburgh and later was made assistant manager of the railway department. He was again moved up to manager of the department, and in that position has kept in intimate contact with the industry in which he pioneered. He has recently been made transportation sales manager in charge of all transportation sales for the company; heavy and light railway, marine, automotive and mining. Although primarily an electrical man, he takes a broad view on local transportation, holding that anything which contributes to the development of transportation is of benefit to all industry in that it contributes to the development of cities which have made modern industry possible.

Considers Transportation as True Public Service

He looks on the work of the transportation man as being in the broadest sense a true public service so tied up with the welfare of the country as to call for the highest degree of devotion and skill. Myles Lambert practices what he preaches and is never too busy to devote his time and fertile mind to the upbuilding of the industry. He has won added respect and esteem by his readiness to put aside commercial expediency in favor of what he considers to be in the interest of the industry's welfare.

Noise reduction opened up the whole question of the fundamentals of motor mounting and truck arrangement. I asked Myles for an opinion on the possibilities of worm or bevel gear types of drive in which the motor may be detached from the axle and mounted either in a spring-suspended sub-frame on the truck or on the car body directly.

"Research work up to the present time," he said, "indicates that a worm-driven motor vehicle, while less noisy than the present construction, does not meet the propulsion requirements of American operating practice. At the same time such forms of construction tend to be much more expensive than the present simple arrangement and offer serious difficulties to convenient maintenance and rapid repair.

Reduction of Unsprung Weight Is Possible

"There is, however," he continued, "a possibility of developing a form of motor suspension that, while carrying the motor on the axle, would nevertheless make it entirely spring-suspended. Reduction of the amount of weight now unsprung does not necessarily require a wide departure from the present arrangement of motors in trucks. On single-truck equipment the worm or bevel drive construction may prove satisfactory. But on double-truck cars it presents serious complications and difficulties in construction."

"Since a considerable part of car noise is attributable to the effects of worn bearings, particularly at the axle, what opportunities do you see for the introduction of anti-friction bearings to car construction?" I asked.

"The combination of such bearings on armature and axle would have the advantage of maintaining gear alignment and consequently reducing noise and vibration. However, such construction without other improvements at the same time would not relieve the unsprung weight situation. This would be serious on the bearings themselves, would produce complications in motor design and would present several maintenance difficulties."

"What, then, do you anticipate in the line of improving the present arrangement of driving mechanism," I persisted.

"I believe that improvement will be in the general nature of reducing the present amount of unsprung weight, while at the same time retaining the principal features of the present simple construction. Such development is unquestionably on its way."

There was room for more discussion here, but there were many other questions of moment on which I wanted Myles Lambert's views. Consequently I switched back to the question of merchandising service.

"What are your views on the possibilities for improving transportation on street railways so as to attract riders who now use private conveyances?" I asked.

"There are both geographical and social considerations that must be taken into account. In an industrial district, for example, speed and frequency of service are the ruling considerations. Here the rate of fare is an attraction. In residential sections comfort and attractiveness take precedence in building patronage. The fare becomes a secondary consideration."

"What do you foresee for business in the electric railway field during the present year?"

"From the interest in new equipment manifested by active inquiries now coming in, which are a result in large part of the aggressive advertising and better selling within the industry, it is a conservative estimate to say that equipment business for the present year will more than double that of last year. In my judgment the industry is genuinely interested in the improvement of its cars. Business conditions for the manufacturing side of the industry are definitely on the up-grade."

"Do you think this is just a spurt or that this improved condition will continue?" I persisted.

"Samuel Insull answered that question recently in his address before the Advisory Council conference in Chicago when he said emphatically that one of the principal troubles with the electric railway industry has been that many properties lack the courage to provide the equipment needed to bring them back to a sound earning basis. To my mind the present activity in the electric railway market is a definite indication that many railway managements have determined to provide improved facilities as the solution to the problem of increasing railway revenues. I am convinced that this movement is rapidly gaining momentum and that the improvement of local transportation properties will continue to accompany the expansion and economic development of American communities. Without adequate transportation facilities modern cities cannot grow normally. The improvement program now getting under way will quickly make itself felt in the public mind. Effective demonstration of the advantages of improved transit facilities will lead to a new basis of co-operation between the transportation companies and the public they serve.

Renewed Courage in Industry

"Electric railway executives are acquiring renewed courage and a broader grasp of the whole local transportation problem. They are prepared to utilize any type of vehicle or equipment that is best suited to a particular service requirement. There is no question but that a demand for more and better transportation service exists in every community. With the continued growth in population that is taking place this demand is bound to increase. Adding to this the resulting business development that must ensue, there will be a corresponding growth in the demand for new and better cars and buses. There is still much to be done and some properties are slow in starting, but present tendencies make the future look bright indeed."

"Assume that both manufacturers and operators will push the matter of better equipment and more intensive merchandising of this improved service," I asked, "what other factors require increased attention at this time in order to push the industry forward toward improved conditions?"

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The answer came quickly. Myles seemed prepared for my question.

"There is a need for a more profound economic knowledge of the transportation business by the rank and file of the manufacturers' representatives serving the industry and similarly by those throughout the operating organizations of transportation companies," he declared. "This large group of several hundred thousand individuals all need to have a clearer conception of the part which transportation plays in our everyday economic, social and industrial life. They need to become more interested as individuals in the improvement of transportation service. Either choice or chance put them into this most fascinating service to modern society.

"Every individual has his duties and obligations in the modern social structure, but transportation is an underlying basic service upon which the very existence of the modern community depends. Transportation men in every city need a more vivid conception of the part which they play in their everyday duties as individual members of an organization that carries the responsibility of making the modern city possible. Here is the romantic side of what has sometimes been considered a prosaic occupation. When each man from track cleaner to president is imbued with this conception of service and is determined to do his part in understanding the fundamentals of the relations which his company bears to the community, then indeed will the future of the local transportation industry be assured. When every employee understands the relation between the part he plays and the general job of carrying safely and efficiently the millions who daily use transportation service, the problems of public relations will be solved automatically. They must understand not only their part in this general scheme but they must be willing and ready to carry to their customers, both by word and by deed, this conception of their part in the complex structure of modern community life."

Public Service Orders More Gas-Electric Buses

Further replacement of its older buses by new vehicles is foreshadowed in the order recently placed by the Public Service Transportation Company, Newark, N. J., a subsidiary of the Public Service Railway, for 54 additional gas-electrics. This supplementary order increases from 333 to 387 the total number of gas-electric buses purchased by the railway from the Yellow Truck & Coach Manufacturing Company. Body work and painting on the first 200 is being done by the manufacturer, but the rest are being finished in the Plank Road Shops of the railway.

The first group of the new buses was placed in service on the Market line in Newark on April 21. Shortly after, service on the new Bergen Turnpike bus line was commenced with gas-electrics. Since then they have been put in operation also on other lines, proving very satisfactory and popular with the public. It is expected that the entire order will be completed within two or three months and all the buses in service.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Advantages of Modern Cars Re-emphasized

J. G. Brill Company, Philadelphia, Pa., has issued in booklet form the first reprint of a series of advertisements from the ELECTRIC RAILWAY JOURNAL emphasizing the advantages of modern cars, "the need of a great industry." The company is distributing 5,000 of these reprints to the railway industry and the members of the American Investment Bankers Association. With the series on modern cars and their displacement of obsolete equipment, the Brill company intends to keep alive the interest in this subject, which it thinks means increased riding and in the final analysis ability to pay dividends. This first reprint, leaflet No. 302, April, 1926, shows what can be done with modern equipment.

Freeman & Company to Finance Bus Purchases

Interests headed by Freeman & Company, New York, have announced plans for an organization to finance bus equipment trusts. The organization will be known as the National Transportation Lines Corporation.

The new corporation would simplify the legal procedure involved in bus financing, in that equipment trust certificates of such a vendor corporation would form a marketable security. Several equipment trust issues marketed in recent years had included buses with other collateral, and last fall a substantial issue of motor bus certificates entirely secured by buses and indorsed by the Chicago Motor Coach Company was sold by a group consisting of J. & W. Seligman & Company, G. M.-P. Murphy & Company and Freeman & Company.

The National Transportation Lines Corporation will be operated by Freeman & Company on lines similar to those of the National Steel Car Lines Company, which was formed by them in 1920 to finance purchases of tank cars, refrigerator cars and other special types of railroad equipment. For many years Freeman & Company have specialized in the sale of equipment trust obligations secured by pledge of steam railroad rolling stock.

Metal, Coal and Material Prices

Metals—New York	May 4, 1926
Copper, electrolytic, cents per lb	13.825
Copper wire, cents per lb	16.00
Lead, cents per lb	7.85
Zinc, cents per lb	7.12
Tin, Straits, cents per lb	63.25
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.825
Central, Ill., screenings, Chicago, net tons	1.575
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.30
White lead in oil (100-lb. keg), N. Y., cents per lb	15.00
Turpentine (bbl. lots), N. Y., per gal	$0.85

Specialties for Buses Covered in New Catalog

The Electric Service Supplies Company, Philadelphia, Pa., has issued Catalog No. 9, listing complete lines of equipment for buses. The manufacturer states that practically all of the material catalogued has been in service for at least two years. The equipment shown is rugged, in line with the need for substantial and failure-proof transportation units.

Some of the more important equipment listed in this catalog includes Hunter illuminated destination signs, Faraday passenger signal systems, Golden Glow headlamps, Keystone-Ivanhoe bus lighting fixtures, fare registers, signal keys, pull switches, door switches, ventilators, windshield cleaners, etc.

For the past twenty years the Electric Service Supplies Company has specialized in similar equipment for electric railway cars with great success.

Fifty Double-Deckers Ordered by Detroit from Fageol

Purchase of 50 double-deck, 60-passenger Fageol motor coaches by the Department of Street Railways at Detroit was approved by the Council on May 4. Delivery will begin within four months, under the terms of the bid offered by the Fageol company. This company, bidding under its own name, was the low bidder at the opening of the tenders on May 3 at D. S. R. headquarters. The Fageol price was $12,050 a bus, without tires.

It was originally planned to purchase 125 of these buses, but on examination of city finances it was found the city could pay cash by purchasing 50 buses at once.

Plans for the use of the coaches are being formulated by the Department of Street Railways, but the disposition of the coaches has not been decided, according to H. U. Wallace, general manager. G. Ogden Ellis, president of the Street Railway Commission, in announcing a few weeks ago the department's intentions to call for cash bids on 50 coaches, declared that the first of the coaches would be used to establish a Fourteenth Avenue line, from Chicago Boulevard south to West Grand Boulevard, thence over Holden Avenue to Cass Avenue and Second Boulevard to a point downtown.

Specifications drafted for the 50 buses were much the same as for the 125, bids on which had been asked before.

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Extensive Bus Wheel Tests Being Made in Kansas City

Extensive tests on bus rear wheel combinations are being conducted by the Kansas City Railways, under the direction of R. W. Bailey, superintendent of power and equipment, and his assistant, F. C. Lynch. These tests are conducted in conjunction with representatives of many bus and equipment manufacturers who are interested.

The tests began April 23 and will probably last two weeks or more. They are open to all representatives of bus and equipment manufacturers. At the beginning of the second week of the test, 39 representatives of the leading bus and equipment manufacturers were represented.

In order to obtain basic data and information on the question of heat developed in regular operation, tests were made on several buses both of single and double deck type, taken out of regular operation. These buses were run in a specified manner over a test route of 2.8 miles per round trip. Two thermocouples were placed in each rear wheel, one between the tire bead and the rim and the other on the brake drum itself. Many combinations of tires and wheels of different types and sizes and different brakes and brake linings were tested. Careful records were kept of the several combinations and the results obtained. Tests were run until the temperature noted became constant. An electric potentiometer was placed in a small building at one end of the test run and readings were made at the end of each round trip.

These tests bid fair to give the industry important data that may result in the establishment of certain factors necessary to design a proper combination of wheel types and sizes, tires, drums, brakes and axles that will diminish certain difficulties that have developed.

Results of the tests will be assembled in a report after they have been completed. Data of interest to readers of the JOURNAL will be published in a future issue.

Thirteen equipment manufacturing companies in addition to the railway are participating in the tests.

Rolling Stock

Montreal Tramways, Montreal, Que., will obtain delivery in June of 50 one-man, two-man double-truck safety cars which were ordered from Canadian Car & Foundry Company in December, 1925, The cars are semi-steel in construction and have a seating capacity of 40. Principal specifications are given here:

Weights:	
Car body	15,200 lb.
Trucks	10,000 lb.
Equipment	8,800 lb.
Total	34,000 lb.
Bolster centers, length	17 ft. 7 in.
Length over all	41 ft. 2 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	10 ft. 10¾ in.
Body, wood	Semi-steel
Interior trim	Cherry
Headlining	Haskelite
Roof	Arch
Air brakes	Canadian Westinghouse
Armature bearings	Plain bronze, babbitt lined
Axles	4 in., 4¾ in. gear seat
Bumpers	Hedley 4-rib
Bumpers	Hedley 4-rib anti-climber
Car signal system	Faraday
Car trimmings	Bronze
Center and side bearings	Cast steel, friction type
Compressors	Westinghouse DH-16
Control	K-35 XB with Westinghouse 806-L line switch
Couplers	Montreal Tramways standard
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fare boxes	Cleveland
Wheelguards	H-B
Gears and pinions	Nuttall, helical ratio 13-69
Hand brakes	Peacock staffless
Heater equipment	Thermostatic control, 45 cars Consolidated, 5 cars Railway Utility
Journal bearings	3¾ in. x 7 in. standard
Journal boxes	Canadian Car & Foundry
Lightning arresters	Westinghouse MP
Motors	Four Westinghouse 510-A2, inside hung
Finish	Enamel
Sanders	Meissner's patent pneumatic
Sash fixtures	National Lock Washer
Seats	Ottawa Car Company
Seating material	Rattan
Slack adjuster	Westinghouse, Form E-1
Step treads	Kass
Trolley catchers	Keystone
Trolley base	Nuttall M-20
Trolley wheels	Ideal
Trucks	Canadian Car & Foundry
Ventilators	Railway Utility
Wheels	Cast iron, 26 in.
Special devices, etc.	Westinghouse variable load brake, Electric Service Supplies Company type K compensating lighting fixtures

Schenectady Railway, Schenectady, N. Y., has just received two Differential cars from the Differential Steel Car Company of Findlay, Ohio. These cars will be used principally for revenue purposes, such as hauling gravel for contractors.

Dallas Railway, Dallas, Tex., has just placed an order with the Differential Steel Car Company for a two-car Differential train. Each car will be equipped with G.E.-247 H motors and the control will be G.E. type M from one end.

Track and Line

Madison Railways, Madison, Wis., will rebuild and raise its track zone around the Capitol Square circle of four blocks in accordance with the city's new paving plans.

Key System Transit Company, Oakland, Cal., is planning to install new switches at Telegraph Avenue and Bancroft and at College Avenue and Dwight Way, in Berkeley, to provide a loop which would facilitate the handling of crowds for the University of California stadium. In addition the Spruce Street line would be extended Northward from Los Angeles Avenue to Regal Road.

New York, Westchester & Boston Railway, New York, N. Y., has awarded to Dwight F. Robinson & Company the contract for an extension of the New York, Westchester & Boston double-track electrically operated railway system from Mamaroneck to Hamilton, N. Y. Work on the construction of the extension will probably be begun immediately.

Los Angeles Railway, Los Angeles, Cal., will spend approximately $175,000 for its portion of the bridge and track changes on the Macy Street viaduct, opened on April 17.

Trade Notes

Ohio Brass Company, Mansfield, Ohio, moved its Chicago office on May 1 from 1217 to 1714 Fisher Building, 343 South Dearborn Street.

National Carbon Company, Inc., New York, N. Y., has taken over the plant inventory and good will of the Corliss Carbon Company. The combined National and Corliss lines now offer a complete assortment of brush grades to the market. A new finishing plant has been opened at Birmingham, Ala., to be used in supplying brushes throughout the Southern territory.

Cameron Electrical Manufacturing Company, Ansonia, Conn., manufacturer of commutators, announces the opening of a New York sales office in the Hudson Terminal Building, 50 Church Street, where in the future all inquiries or orders for its products will receive prompt and careful attention. The office will be under the management of E. G. Long Company, with which the Cameron company has been associated many years.

H. F. Darby, Jr., for more than twenty years with the Cutter Electrical & Manufacturing Company, Philadelphia, Pa., has resigned to organize a sales service for electrical and power machinery manufacturers. Mr. Darby states that he is about to visit manufacturing plants throughout the country and expects to establish headquarters in Philadelphia about June 1.

John T. Hogan was admitted to partnership in the firm of Parsons, Clapp, Brinckerhoff & Douglas, engineers, of New York, N. Y., on March 1, 1926. Mr. Hogan is a member of the American Society of Civil Engineers and was a director of that society from 1921 to 1923. He is also a member of the Society of American Military Engineers and served as lieutenant-colonel of engineers during the World War.

J. E. Rhodes, who has been identified with the electric railway industry for the last eighteen years and is a former official of the Irving S. Van Loan Corporation, has opened offices in the Times Building, New York City, under the name of the Electric Traction & Bus Company, to deal in high-class electric railway cars and equipment and to purchase entire railway properties.

New Advertising Literature

Armco Culver & Flume Manufacturers Association of Middletown, Ohio, has issued a pamphlet entitled "Increasing the Efficiency of Road Bed Drainage." The booklet provides a complete discussion of subdrainage with Armco perforated iron pipe, with particular reference to its advantages and application to railway work.

Reo Motor Car Company, Lansing, Mich., has issued a circular letter in which it lists the improvements which have been made in the third-year, model W, six-cylinder Reo bus. Among the points stressed are lower operating costs per mile, less time required for maintenance, easier operation, smoother running, additional energy available.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Better Maintenance on New Equipment

THROUGHOUT the electric railway industry there is evidence of growing interest in both the replacement of obsolete equipment and in the improvement of new car design. Numerous examples are available which demonstrate conclusively that new, lighter and more attractive cars may completely change the status of an electric railway property.

As interest in the substitution of modern for obsolete cars has increased, much has been said and written about the reduction in maintenance costs that results. Obviously this is an important advantage. But there is some danger of carrying the effort to reduce costs to an extreme. When new cars first replace old, dilapidated equipment the contrast is so marked and the effect on the shop so striking that there is a tendency to overlook the application of the adage "A stitch in time saves nine" to a new car as well as to an old one. Since at first so little maintenance attention is required on new cars in comparison with those that have seen better days, there is some tendency to neglect little, necessary, day-to-day repairs that are inevitable. It is a mistake to cut maintenance appropriations to a point where it is not possible to keep the cars in first-class condition.

Some examples are available of the need for better maintenance of new equipment. Unless adequate provision is made for taking care of the wear and tear from service as fast as it occurs even a new car soon begins to look dingy and down at the wheels. Eternal vigilance is the price of good-looking equipment. Unless this price is paid the depreciation process becomes cumulative and much of the value of the investment in new cars is lost.

Stream-Lining Shop Furniture

MOST electric railway shops build their own cabinets, closets, benches, material bins, racks, etc. The size, arrangement and design of these is usually left to the particular foreman who orders the piece of equipment. The result obtained is a conglomeration that cannot be arranged with any degree of uniformity. In addition to giving a bad appearance, the cost of construction is greater than it would be were a more uniform design used. This certainly is a fertile field for standardization, not only for the individual railway property but for the industry as a whole.

Many advantages not at once apparent have been found through standardization of such shop accessories by the Department of Street Railways, Detroit, Mich. By establishing a definite series of dimensions for cabinets and similar furniture, a new sketch or drawing is not required each time a new piece is to be made. When installed, the new equipment can be lined up with similar pieces already constructed, so as to give a uniform appearance. Steel construction reduces fire hazards, and for storage of most shop material is preferable to wood. This standardization has been extended to include boxes for scrap material, cans for oily waste, rags, etc., ovens for drying out wood stock and other parts that have a tendency to collect moisture in storage, stands for overhauling various equipment parts, paint and oil receptacles, storeroom bins and shelving, stock racks for convenience of overhauling crews and the usual types of closets and cabinets.

Other roads can well profit by a similar standardization of shop furniture, and no doubt the scheme of standardization might be extended to all railways, so that manufacturers would find it advantageous to take up the building of shop furniture as they now provide office furniture and so develop a line that could be used by all railway shops.

Close Machined Fits Will Reduce Maintenance Troubles

INCREASED attention now being given in various electric railway shops to more accurate machining of fitted parts is very encouraging, as sloppy fits have been considered the rule rather than the exception on electric railway properties. Manufacturers who are used to close machined fits have criticised the machining methods of electric railways as being responsible for many of the failures of equipment. There is no doubt that the extra care and cost necessary to produce close fits will be paid for several times over in longer service from wearing parts and decreases in trouble to equipment.

In the past, more attention has been given to fitting armature bearings to their shafts than at other points in the car equipment. The present standard plus allowance for armature bearing bores before bearings are pressed into housings is from 0.006 in. to 0.020 in., depending on the diameter of the axle. Bronze bearings will close in approximately 0.002 in. when forced into place. Many roads are now insisting on a maximum clearance over the shaft of not more than 0.006 in. for armature bearings after they are in place. These roads report very satisfactory results.

The usual practice in regard to axle bearings is to permit a considerably greater initial clearance than for armature bearings. Limits of from 0.015 in. to 0.017 in. have been considered good practice. Much less attention is also given axle bearings to determine wear after they are placed in service, and often they

This is the issue in May that is devoted essentially to maintenance subjects

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are continued in operation with entirely too great wear. There is no reason why closer fits cannot be used, and certainly more careful attention should be given to determine just what the wear is and to remove the bearings before excessive clearance results.

There are many other points in the car equipment where closer fits will prove of advantage. Journal bearings, journal bearing wedges, journal boxes and their guides, pedestal gibs, truck bolster chafing plates and the various fulcrum points for brake levers are some truck parts that should be watched carefully. Master mechanics should get behind the movement for more accurate machining in electric railway shops and show the managements that this is one way of reducing maintenance costs and preventing trouble. The results obtained will later prove an excellent example of the desirability of modern machine tools to produce more accurate machining.

Public Preference Must Receive Consideration

OPERATION of buses by the New Haven Railroad between Providence and Boston is objected to by H. C. Attwill, chairman of the Massachusetts Department of Public Utilities, principally because he believes that it would constitute an unwise duplication of facilities. His opinion, dissenting from that of the commission as a whole, is given in greater detail in the news pages of this issue. It is more economical, he says, to carry 70 passengers by rail than to carry 35 by rail and 35 by bus. That "there are those who prefer to ride in buses rather than on rails" is not a sufficient reason, to his way of thinking, to grant a certificate of convenience and necessity.

While this reasoning may be theoretically sound, it does not work out well in practice nowadays. It is futile to suppose that people who want to ride in automotive vehicles can be made to ride on rails by refusing permits for bus operation. They have their own private automobiles. Moreover, in this particular case competition from independent bus operators already has been established through the lack of interstate regulation. Denying the railroad the right to operate buses would not greatly increase the rail traffic, but would simply throw this business to the railroad's competitors.

Regulatory bodies can be of inestimable value to the public by protecting the established transportation agencies from the inroads of such competitors as tend merely to destroy a service which they are unable to replace. On the other hand, if the people who want some new type of transportation are willing to pay for it, and if the established agency is willing to furnish the service, it is better to recognize this public preference than to try to compel everybody to use some particular means. The *reductio ad absurdum* of that argument would be to make all steam railroad passengers ride in day coaches because they can be carried more economically that way than in Pullman cars.

Duplication of the local facilities of the electric railways is a more serious objection to bus operation by steam railroads. It would be most unfortunate if, as Mr. Attwill fears, such operation should develop into a fight for local traffic. By an agreement that the steam railroad buses shall not carry passengers between the points served by the electric lines that outcome usually can be avoided.

Make Shop Cleaning a Continuous Performance Instead of an Annual Affair

SPRING house cleaning, clean-up week in our cities and the inspiring freshness of new vegetation serve as excellent examples of the beneficial effects of clean surroundings. Much dirty work must be done in electric railway shops, but that is no reason why dirt and disorder should continue to exist. Cleanliness increases production, helps to produce better work and makes the workmen more contented. Many electric railways institute a spring cleaning campaign annually and good results are obtained. Why not continue to stress the need for cleaning up daily? Employees will take more pride in their work and will be more willing to broadcast the fact that they work for the railway if the shops are made something to be proud of.

One of the most impressive things noted by the members of the equipment committee of the American Electric Railway Engineering Association in their recent trip through the River Rouge plant of the Ford Motor Company at Detroit was the cleanliness of everything. The weather on that particular day was foggy and rainy and of a kind to produce a depressing effect, but the constant attention given to cleanliness in the yards and buildings made all parts inviting. The pleasing effect was commented on by several of the members of the party, and all went back to their respective railway properties with an inspiring example of the beneficial effect of cleanliness.

There is an old saying, "it is better to wear out than to rust out." Dirt causes disorders and may cover up defects. A layer of rust may do more damage than a year of wear, and the success of a property is most often judged by the appearance of its buildings, shops and equipment. Put on a bold front and make your railway property attractive by continual cleaning.

Maintenance Departments Demand First Consideration

GENERAL managers of electric railways, if they give the subject of maintenance sufficient thought, cannot fail to realize that it constitutes the foundation for the most effective methods of merchandising transportation. Not only is it essential that cars be kept on the road, but, also that they present an attractive appearance, be free from annoying delays to service and provide conveniences that passengers expect. The various maintenance departments are vital factors in the success of any railway property.

Many electric railways are laboring under severe handicaps due to unattractiveness of their cars, frequent breakdowns which upset schedules, and lack of properly maintained tracks or lines. A passenger on one of the electric cars in a Mid-Western city was recently heard to remark: "I wish they would take off these old cars and give us buses." When pressed for a reason for the remark, he volunteered: "Those new interurban buses are far more comfortable and attractive than the street cars, make better speed and are reliable." Modern cars properly maintained will do away with most complaints of that nature. New, up-to-date cars, however, will not long continue to please unless a high grade of maintenance keeps them free from troubles.

Cars do not produce revenue while in the shops for repairs. Every additional minute that a car is withheld from service means just so much loss. It is, there-

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fore, most essential that the organization and tools provided for making repairs be kept at their highest state of efficiency and that the most modern tools be provided. A large number of machine tools may not be needed, but care should be used in their selection and arrangement so that the maintenance work can be done most efficiently.

Maintenance departments have not been given the consideration that they merit and have not received their share of funds with which to carry on properly. For attraction of increased riding, electric railways must establish service on a solid foundation, and that requires better shops, better machine tools, better material to work with and better wages for the maintenance force.

Clear Thinking and Lots of It Should Be the Keynote of Conventions

DIRECT concern to those in the electric railway industry was seen in a note sounded at the Galveston meeting of the Southwestern Public Service Association last month. Just as the meetings of a few years ago were maintenance talks, today they are not only that but much more. In fact, the burden is becoming heavy indeed and the problems to be studied require the careful consideration of operators and manufacturers as well. The service of ten years hence will require facilities and methods perhaps unknown today. This is a job for the manufacturer as much as for the operator. The manufacturers must lead in adapting new principles to products. They cannot afford to sit back and try to sell antiquated equipment nor wait to have the operator design his own product. Operators are not necessarily the best designers and should not be called on so to diversify their energy.

All this calls for a more serious consideration of the discussions of papers presented at meetings and conventions. The industry is moving rapidly and often through dangerous channels.

This is not a passing editorial fancy, but a thought that is having the earnest attention of important executives. The time is here that this question should be faced squarely to the end that railway meetings may be even more productive of progress than they are today. Hilarity and entertainment have their place, but today clear thinking and lots of it are the prime necessities.

Special Remuneration Often Leads to Stimulated Brain Action

VERBAL pyrotechnics may play a part in encouraging railway employees to apply a little gray matter to the subject of the company's welfare, but a suggestion of special remuneration cannot have other than a stimulating effect in backing up the talk. Hence the instant appeal provided by the "Suggestion Department" of the Pittsburgh Railways. All suggestions, both great and small, are carefully reviewed by the company, judged upon their respective merits and duly rewarded by suitable sums ranging from $5 to $75.

Employees have been quick to seize upon this opportunity of capitalizing on the ideas which crop up from time to time, even in the minds of the most mechanized of humans. These suggestions, not being limited to any particular field of railway activity, are offered by employees in every branch of the organization, and vary from the highly valuable to the utterly worthless in character. However, even should it require an average of ten worthless ideas to produce one real money maker or saver, who shall say that the end was not worthy of the means?

College professors are expected to maintain their prestige by the writing of frequent papers and books along the lines of their chosen subjects. Similarly, master mechanics who are ever on the outlook for methods of simplifying and cheapening maintenance work will stand high in the estimation of their company executives. Since they cannot themselves hope to devote sufficient time to accomplish the whole task, they must rely on their subordinates to provide usable suggestions. The suggestion department perhaps may be said to attain its ultimate of usefulness among the shop workers. A practical example of the functioning of this plan is detailed elsewhere in this issue.

Too Much of a Bad Thing at Akron

ECONOMIC waste has run high in Akron, Ohio, as a result of interruptions to its transportation service through strikes there in the last fifteen years. Statisticians would be required to count the cost to the local railway, the merchants and employees of the railway and other workers, to say nothing of the untold inconvenience inflicted on the residents of the city. These strikes have lasted from one to eleven days. Each time the result has been the same so far as the company is concerned—a settlement at the railway's expense with labor less amenable to discipline than before.

The record of events at Akron in these controversies may differ in its details from similar records elsewhere, but the story of union usurpation is very much the same everywhere in this industry. Always there has been the same disposition on the part of labor to go to the extreme by insisting on having its way about petty details. Of course, the question of an increase in wages —one of the issues in the present controversy—is not a petty detail either to the men or the company, but that of union insistence that the company deprive men who did not pay their union dues of their seniority, however much the union might like to magnify its importance, is a detail too petty to be made a basis for calling a strike. This last is an old issue in the history of union activity. It probably was not so much either of these issues as the summary way in which this latest strike was inflicted that prompted the Akron company to make a determined stand against the union. In this case the old union argument does not hold that any temporizing by it fortifies the opposition in its position by making it possible for the company to prepare adequately to give battle.

Sympathy with labor, particularly in a city like Akron, is not usually slow to assert itself. Yet in this instance the public has been apathetic. It is apathetic because it has been fed up on this sort of thing and because it has appraised the issues correctly—issues that have been clearly stated in the JOURNAL. The story makes interesting reading, particularly that part of it which has to do with the conditions under which service is being restored. When all things are considered, and with due respect to the company, the wonder is not so much that it was decided in this instance to see the issue through but that the company went so far as it did in its effort amicably to reach a settlement.

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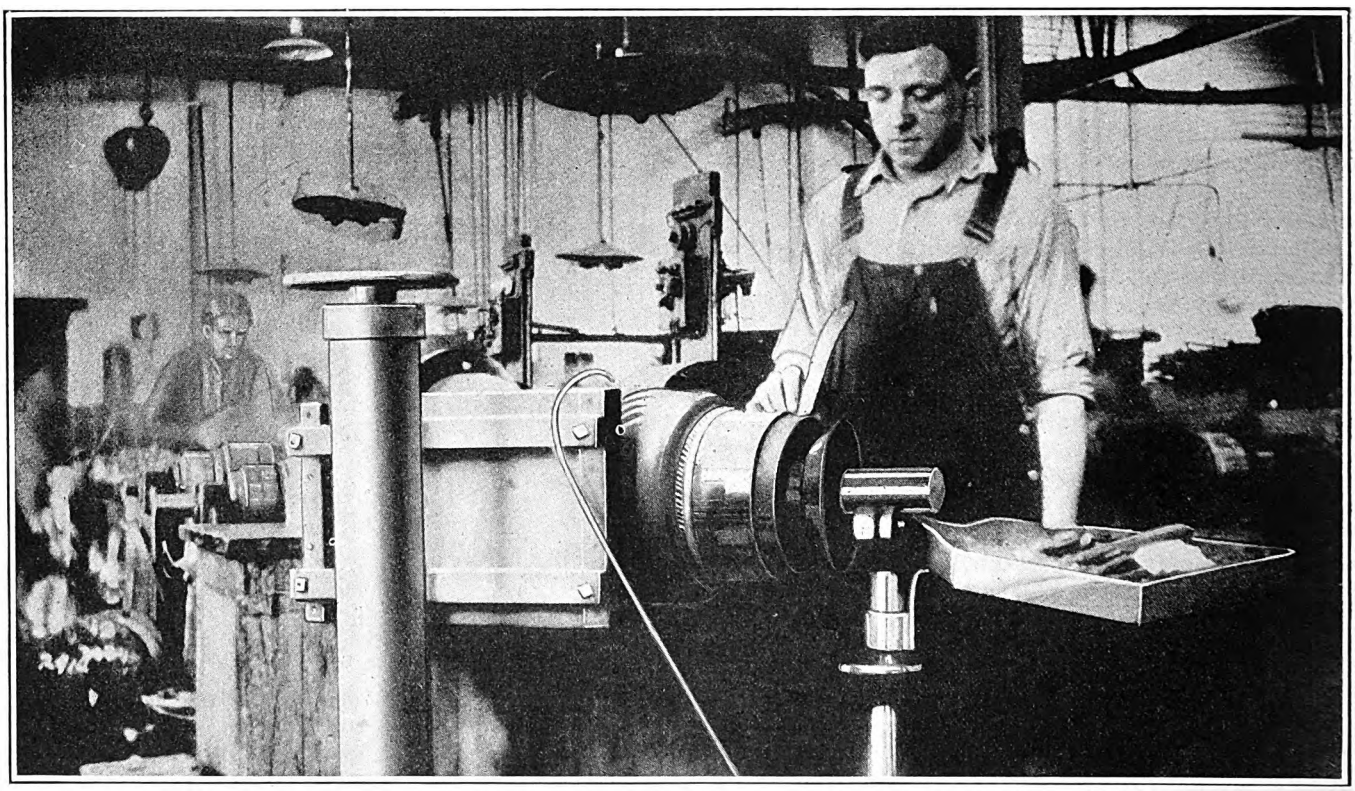
Improved Testing Decreases Armature Open Circuits

The Difficult Problem of Locating Partial Open Circuits in Armatures so that Repairs Can Be Made Before a Total Open Circuit Results Has Been Brought Nearer to a Solution in Chicago by Improved Testing Methods—Of Three Methods, Measurement of Coil Resistance with a Wheatstone Bridge Has Been Found Most Reliable

By W. C. Wheeler
Engineer of Equipment Chicago Surface Lines, Chicago, Ill.



Transformer Test Provides an Alternating Field in Which the Armature Is Placed to Develop an Alternating Emf. in the Coils. A Piece of Metal Bridges Adjacent Commutator Bars

DUE to the characteristics of railway motors, an open circuit in the armature windings will in time cause flashing and consequent arcing and burning of the commutator. This necessitates removal and repairs to the armature and winding. Some railway men believe that open circuits are caused by vibration of the coil structure, which stresses the lead where it enters the commutator ear, and in time results in a fatigue break. Others hold that the crystallization of hard copper causes opens, or that the so-called bucking of the motors during emergency stops is a contributory factor.

Whatever the cause, it is well known that some armatures are more prone to develop open circuits than others. This may be inherent to the design or other causes which are met with in operation. It has been noted that some armatures will not have an open circuit for years and will then become persistent offenders, or repeaters. Observations made also would indicate that the formation of an open circuit in a winding may be a gradual process and that an armature may run for some time with a great many leads practically open. On the Chicago Surface Lines armatures have been found operating with ten to twenty opens and one armature which was sent in for repairs due to damage caused by one open circuit was found to have 51 top leads broken.

Taking these points into consideration the testing of armatures when they are repaired becomes very important. If potential opens can be located while the armature is undergoing repairs, they can also be repaired and the armature will remain in service for a considerably longer time than would be possible had it been allowed to return to service with one or more leads half broken or wholly broken in two but still in contact.

In the development of testing methods for open circuits by the armature repair department of the Chicago Surface Lines three electrical methods have been introduced at different times, all of which have been used in connection with a mechanical test of each lead with a

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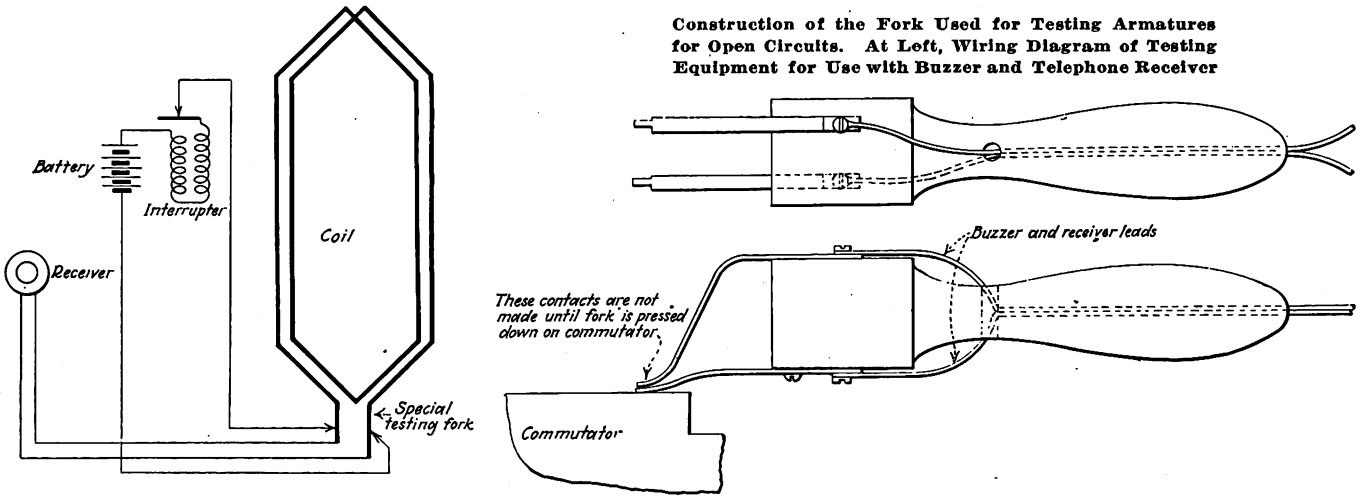
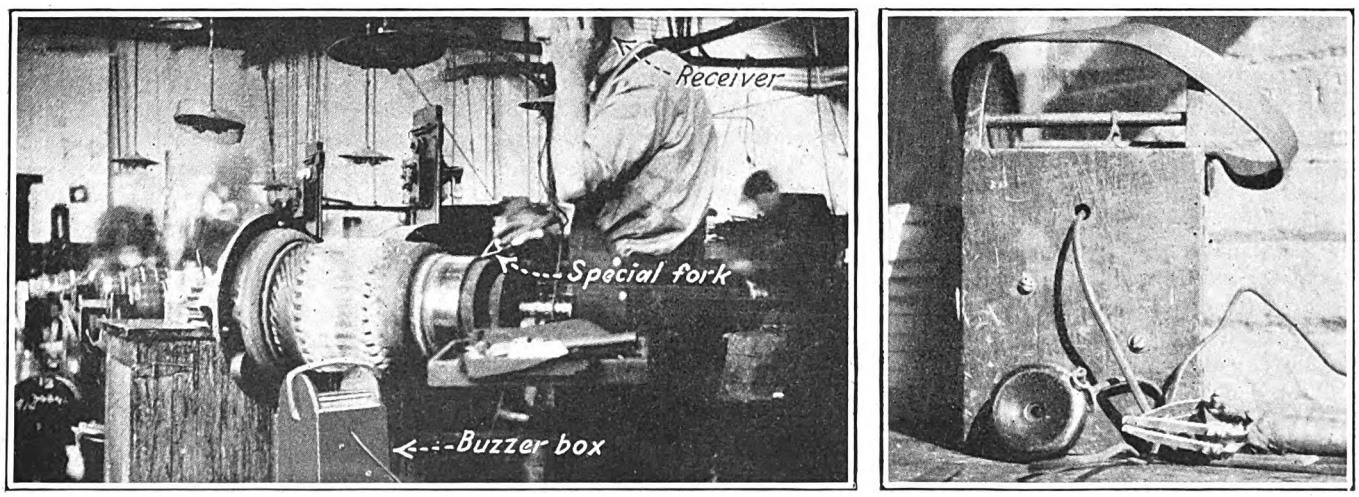


Construction of the Fork Used for Testing Armatures for Open Circuits. At Left, Wiring Diagram of Testing Equipment for Use with Buzzer and Telephone Receiver

small metal rod which is used to pry up any leads that are not securely fastened. Obviously this mechanical test can be used only on top leads and will locate only leads that are wholly broken in two, but the ends of which may still be in such close contact that they have not caused trouble.

The first electrical method introduced was that of a simple transformer test. The apparatus used is shown in an accompanying illustration. In this test a pole piece is mounted on a movable and adjustable stand and a coil is placed around the pole piece and is connected to an alternating current supply. When this stand is so placed that the armature is in the alternating field produced by the coil, the armature coils within the influence of this field have an alternating electromotive-force developed in them. If a piece of metal is used to short two commutator bars to which one of the energized coils is attached sparking will occur at the bars. The presence of this sparking is taken to indicate that the coil is in good shape. However, due to the character of the winding in most railway motor armatures, it is necessary to have two opens in separate coils to prevent the occurrence of a spark at the commutator under the above conditions. This condition would allow armatures to be passed as being O.K., when they actually contained real opens. After being in service a short time they would develop trouble and have to be returned for repairs. Thus an armature which would have been repaired if it had been properly tested might become a repeater because the open was not found when the armature was tested before leaving the repair department.

The second electrical method made use of an intermittent current which was passed through two parallel circuits, one of which was the armature coil under test and the other a low resistance telephone receiver. The intermittent current is supplied from a dry battery as a primary source through a buzzer. Connections are made through a four-pronged fork so that the buzzer operates only when the fork is pressed on the commutator bars. The buzzer and battery are conveniently mounted in a box. This test requires a bar-to-bar test on the commutator, the condition of the coil being indicated by the intensity of sound in the receiver. It will be seen from the wiring diagram shown for this test that when the connections at the commutator ears are in good shape and the coil is not open that due to its low resistance the greater portion of the current passes through the coil and only a small amount through the telephone receiver. If the connections are poor or the coil partly open a greater amount of current passes through the receiver, and if the coil is open all the current passes through the receiver, producing a loud sound. Thus the intensity of the sound in the receiver is an indication of the condition of the coil. An experienced operator can detect coils that are not sufficiently open to cause trouble, but which soon will break down. This test is very simple to install and cheap to operate. It is



At Left, An Intermittent Current Supplied from a Dry Battery Is Passed Through a Buzzer. A Telephone Receiver Is Used to Approximate the Resistance by the Volume of Sound Produced. At Right, Buzzer Box Showing the Receiver and Special Testing Fork Used

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superior to the first method in effectiveness, although shop noises are a disadvantage in its use. If the buzzer is wrapped in felt or other sound-insulating material and installed inside the box without rigid fastening its sound is muffled and there is less chance of confusing it with the sound heard in the receiver.

WHEATSTONE BRIDGE METHOD MOST ACCURATE

The third and latest electrical test used in the Chicago shops is by far the most accurate and reliable test devised so far. It also is the most expensive to install and operate. This test makes use of a Wheatstone bridge for measurement of the electrical resistance of each individual circuit in the armature by a bar-to-bar test. Two men are required to make the test. A Leeds & Northrup Wheatstone bridge is used. This instrument is provided with a dial on which resistance from 0 to 100 ohms may be read directly. Provision is made for use up to 1,000,000 ohms by use of multipliers contained within the instrument. It is very handy for other resistance measurements, but particularly so for testing armatures.

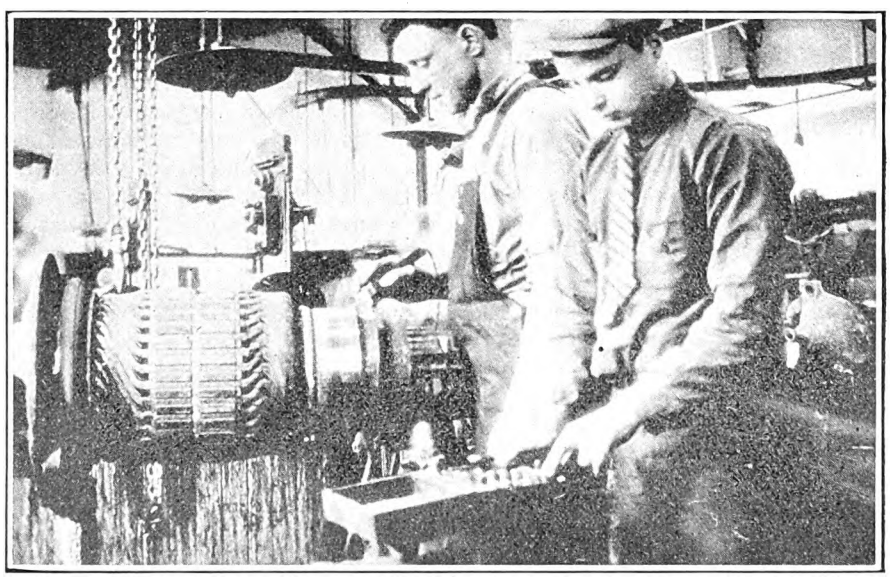
A fork is used with this instrument, which is similar to the one used in the second method of testing except that it has only two prongs. In making the test contact is made with the fork on two adjacent commutator bars and the dial is adjusted until the galvanometer comes to rest. On the common sizes of street railway motors this value is in the order of 0.14 to 0.25 ohms, including the low resistance leads from the instrument.

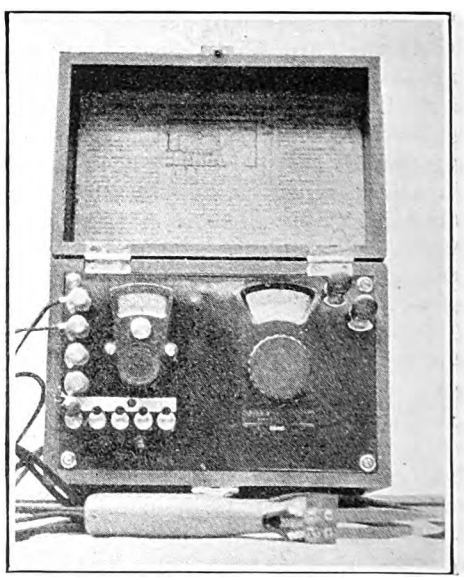
After the position of the dial has been determined for the armature it is only necessary to watch the galvanometer as the fork is passed from bar to bar around the armature. It is necessary to pause on each bar long enough for the galvanometer to come to rest, as the movement from one bar to another usually causes a slight deflection.

If the armature is in good condition the galvanometer will register the same for all the bars. If, however, there is a poor connection to the commutator or if the cross-section of the wire has been materially reduced at any point, such as would be the case had a break started, the galvanometer would deflect to one side, indicating that the resistance between these two bars was higher than normal. It has been found that a deflection of three points on the galvanometer scale will indicate a partial open circuit or a poor joint at the commutator ear. A deflection of five points usually indicates a clean break, while with any deflection of from three to ten points the ends of the leads may be found in contact, but the wire broken completely.

Very satisfactory results have been obtained with the last method of testing, and in comparative tests open circuits have been found with it that were not located in other ways. This test is given all armatures just before they are returned to service, as it has been found that in some cases opens will become evident during the dipping and baking process that could not be located before. The test is also used while the armature is being repaired so that all opens found may be repaired at one time.

It is felt that this practice makes for armatures that are in the best possible condition when they leave the repair department, in that they have been cleared of the potential opens or partial breaks in the leads and that consequently they will remain in service for longer periods before failure.





At Left, Electrical Resistance Measured by a Wheatstone Bridge Has Been Found the Most Accurate and Reliable Test for Open Circuits. At Right, the Instrument Used for Measuring Resistance Is a Leeds & Northrup Wheatstone Bridge Ohmmeter

Although this method of testing was in service for only about six months of last year, the total number of armatures repaired on account of open circuits during the year was 12 per cent less than those repaired for the same cause during the preceding year.

The Leeds & Northrup instrument for the improved test costs more than other testing equipment that has been used, but the money is well invested when the amount of labor and time saved are taken into consideration. This instrument has a decided advantage over the millivoltmeter method in use in some shops for it is self-contained and easily transported to any point in the shop. The instrument will also be found particularly useful for making other electrical tests on car equipment. On small properties, where continual use in the armature repair department is unnecessary, such an instrument can be used to good advantage for locating poor contacts or open circuits in the car wiring and for testing complete motor connections after assembly.

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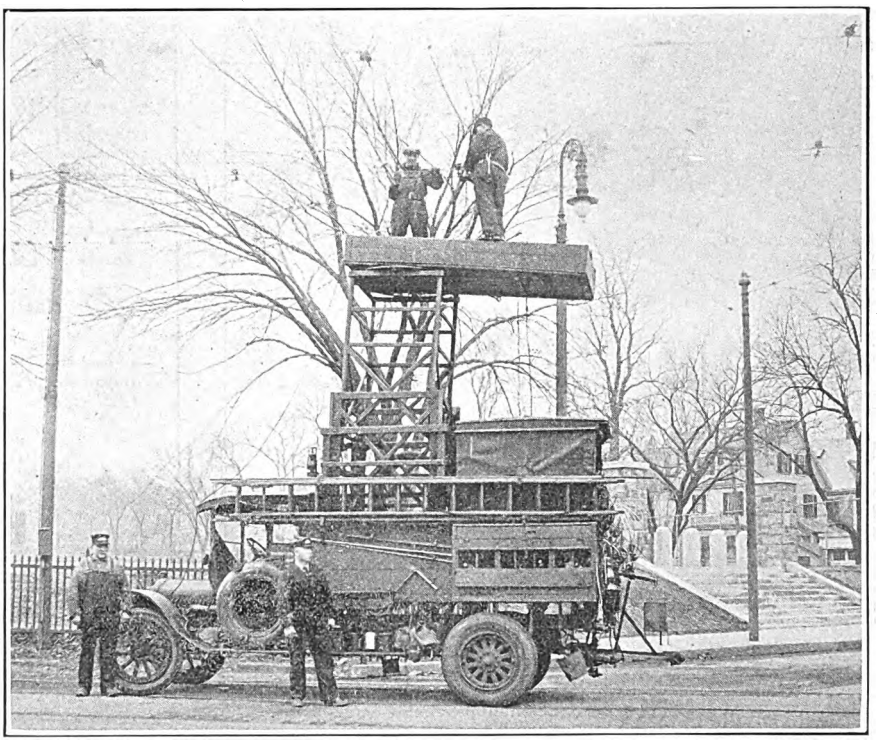
Trolley Wire Breaks Reduced 43 per Cent in Boston

Inspections Are Now Made Regularly on Basis of Number of Wheel Passes—Operating Data Are Furnished by Transportation Department—Many Interruptions to Service Have Been Prevented and Line Maintenance Costs Reduced

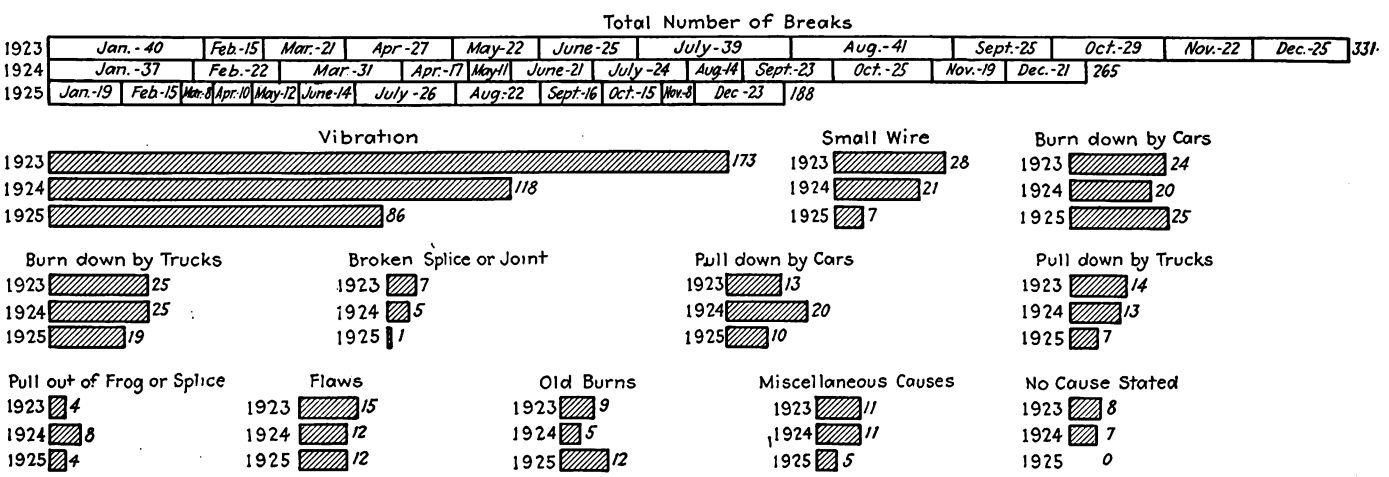
USE rather than the mere passage of time has been made the basis of inspecting overhead wires on the Boston Elevated Railway system. Previously it was the practice to make such inspections about once in four months regardless of the wear on the wire during this period. It was felt by J. P. Boyden, superintendent of wires, that this method was unsatisfactory because of the difference in the wear on various sections. For example, in the Tremont Street subway there are 2,295 trolley wheel passes per day, while on some of the outlying lines the number is as low as 61. The basis was changed, therefore, so that inspections are now made on a basis of 200,000 trolley wheel passes. This has effected a reduction of 43 per cent in wire breaks and a corresponding decrease in line maintenance costs.



Line Crew and Tower Truck of Boston Elevated Railway Engaged on Periodic Ear Renewal Work

In 1923 under the old system there were 331 trolley wire breaks. During 1924, the transition period from the old to the new system, there were 265 breaks. In 1925, with the new inspection method in effect throughout the year, there were only 188 breaks. The record for these three years is shown graphically in an accompanying chart. Totals are subdivided according to months and also according to causes of breaks. The latter classification is based on reports made by the foremen of repair crews on the form which is reproduced on another page.

As an aid to the line department, the time-table department has prepared a map showing the daily number of car passes on all lines of the Elevated system. Where the service is more frequent than 300 cars per day or where vehicular traffic is particularly heavy inspection of overhead wires is done at night. This trolley wheel pass map is shown in an accompanying illustration, the day and night inspection lines being



Record of Trolley Wire Breaks for Past Three Years Shows Steady Improvement

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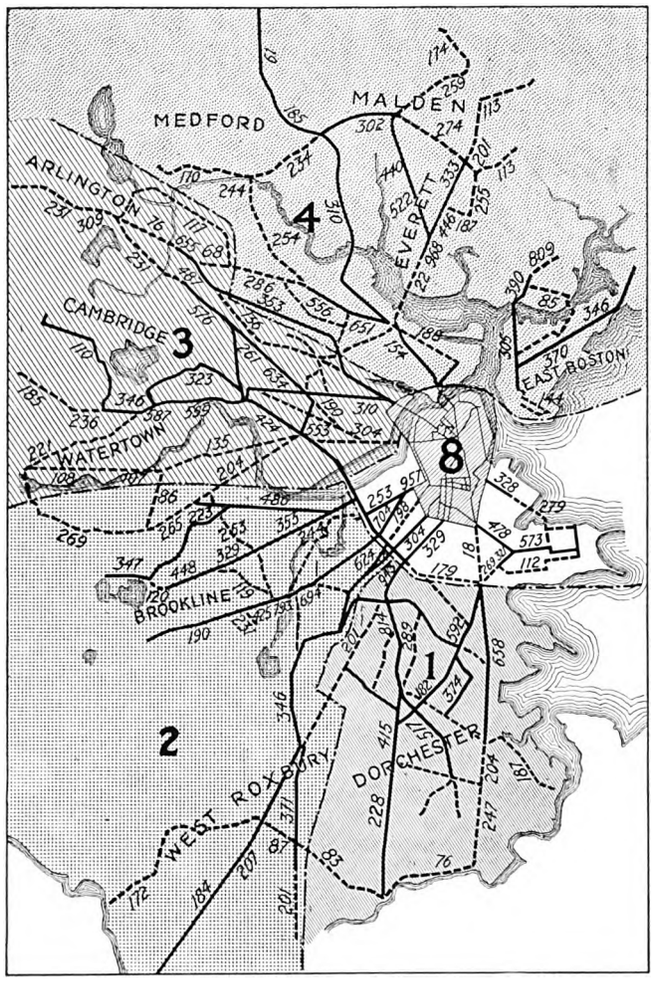
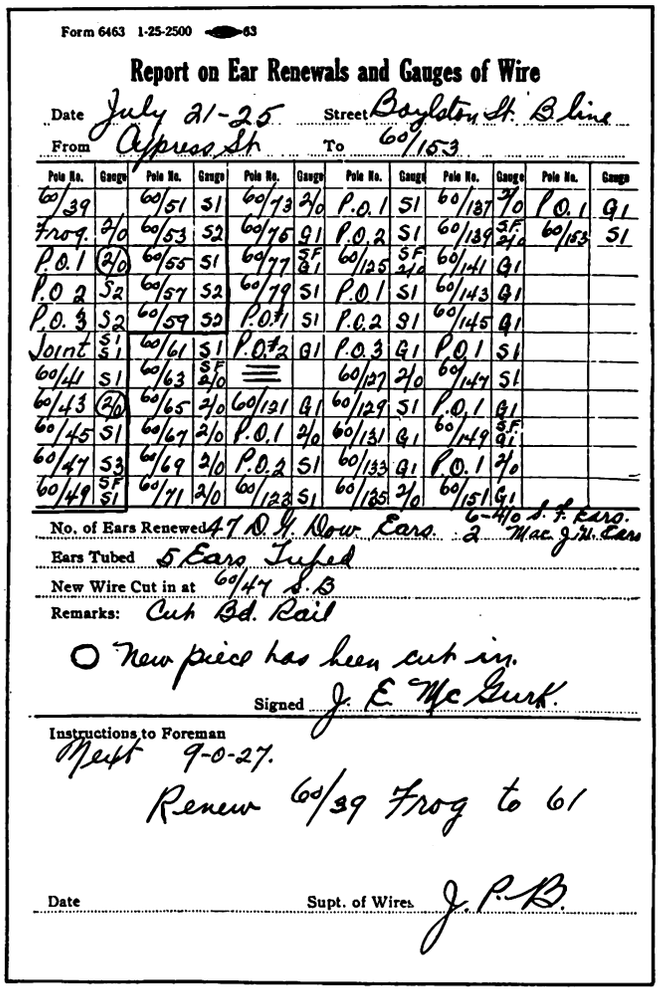


System Map Showing Daily Number of Trolley Wheel Passes

Solid lines indicate routes where inspections are made at night; dotted lines are day inspection routes. Divisions correspond to the operating divisions of transportation department except that the downtown area is handled separately and retains its former designation, "Division 8." This comprises the shaded and unshaded areas in the central part of the city. All work in the shaded area is done by night crews.



Form 6463 1-25-2500 63

Report on Ear Renewals and Gauges of Wire

Date July 21-25 Street Boylston St. B line

From Cypress St To 60/153

Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge	Pole No.	Gauge
60/39		60/51	S1	60/73	2/0	P.O.1	S1	60/137	2/0	P.O.1	G1
Frog.	2/0	60/53	S2	60/75	G1	P.O.2	S1	60/139	SF 2/0	60/153	S1
P.O.1	(2/0)	60/55	S1	60/77	SF G1	60/125	SF 2/0	60/141	G1		
P.O.2	S2	60/57	S2	60/79	S1	P.O.1	S1	60/143	G1		
P.O.3	S2	60/59	S2	P.O.#1	S1	P.O.2	S1	60/145	G1		
Joint	S1 S1	60/61	S1	P.O.#2	G1	P.O.3	G1	P.O.1	S1		
60/41	S1	60/63	SF 2/0	≡		60/127	2/0	60/147	S1		
60/43	(2/0)	60/65	2/0	60/121	G1	60/129	S1	P.O.1	G1		
60/45	S1	60/67	2/0	P.O.1	2/0	60/131	G1	60/149	SF G1		
60/47	S3	60/69	2/0	P.O.2	S1	60/133	G1	P.O.1	2/0		
60/49	SF S1	60/71	2/0	60/123	S1	60/135	2/0	60/151	G1		

No. of Ears Renewed 47 D.G. Dow Ears. 6-4/0 S.F. Ears. 2 Mac. J.H. Ears

Ears Tubed 5 Ears Tubed

New Wire Cut in at 60/47 S.B

Remarks: Cut Bd. Rail

O New piece has been cut in.

Signed J. E. McGurk.

Instructions to Foreman

Next 9-0-27.

Renew 60/39 Frog to 61

Date Supt. of Wires J. P. B.

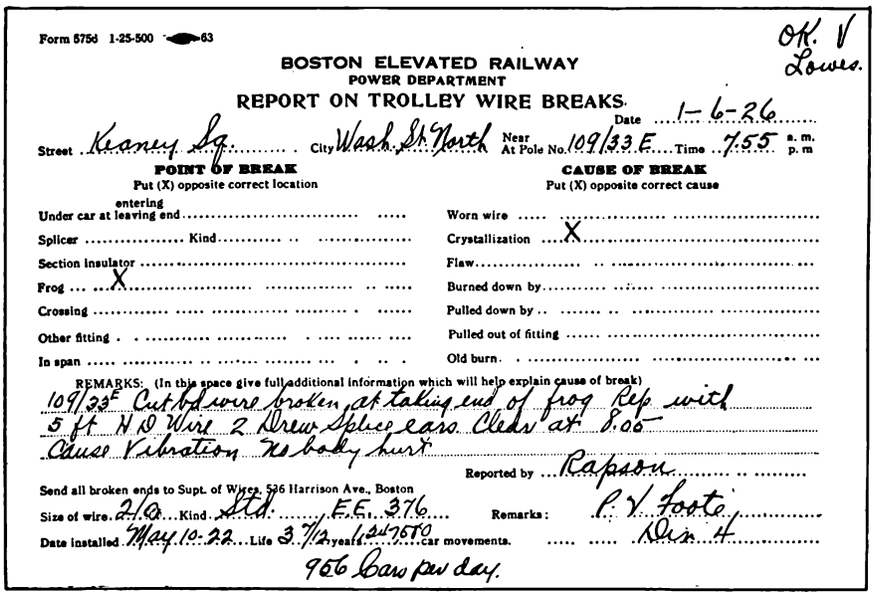
Form Used to Show Condition at Inspections

Note—*G1* denotes gage 1, etc. *S1* denotes slack gage 1; this is between gage 1 and gage 2. *SF* denotes side feed ear.

distinguished by different symbols. All work in the congested downtown district is done by the night crews. New maps are prepared from time to time by the timetable department when rerouting or other changes cause a substantial alteration in the amount of service operated. Small schedule changes are believed to be unimportant from the viewpoint of the line department and no attention is paid to them.

Renewing of ears and gaging of wire are done at the same time. A program of ear renewal was begun in the spring of 1924, reports being made on a form which is reproduced herewith. Ears are removed as soon as the lips are worn down so that the trolley wheels are running on the wire, as it is thought to be cheaper to renew ears than to renew wire.

At the same time that the ears are inspected the diameter of the wire is measured. The wire generally used on the Boston Elevated system is size No. 00. When it has been worn down to No. 3 B. & S. gage it is renewed. Outdoor overhead wire has been found to have a life of about 1,000,000 wheel passes, while in the subway the average life is about 2,000,000 passes. The longer life in the subway is attributable, it is thought, to closer spacing of supports and greater tension in the wire itself. Ears have been found to have an average useful life of



Form 5756 1-25-500 63

OK. V Lowes.

BOSTON ELEVATED RAILWAY
POWER DEPARTMENT
REPORT ON TROLLEY WIRE BREAKS

Date 1-6-26

Street Keaney Sq. City Wash. St. North Near At Pole No. 109/33 E Time 7.55 a.m. p.m.

POINT OF BREAK Put (X) opposite correct location		CAUSE OF BREAK Put (X) opposite correct cause	
Under car at leaving end entering		Worn wire	
Splicer	Kind	Crystallization	X
Section insulator		Flaw	
Frog	X	Burned down by	
Crossing		Pulled down by	
Other fitting		Pulled out of fitting	
In span		Old burn	

REMARKS: (In this space give full additional information which will help explain cause of break)
109/33E Cut bd wire broken at taking end of frog Rep with 5 ft H D Wire 2 Drew Splice ears Clear at 8.05 Cause Vibration No body hurt

Reported by Rapson

Send all broken ends to Supt. of Wires, 526 Harrison Ave., Boston

Size of wire 2/0 Kind Std. E.E. 376 Remarks: P. V. Foote

Date installed May 10-22 Life 3 7/12 years 1,247,580 car movements. Div. 4

956 Cars per day.

Form Used to Record Location and Cause of Trolley Wire Breaks

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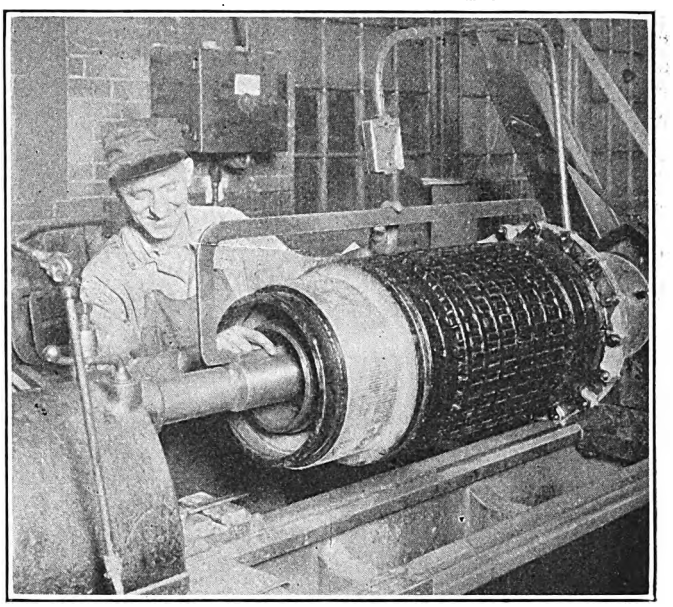
about 250,000 trolley wheel passes. Thus there is a safe margin between the 200,000 wheel pass inspection and the limit of wear of the ears.

A double card index is kept in the office of the superintendent of wires. Each section has a card on which is recorded the daily number of car passes and the dates of all previous inspections and renewals. A dated file is also kept showing the work done each day.

Two day crews and three night crews are employed on line maintenance work. Each crew consists of a foreman, a driver and two linemen. Four White trucks with McCardle towers are used, as well as two tower cars for work in the subway and on private right-of-way. Thus there are altogether six towers for the five crews. In addition the company has five emergency tower trucks. At times some of these in the outlying sections are used on maintenance work, but the downtown emergency is never used for any other purpose.



Measuring the Distance Between Wiper Faces of an Armature

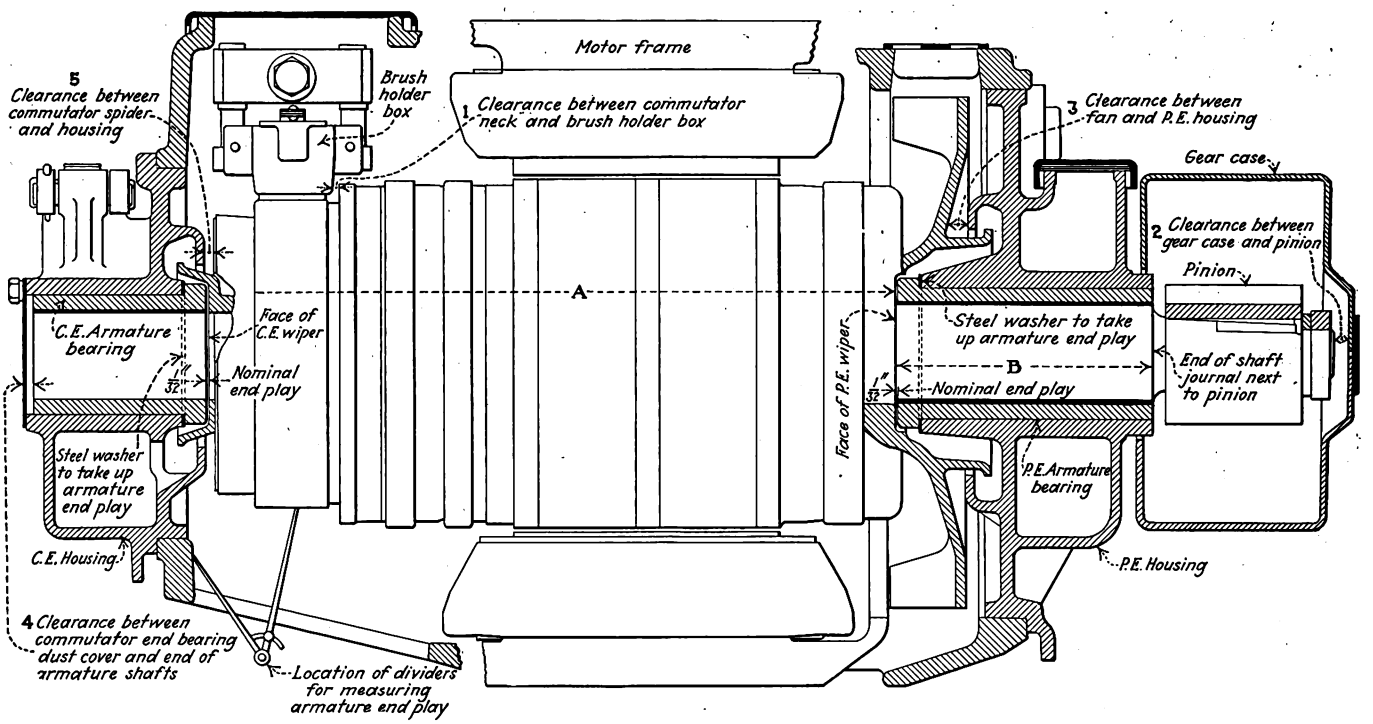
Compensating Armature End Play

Methods of Measuring and Compensating for Armature End Play Are Given, Together with the Solution of a Particular Problem

By Jesse M. Zimmerman
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Overhauled motors should not be put into service if the total armature end play is less than $\frac{1}{32}$ in. or more than $\frac{3}{32}$ in. The operator by careful study of each individual motor on his property can determine the maximum end play permissible for good operation. A simple method of measuring the end play of armatures as installed in their frames consists of moving the armature so that the pinion end wiper collar is against the armature bearing flange and then to prick punch a hole in the motor frame below the commutator. The various operations can best be followed by referring to the accompanying line cut. After prick punching, one point of a pair of dividers should be placed in this hole and a mark can be scratched on the commutator face with the other point. The armature should then be slid along so that the commutator end wiper collar is against the armature bearing flange. With the point of the dividers in the prick punch hole, another line can then be scribed on the commutator face. By measuring the distance between the two scribed lines, the total armature end play will be found.

Some general figures for armature end play should be of assistance. The end play for motors using gears with $3\frac{1}{2}$ to $4\frac{1}{4}$ diametral pitch should not exceed $\frac{3}{16}$ in., and the end play for motors using gears with $2\frac{1}{2}$ to 3 diametral pitch should not exceed $\frac{1}{4}$ in. Five particular clearance conditions should be taken into account on



Section of Railway Motor Showing How Armature End Play Can Be Determined

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every motor. These are not all limiting conditions, but should be considered when arriving at the absolute maximum end play. These conditions are designated in the longitudinal drawing of the motor illustrated. The clearances are (1) between the commutator neck and brush-holder, (2) between the pinion and the gear case, (3) between the fan and pinion end housing, (4) between the commutator end bearing dust cover and the end of the armature shaft, and (5) between the commutator spider and the commutator end housing.

STEEL WASHERS FOUND USEFUL TO TAKE UP END PLAY

Fiber washers slipped over the armature shaft have been used to take up the armature end play in railway motors, but this method has not given entire satisfaction. On some properties, grit became embedded in the fiber and this caused wear at the bearing flange. In some instances, where the fiber washers had been in service for only a few months, they were badly worn or had entirely disappeared. In order to overcome the difficulty experienced with fiber washers, many operators are now using 1/8-in. thick steel washers placed over the armature bearings between the flange and the housing hub.

EXAMPLE OF METHOD USED TO CALCULATE THICKNESS OF WASHERS NECESSARY TO TAKE UP ARMATURE END PLAY

[1]	
a. Wiper distance on new armature to be	22 11/16 in.
b. Wiper distance on old armature to be	22 5/8 in.
c. Total wear on wiper faces to be	1/16 in.
d. Measured dimension B	4 17/32 in.
Dimension B received from manufacturer	4 1/2 in.
e. Wear on P.E. wiper	1/32 in.
Since the total wiper face wear found in c is	1/16 in.
and the wear on the P.E. wiper is	1/32 in.
f. The wear on the C.E. wiper will be	1/32 in.
[2]	
New C. E. armature bearing flange	3/4 in.
Old C.E. armature bearing flange	21/32 in.
Wear on C.E. armature bearing flange	3/32 in.
C.E. wiper face wear	1/32 in.
Total end wear on the C.E. of the motor	1/8 in.
Therefore, two washers should be placed over the C.E. bearing	
[3]	
As in Par. 2, P.E. bearing flange wear	1/32 in.
P.E. wiper face wear	1/32 in.
Total wear on the P.E. of the motor	1/16 in.
Therefore, one washer should be placed over the P.E. bearing.	

It is necessary to know how many washers each 1/8 in. thick are to be placed over the armature bearing before it is pressed into the housing. This can be taken care of by obtaining from the manufacturer the distance (A) between wiper faces for a new armature and the distance (B) between the pinion end wiper face and the end of the shaft journal next to the pinion. The distance between wiper faces for the armature to be used should then be determined. A convenient method of measuring the distance (A) between wiper faces of an armature was described in ELECTRIC RAILWAY JOURNAL for May 9, 1925; this method being used in the Utica Park shops of the New York State Railways. A similar method is illustrated herewith. The difference between the dimensions given by the manufacturer for a new armature and that obtained by measuring the armature to be used will be the total wear on the wiper faces. By measuring the distance (B) from the pinion end wiper face to the end of the shaft journal next to the pinion and subtracting this from the original dimension, the wear on the pinion end wiper face will be obtained. This wear on the pinion end wiper face subtracted from the total wear will give the wear on the commutator end wiper face.

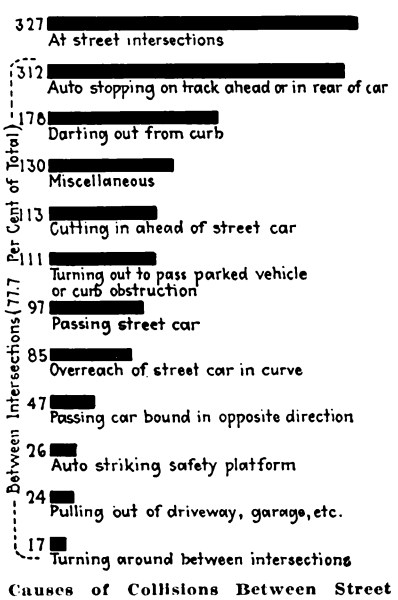
To find the wear on the commutator end bearing flange, add to this the wear on the commutator end wiper faces. This will be the thickness of the washers necessary to place over the commutator end armature bearing. The wear on the pinion end bearing flange can be found by adding to this wear the pinion end wiper face. This will be the thickness of the washers necessary to be placed over the pinion end of the armature bearing. In order to illustrate the various steps as just given, a practical example is worked out in the accompanying table.

In the example given in the table, it is not necessary to account for the allowable end play since the motor was designed for 1/8 in. total end play. Therefore, by using the design values for wiper face, end distance and bearing flange width the same end play should be obtained.

It is necessary that the bearing flange be pressed tight against the housing hub to insure sufficient end play, and in applying washers care should be taken to make sure that the commutator neck does not strike the brush-holder.

Traffic Accident Causes Analyzed at Grand Rapids

AN ANALYSIS of the causes of automobile accidents in 1925, recently issued by the department of public safety, Grand Rapids, Mich., shows that of 11,574 vehicles involved, 8,582 were private automobiles, 1,313 were street cars, 883 were heavy commercial automobiles, 210 were light commercial, 203 were automobiles of other types, 149 were bicycles, 118 were taxicabs, 58 were motorcycles and 47 were passenger buses. Altogether there were 5,996 accidents. Of this number 3,826 were collisions between motor vehicles and 1,313 were collisions between automobiles and street cars. It was found that 86 per cent of the collisions between automobiles occurred at street intersections, while 78½ per cent of those between trolleys and automobiles occurred in the middle of the block. Pulling away from curbs, trying to get ahead of street cars through narrow spaces, stopping suddenly in front of cars or failure to notice the stopping of cars were the reasons for most of these accidents. A graphic comparison of the number of street car-automobile collisions resulting from each of these causes is given in an accompanying chart.



Causes of Collisions Between Street Cars and Automobiles in Grand Rapids

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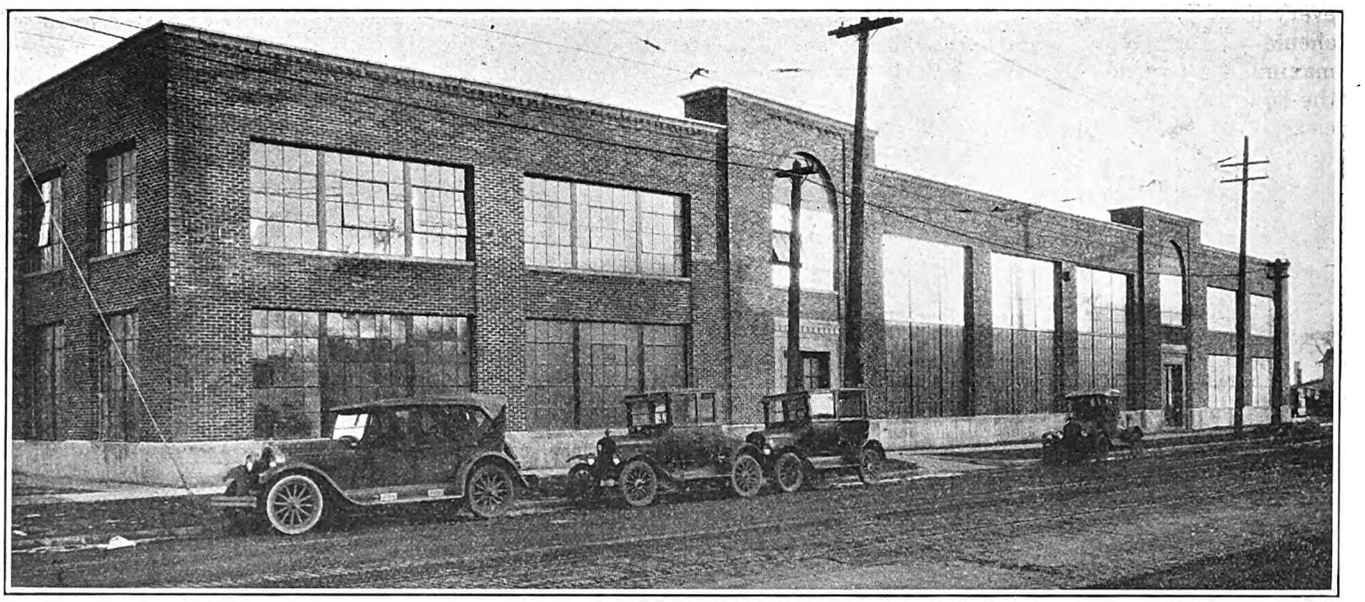


Combination Shop and Carhouse of the Aurora, Elgin & Fox River Electric Company Has a Steel Skeleton on Concrete Foundations with Brick Walls and a Wood Plank Roof

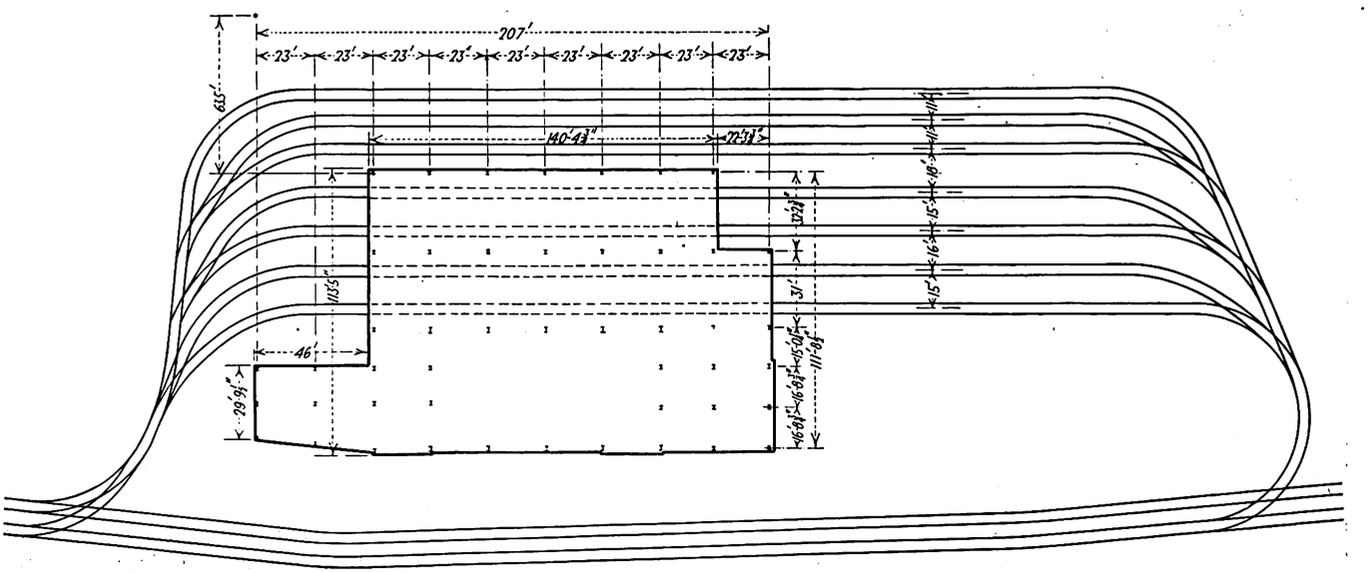
New Shops Built for Fox River Line

Roomy and Well-Lighted Structure at Aurora Is Used for All Major Repairs, Overhauling and Car Painting Work of This Railway—Machine Tools Are Provided with Individual Drive

By Bruce Vernon
Division of Construction & Engineering, Stone & Webster, Inc.

CONSTRUCTION of a new bridge across the Fox River at Aurora, Ill., and a consequent change of 5 ft. in street grade recently necessitated the abandonment of the old carhouse and shops of the Aurora, Elgin & Fox River Electric Company. A new shop and carhouse was designed and constructed during 1925 by the division of construction and engineering, Stone & Webster, Inc. While the old structure was on the east bank, the site selected for the new building was on the west bank of the Fox River at River and First Streets, about ¾ mile south of the old carhouse. This change in location has resulted in giving the railway much improved facilities.

The main building is 113 ft. wide by 209 ft. long, with a two-story section at the north end 35 ft. wide by 46 ft. long which is used for trainmen's quarters. Provision has been made for the extension of the building east and south. The building is constructed with a



Track Layout and Building Arrangement of New Combination Repair Shop and Carhouse at Aurora

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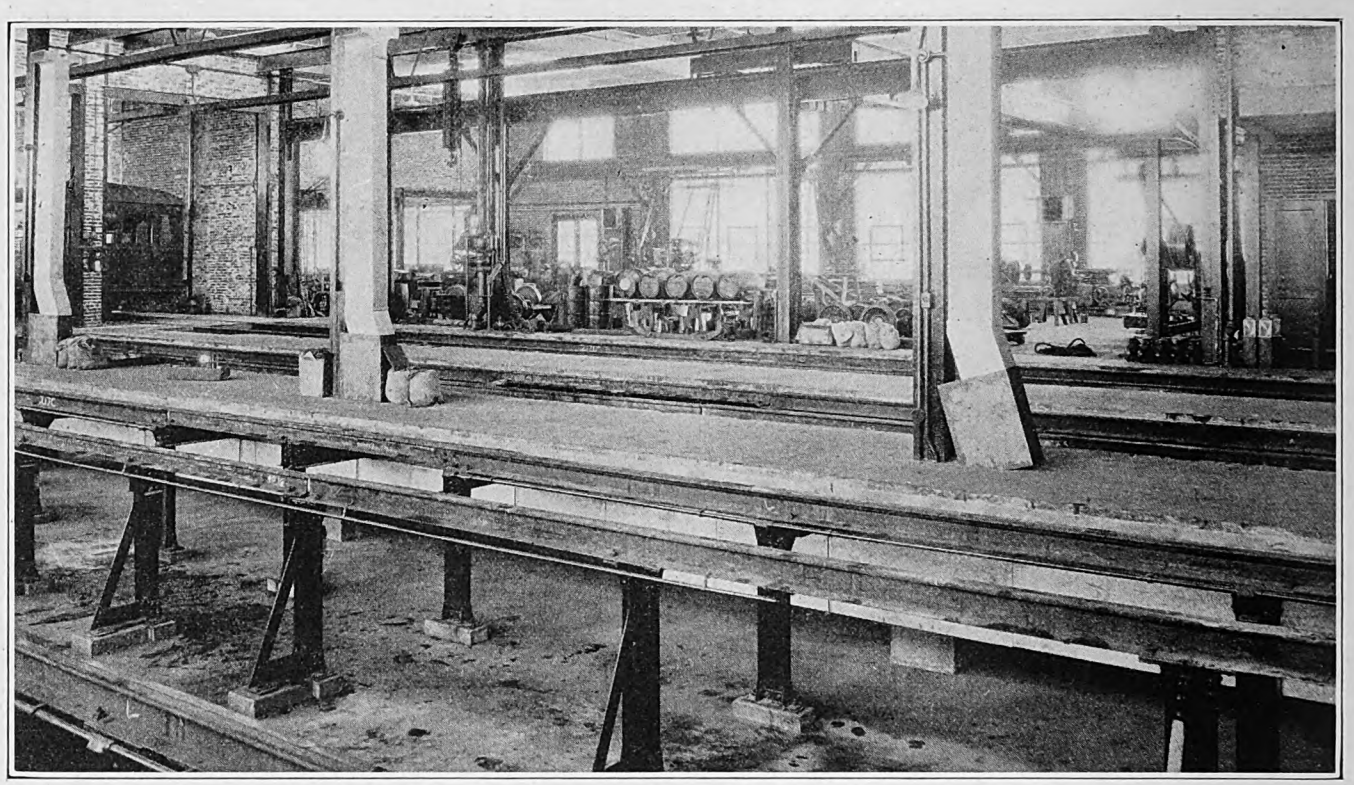

Flooring Has Been Omitted Between the Tracks in the Inspection Shed to Give an Unobstructed View of the Trucks and Underbodies

Materials Are Handled in the Machine Shop by a 5-Ton Electric Crane Operated from the Floor

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steel frame, concrete foundations, brick walls and a wood plank roof. Floors are of concrete, except in the machine shop and carpenter shop, where wood block has been used. Flooring was omitted between the tracks in the inspection shed to allow for unobstructed view of the trucks and underbodies of the cars.

Large track doors at the north and south ends of the building are of wood, 13 ft. wide by 16 ft. high, and of the jack-knife type. Rolling steel doors are provided between the paint shop and the machine shop. Ample light is admitted through large windows with rolled steel frames on the east and west sides of the building, three sawtooth monitors in the center portion of the building and skylights over the machine shop and armature repair room.

Shops and carhouse are heated with four indirect unit heaters and the trainmen's quarters and armature repair shop by direct radiation. In addition to the floor unit heaters, a warm air heating system was installed in the pits to dry the underside of the cars during the winter season. The unit heating system has been in operation during cold weather and has proved very satisfactory. Steam for heating is supplied from a power plant near the carhouse.

The master mechanic's office is located on a mezzanine floor in the north end of the machine shop, where he has an unobstructed view of the shop and inspection shed.

The building is equipped with roof sprinklers throughout. Fire hydrants are located in the outside car storage yard. Separate toilets and locker rooms are provided for trainmen and shopmen. The locker rooms are equipped with showers. An open floor drainage system was installed, draining into sumps and covered with grating to allow for cleaning. A spray car washing system is provided for washing cars.

The main storeroom of the railway company is located across River Street from the carhouse and the shop storeroom is used for auxiliary stores.

On the west side along River Street are located the machine, blacksmith, welding and carpenter shops, with a mezzanine floor at the south end of the building for repairing of armatures and controllers. The two tracks adjacent to the machine shop are used for body and truck repairs. South of the machine shop is located the paint shop. The railway operates motor buses, which will also be painted in that shop. The two east tracks are for car inspection and washing.

Modern Equipment Provided for Machine Shop

Machine shop equipment consists of a 200-ton wheel press, a 36-in. engine lathe, a 20-in. lathe, shaper, radial drill, 24-in. drill, hacksaw, emery grinder, forge and air compressor. Provision has been made for the future installation of a wheel lathe in the machine shop near the wheel press. In the carpenter shop a rip saw and combination wood-working tool are installed. The armature shop equipment consists of a 22-in. lathe and a banding machine. Some of the equipment was removed from the old carhouse and additional equipment was purchased. Wherever possible, all tools were provided with individual drive.

Materials are handled in the machine shop by a 5-ton electric floor operated traveling crane. Air monorail hoists were provided over the tracks used for body and truck repairs for raising car bodies from the trucks. Armature and wheel changes are handled by an air pit jack mounted on flat wheels, by which they are moved to the south end of the pit, where a jib crane is used to raise them to the machine shop floor. This jib crane was also designed to swing a complete car truck from the car tracks to the wheel storage tracks. For raising armatures and controllers to the mezzanine floor an electric hoist was provided.

The carhouse was designed with track connections from River Street to each end of the carhouse. Approximately 90 cars are operated from the carhouse. The repair shop is used for all major repairs, overhauling and painting of cars from both Aurora and Elgin. Storage tracks on the east and south sides of the building are used for open storage, and for a property of the size of the Aurora, Elgin & Fox River Electric Company the open storage for cars is thought to be quite satisfactory.

Pittsburgh Railways the Big Brother of Invention

IF NECESSITY is the mother of invention, then suggestion might well be called the brother of invention. The Pittsburgh Railways is acting like a big brother to its fraternity of employees, in that it is rewarding them for bringing in suggestions. These ideas have not only proved valuable as savers of time and money, but the freedom of thought allowed has been a stimulus leading in many cases to invention of devices.

Ideas are forwarded to a department of the Philadelphia Company, of which the Pittsburgh Railways is a subsidiary, known as the suggestion department. This body encourages the making of suggestions by employees on any subject. There is a committee that reviews all suggestions after submission to department heads. It decides whether or not the suggestions should be adopted, and sets the value on the suggestion, cash prizes being granted in amounts anywhere from $5 to $75.

The way the plan works out in practice is well illustrated by the following incident, which is typical of what can be accomplished. On Jan. 21 a letter was received by the suggestion department from one of the shop men, signed "A Dynamic J.," a fictitious name, of course. But the real name was not lost sight of, nor was the idea, because a few weeks later a reply was sent, inclosing a voucher for $50.

These letters will tell the story:

Date, 1-21-26.

WILLIAM A. COYLE,
Chairman Committee on Suggestions.
DEAR SIR:

The car-wheel boring machines at Homewood Shops (P. R. Co.) have individual motor and gear drive with ordinary control equipment. When the operator wishes to shut down the machine, in order to change the tool setting, gage, the bore, or remove the work, he must wait until the table on which the wheel rests stops rotating. At present the wheel will rotate about nine revolutions after the power has been shut off. This rotation is slow and cannot be stopped by ordinary manual means, due to the great weight of the rotating table and revolving armature. Much time is lost by the operator and machine in waiting for the table to stop. This loss is considerable on account of the frequent stops which are necessary.

I would suggest that a dynamic brake be applied to the machine, to overcome this fault. This device is simple and functions in stopping the machine. It will stop the rotation of the table in less than a quarter of a revolution after throwing the switch. This is accomplished by the *dynamic braking* of the motor. The total cost of this device is estimated at less than $5 each.

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In addition to saving considerable time, it has the advantage of being a safety device. Should the operator's clothes become entangled in the revolving table, the machine can be stopped before serious injury results.

This can be applied to any motor-driven machine.

Fictitious Name, A DYNAMIC J.

March 17, 1926.

INSTALLATION OF DYNAMIC BRAKE ON CAR WHEEL BORING MACHINES AT HOMEWOOD SHOP

DEAR MR. LUDWIG:

Thank you very kindly for your letter offering suggestion relative to the above subject.

The committee referred your idea to Mr. T. Fitzgerald, vice-president of the Pittsburgh Railways Company, who informs us that your idea will be adopted. It will save time and also prevent accidents.

It is a pleasure to inform you that the committee, at its last meeting, decided to give you an award of $50, voucher for which is attached.

May we have other of your ideas?

Sincerely yours,

Chairman.

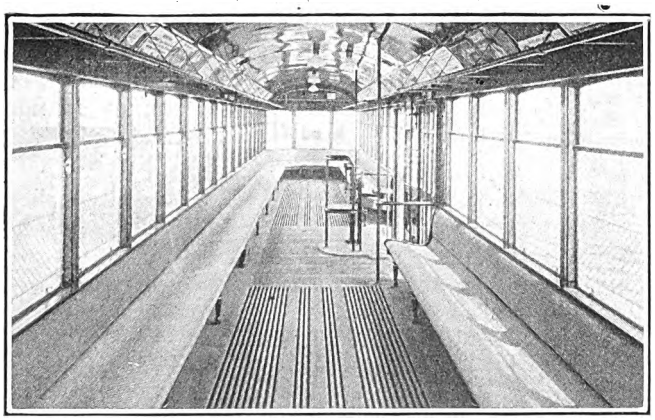
MR. ALBERT J. LUDWIG,
Homewood Shop.

Copy to Personnel Department.

Leather Upholstered Seats in Regular Cars Prove Popular in Cleveland

MUCH talk about the desirability of comfortable seats caused a recent experiment on the part of the Cleveland Railway. Its standard two-car trains have a combination of cross and longitudinal seats in the motor car and all longitudinal seats in the trailer. One of these trains was stripped of all seats. After refinishing the interior, comfortable leather-upholstered, bucket type seats were installed, as shown in the views. The seats have full spring construction covered with loose padded leather seat cushions. The backs are shaped to give the sense of an individual seat.

The interest shown by the public was a source of astonishment to the management. People inquire daily

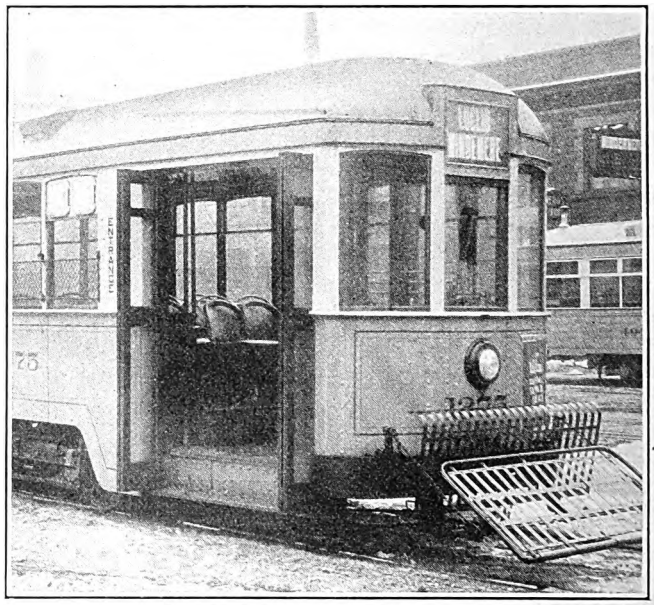


Looking Forward in a Standard Trailer Used in Cleveland, Showing Seating Arrangement

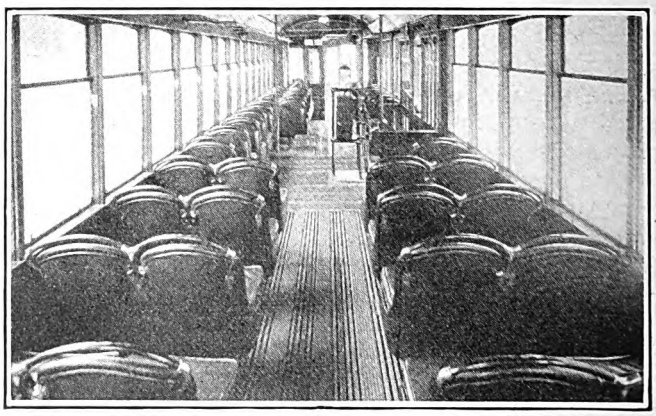
of inspectors and trainmen when the car with the comfortable seats is due to pass their corner and the telephone operators at the company's switchboard frequently have calls of a similar nature.

All of the new seats face forward. In the rear of the motor car the seats are placed two and two across the car. Where more space is desirable the aisle is made wider by using only single seats on one side.

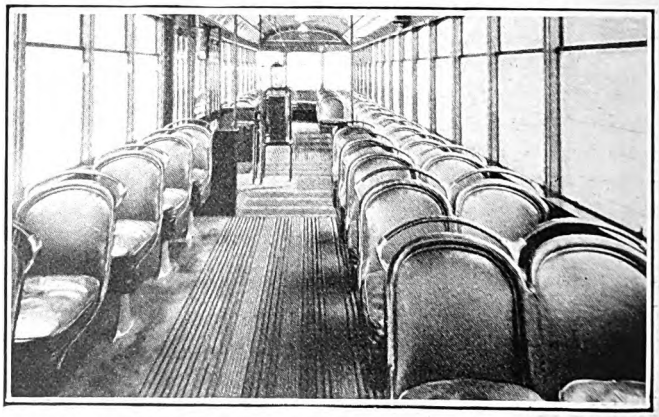
Seating capacity is not materially changed by this new plan, largely because the old trailer seating was not so very economical. In the new arrangement 48 seats replace 56 of the old type, while in the trailers 60 of the bucket type seats are used instead of 57 or 58 of the old type (depending upon the use of a stove or electric heat in winter). For the whole train only five less seats of the new type are provided, but the comfort and desirability of the seats from the ride-selling standpoint are many times as great.



The New Seats in Cleveland Experimental Train Are an Invitation to Come in and Ride



In the Cleveland Experiment with Comfortable Seats of the Luxurious Bus Type All Passengers Face the Front



Bucket Type Leather-Upholstered Seats Being Tried on One Two-Car Train of the Cleveland Railway Have Proved Very Popular

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Improved Instrument for Car Operation Tests

By A. W. Swan, B.A.Sc.
Evershed & Vignoles, Ltd., London, England

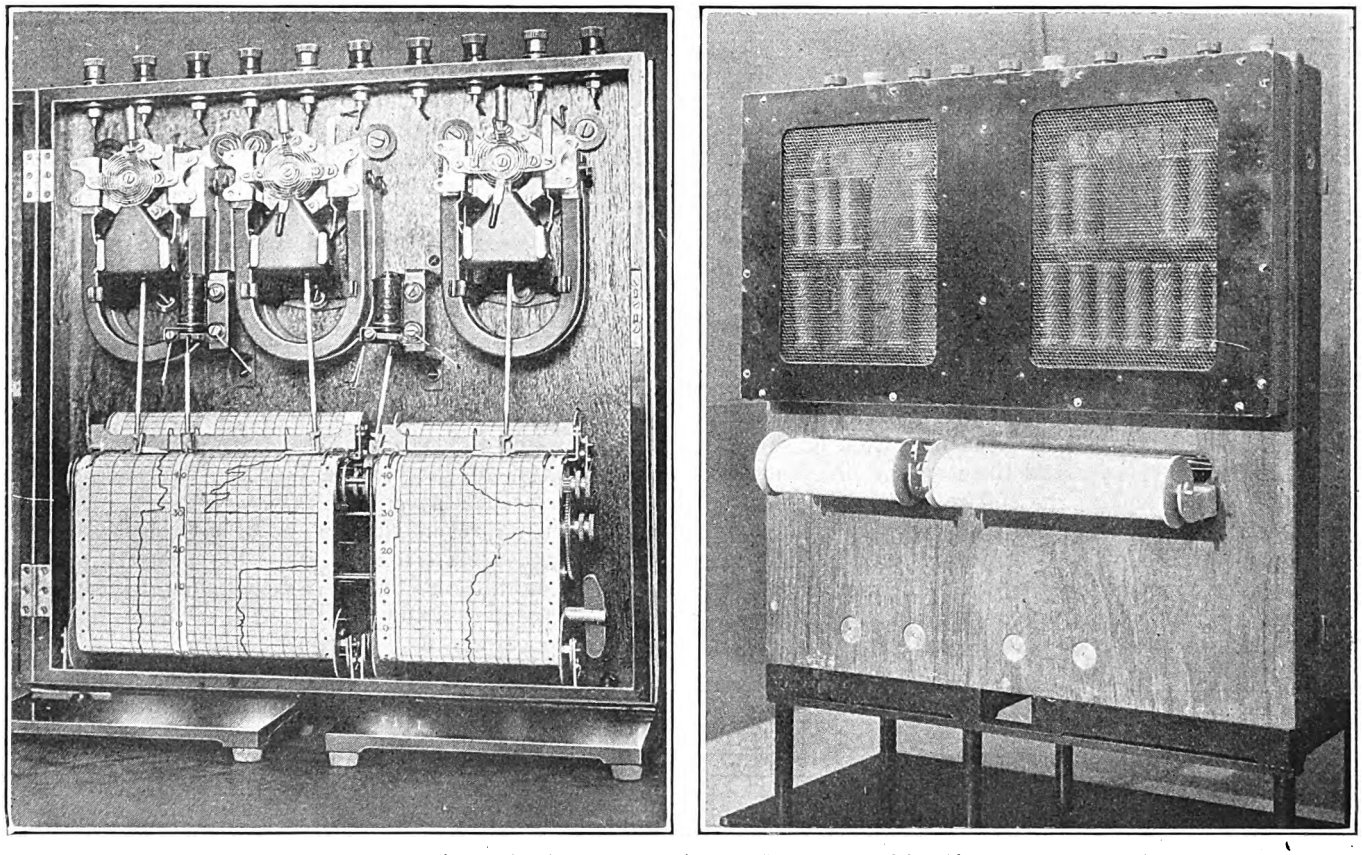
INTERRELATED records arranged side by side to show speed, current, volts, stopping time, and brake applications are particularly desirable to electric railway test engineers. To supply this need a comprehensive instrument, called the traction recorder, has been placed on the market by Evershed & Vignoles, Ltd., London, England. A short description of this instrument was published in ELECTRIC RAILWAY JOURNAL for March 7, 1925. Since that time, however, a number of improvements have been made as the result of the practical use of this instrument, particularly in tests made by the Metropolitan Railway, London.

The recorder shown herewith was designed specifically for use on electric railways which employ direct current. The design, however, can be readily modified for use on either single-phase or three-phase systems. For electric railways using alternating current, records would be shown for current, voltage, and power relating to true kilowatts, wattless component, power factor, etc. The instrument is portable and can be transferred readily from one location to another. However, to insure steady recording when a car or train is traveling at high speed it is necessary to have the instrument fixed in some semi-permanent position.

The traction recorder, as improved, charts five individual records. These are: (1) Line voltage; (2) station stops; (3) total current; (4) brake applications; (5) speed in miles per hour. All records are in perfect synchronism, so that the charts are readily comparable. The time lines are straight, so that the values of current, voltage and speed at any particular instant can be compared readily. Particular attention has been given to produce an instrument which is not affected by train vibration or by external electrical and magnetic forces. Accuracy of the records produced has been considered as of greatest importance.

The recorder as arranged for direct-current railways is 20 in. x 20 in. x 8 in. in size and can be mounted in any convenient location in an electric car or locomotive. An accompanying illustration shows the instrument. It will be seen that the five records are produced on two rolls of cross-section paper. These are driven in synchronism and the perforations along the edge are arranged so that the records readily can be lined up for comparison. The individual records are produced by five pens which hang vertically from their supporting mechanism.

The records shown in the illustration, reading from left to right, are: Voltage, brake applications, current, station stops, and speed. The pens recording brake applications and station stops are operated by small electro-magnetic movements, while the three pens recording speed, current and voltage are controlled by instrument movements of the Evershed moving coil, moving iron, dynamometer, or ratiometer type, suitably shielded from external magnetic fields.



Front and Rear Views of Traction Recorder, as Arranged to Provide Five Simultaneous Records

The pens are designed to trace their records on a horizontal surface, and they are therefore always in contact with the chart paper even when the train is passing over switches or around curves. In order to minimize the effect of train vibration, the movements are balanced and heavily damped. Special non-spilling dashpots are also provided.

The success in neutralizing the effect of train vibration may be seen from a study of the chart reproduced herewith, which is a small section of a record taken by

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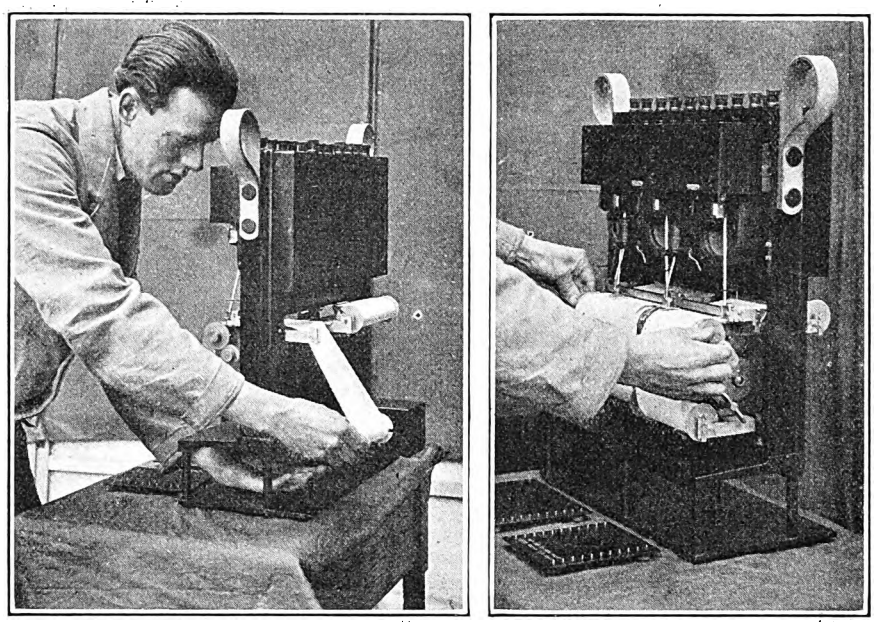

Attaching the End of a Used Chart to a New Roll for Continuing the Record

engineers of the Metropolitan Railway, London. Recording on a chart 3½ in. wide, the maximum error due to train vibration was less than 1/64 in. when the train was traveling at 73 m.p.h. through a junction and over crossovers.

The chart speed can be varied from 1 in. to 12 in. per minute by changing the driving gears. The chart reproduced was made at a chart speed of 3 in. per minute, and the section reproduced is for a run between Neasden and Kilburn. This particular section was selected in order to show several short runs and not to illustrate characteristics of train operation or schedule requirements. The vertical lines on the original chart are 1 in. apart, and as the roll for this particular test was moving 3 in. per minute, the vertical lines represent time intervals of twenty seconds. These have been reduced in the illustration. The train on which this record was taken was a local, made up of two motor coaches and five trailers.

In the test referred to, one-half of the passenger space inside a motor car was fitted out as a testing compartment, a temporary wooden partition being placed across the car. The recorder was attached to the partition, and also rested on a table which was used for convenience of the operating staff. In addition to the recorder, a portable ammeter and voltmeter were used to take readings from time to time as a check on the figures of the recorder. An air gage and mechanism for controlling the brake record also were provided. Spare parts and other testing accessories, such as stop watches, log books, etc., were carried in two drawers fitted to the table. The speed record was obtained electrically from a small generator driven by one of the car axles. In order to compensate for different wheel diameters, as might be caused by wear, a wheel diameter compensator was used.

Provision is made so that a chart can be renewed without stopping the instrument. A spool of unused charts is carried on brackets mounted outside the back of the instrument. This can be fed through a slot. When it is seen that the used chart is nearing its end, it is unrolled and passed under the instrument, where it is pasted to the new roll. The new roll is then passed back under the instrument and put into the regular bracket. In order to insure that the registration of the double-peg drive is continuous, the joining of the two rolls is made on a special board with pegs on both sides corresponding to the actual drive. With such a board, the operation of pasting together the two ends can be done very accurately and quickly.

Another improvement consists of a prolonged metal surface underneath the chart. This permits making pencil notes on the records as the instrument is running. Loose flanges are also provided on the bottom spool, so that the paper can be slipped off quickly.

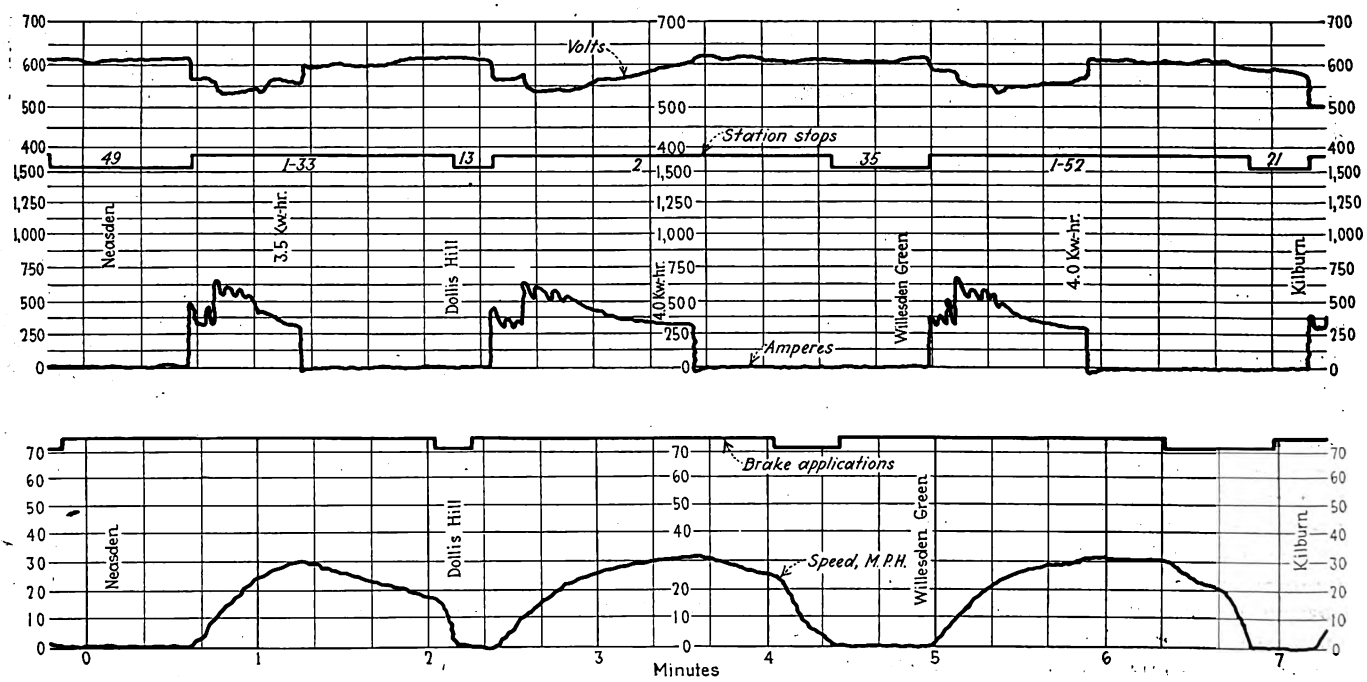

Chart Record of a Small Section of a Run Made on the Lines of the Metropolitan Railway, London

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Dick Prescott Sees the Boss

and Makes a Recommendation

DICK PRESCOTT, engineer of equipment of the Consolidated Railway & Light Company, and his friend Steve White, the carpenter shop foreman, spent several busy evenings discussing the maintenance of old cars and preparing estimates on the costs for the various types of cars in service on the property. They were seriously handicapped by the lack of operating and maintenance cost records for different groups of cars. They did manage, however, to make up estimates for the older groups in comparison with cars bought in recent years. Their primary purpose was to find whether the expensive reconstruction work that was being carried out in the shop on the old equipment was justified.

When they had put their figures together Steve and Dick decided to lay them before Thomas Mullaney, general foreman.

Under the changed conditions in the Consolidated organization they felt sure the boss would welcome their suggestions and would give them a hearing. This was indeed a new order of things in the shop. A year before no one would have dared make such a report to Mullaney. But the word had gone down the line that the property was being operated to make money and not to save it. Along with this had gone the idea that the only way to make money was to make the company's service worth money—enough money to show a profit at the end of the year. Department heads who had formerly been under constant pressure to hold down their expenses were now being pushed for new suggestions on how to improve the company's service with a view toward building riding on its cars and making its patrons into friends and boosters.

Mullaney was an entirely changed man under the new conditions. The old defensive hard shell with which he had formerly protected the precedents of past years was almost entirely gone as the result of the need for stimulating interest and constructive thinking among the members of the shop staff.

When Dick and Steve entered his office, Mullaney looked up with a twinkle of interest in his eyes as he inquired the purpose of their visit in his usual gruff manner.

"Well, what have you fellows got on your mind now?" he asked.

"Steve and I have been doing some figuring during the past week or so," replied Dick, "and we've got some information put together here that we think you will want to have."

"Figuring about what?" queried Mullaney.

"Car maintenance costs," replied Dick.

"What do you fellows need to be figuring on that for? I've got all the records right here from the auditor."

"We realize that, Mr. Mullaney. We haven't been fooling with maintenance costs per car mile for the department. That's a matter of checking total expenditures and determining the total amounts spent for labor, material and other principal items. We've been trying to get at a comparison between the different types of equipment."

"Well, I don't even see what you've got to do there. I've got mileage records on armature rewinds, pull-ins, bearings, gears, wheels and other items. We keep figures on oil consumption, glass, trolley wheels and lots of other things. We know more about those items right here in the office than you men could ever dig out in a year."

"That's true, Mr. Mullaney, but what we were after was the comparison of different types of equipment."

"All right, we've got that too. We've made tests right along to check up on how each manufacturer's stuff stands up, particularly when we get anything new to try out."

"Yes, I'm following all those records in the engineering department, Mr. Mullaney, and I am also carrying some of those tests further. But Steve and I have been going after another and a very important side of this story. We're trying to get a comparison between the total operating and maintenance costs on some of the older equipment, like the group of 200 class cars for example, and on the newer light-weight cars that we put in service several years ago. We've tried to find out whether or not it would be better to scrap the old 200s and buy new cars with modern improvements than to spend $2,200 apiece on them for rebuilding, as we're doing right now."

"Oh, that's what you fellows are driving at, eh? Well, what have you got?"

"We've got some estimates that look very interesting," said Dick, as he handed Mullaney a copy of the report that he and Steve had prepared.

Mullaney glanced through the report, while Dick and Steve sat by in silence.

"Huh!" he finally exclaimed. "You think we ought to get rid of the 200s instead of rebuilding them, and buy some new cars in place of them?"

"It looks very much that way," answered Dick.

"That sounds all right, but where do you think we're goin' to get the money?"

Dick was ready for the question. "The amount we're spending on the 200s right now is more than half the first payment cost on the same number of new cars," he responded. "We figured that it would only be necessary to raise as much more as we're now spending, and that the saving in operating and maintenance alone would more than pay off the entire cost of the cars."

"If that's so," replied Mullaney, "it looks to me as though you fellows had something here that we ought to be thinking about. How did you get at your figures?"

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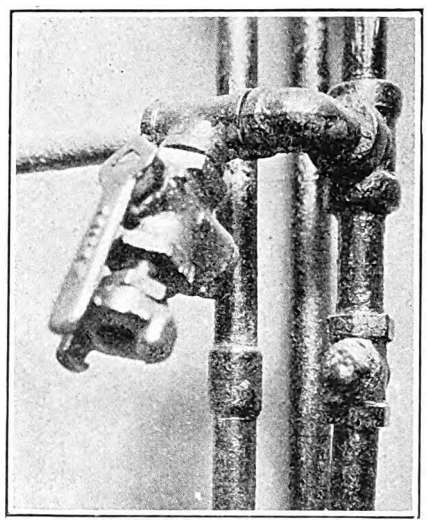
Maintenance Notes

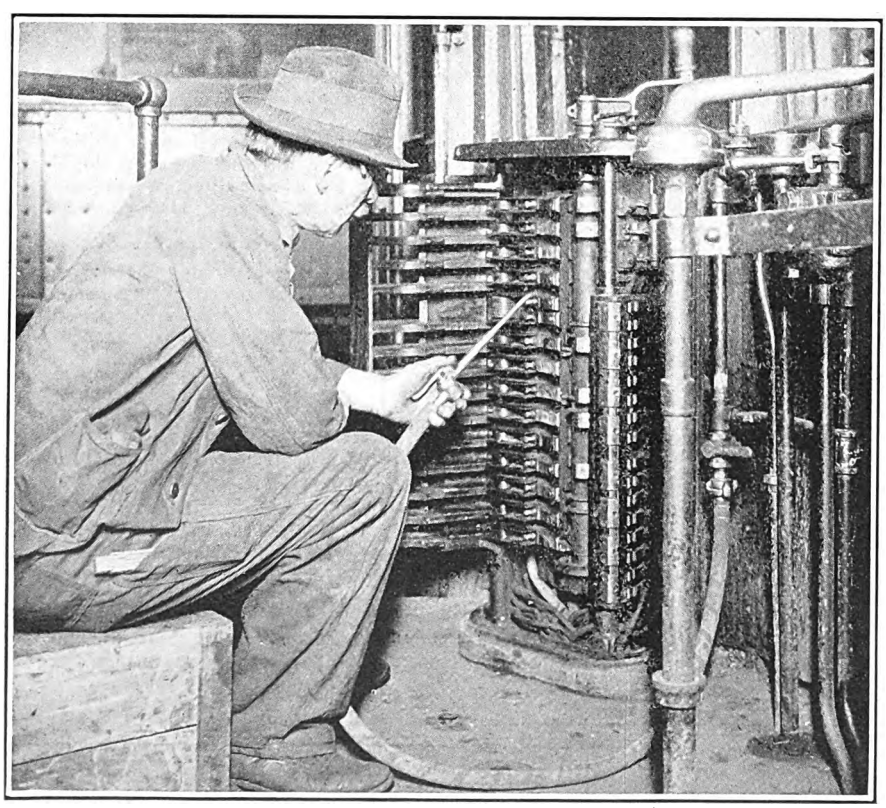
Convenient Attachment for Blowing Out Controllers

CLEANING and blowing out controllers is considered a most essential part of the inspection of car equipment in the shops of the Department of Street Railways, Detroit, Mich. To provide a convenient method for attaching the air hose and also to eliminate the necessity of having the workman handle a long line of hose for this work, each car has been equipped with a shut-off valve in the main reservoir line alongside each controller. These valves and the end of the hose are provided with Universal air hose couplings, so that the hose can be attached very quickly.

To blow out a controller, the workman attaches a length of approximately 5 ft. of hose to the coupling alongside the controller. This hose has a special fitting at the end, with a long tapering nozzle, so that the air can be directed in an effective manner. The nozzle is also provided with a valve so that the air supply can be regulated as it is used. The accompanying illustrations show the hose attached and nozzle for blowing out a controller, and also a close-up view of the Universal fitting for attaching the hose.



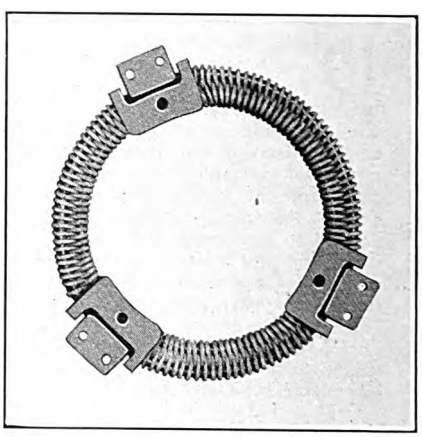
Close-Up View of the Air Valve and Universal Fitting for Attaching Hose to Blow Out Controllers



Removing Carbonization and Dust from a Controller by Air Blast on One of the Cars of the Department of Street Railways, Detroit, Mich.

Rope-Laced Compressor Suspension Used

NOISE of air compressors has been reduced by a special suspension in a trial made by the Buffalo & Erie Railway, Fredonia, N. Y. This suspension, which consists of two circular rods laced together with specially treated trolley rope, has reduced the noise of compressors transmitted to the car body about 80 per cent. The type of compressor suspension illustrated is for the General Electric Company's type CP 27-S compressor. The suspension consists of two circular 1-in. rods with supporting lugs welded



A Noiseproof Compressor Suspension Is Obtained by Lacing Two Rings Together with Trolley Rope, the Inner One Serving as a Support for the Compressor, While the Outer Ring Is Fastened to the Car

onto them. The outer ring has three lugs which bolt to the car body. The inner ring has three lugs which bolt to the compressor housing. Safety lugs are also provided on the center ring at each point of support which extend out over the outside ring with sufficient space between them and the ring to allow for the rope lacing.

The two rings are laced together tightly with ordinary trolley rope which is treated with linseed oil and paraffin, so that it will not deteriorate from exposure to the weather. Before the rope is attached, the rods are taped so as to do away with any tendency to cut the rope from contact with the rod. With this type of suspension, the air connections to

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the compressor are made through rubber hose.

The management of the road states that the flexible compressor suspension eliminates almost entirely the more pronounced and objectionable noises created by the running of the compressor. These were most objectionable when the car was running at low speed or standing still. The effect of the improvement has a decided bearing on passengers and their general comfort, aside from the elimination of noise in the moving equipment on the highway.

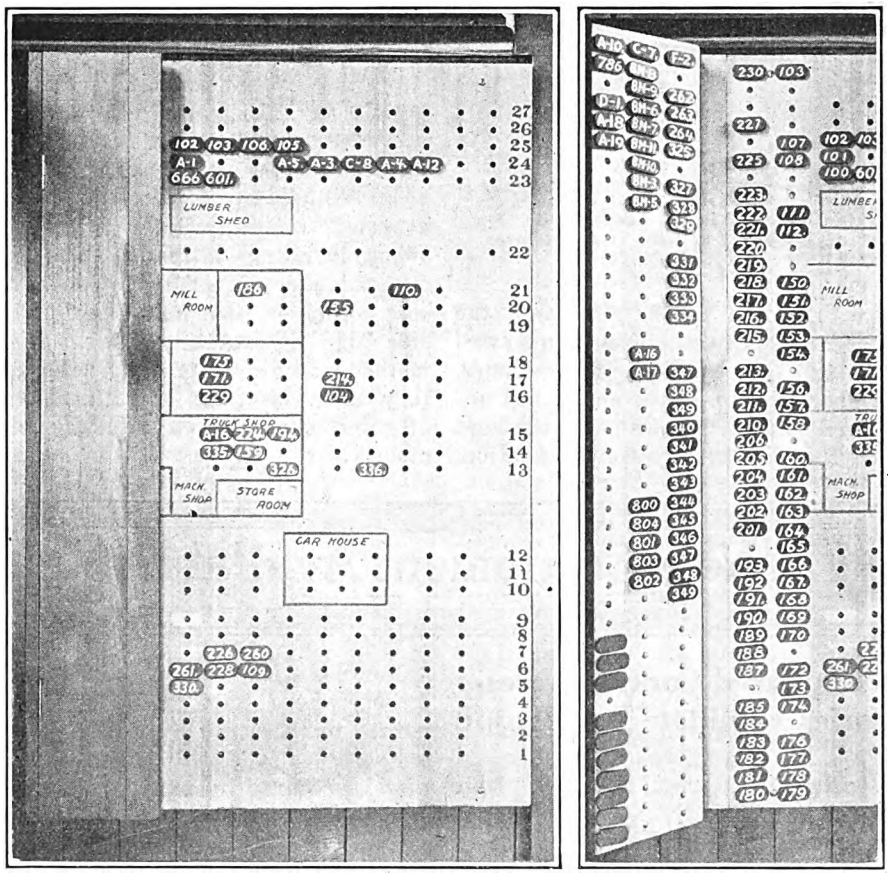
Dust Washed from Air After Cleaning Armatures

MANY electric railway shops are provided with special facilities for blowing the dust from armatures and other electrical equipment preparatory to rewinding or repairing. The Los Angeles Railway, Los Angeles, Cal., however, has added another improvement in that the air as it is drawn out from the cleaning compartment passes through a tank containing an arrangement of pipes for spraying water. This washes the air clean before it is once more returned to the outdoors.

The equipment provided in the Los Angeles shop consists of a special compartment in which armatures, motors and like equipment are cleaned. The electric parts are suspended from an iron rod and the compartment is completely closed except for a small aperture through which the cleaning nozzle is inserted. Air and dust after removal from the equipment are drawn out by an exhaust fan.

Board Shows Location of Cars

DIRECTLY in front of the desk of the superintendent of equipment of the Erie Railways, Erie, Pa., is a large board arranged to show the location of all cars which are in the shops or adjacent storage yards. This board is made up twice a day, so as to make certain that it represents conditions as they change. It consists essentially of a layout of the shop and tracks, with holes arranged at the correct intervals along the center lines of the tracks so that small wooden blocks can be inserted to represent the cars. These blocks have car numbers painted on them, so that when the board is made up it shows the location and number of each car. The tracks are numbered from 1 to 27, beginning at the bottom of the board. The first nine tracks are in the storage yards. Tracks 10, 11 and 12 go through the carhouse, tracks 13, 14 and 15 into the truck shop, 16, 17 and 18 into the carpenter shop, 19, 20 and 21 into the paint shop; track 22 is between the paint shop and lumber shed, and tracks 23, 24, 25, 26 and 27 in the yard adjacent to the lumber shed. The left-hand edge of the board has a hinged cover with space for keeping the blocks representing cars which are in service or at other points of the system. The board is 44 in. high and 30 in. wide. The left-hand side door is 7 in. wide.



This Board Has Been Found Particularly Convenient for Keeping the Master Mechanic Informed as to the Location of Cars in the Shop
At left, board as it appears normally. At right, with hinged cover open.

Painting Destination Signs with Roller and Mask

NOT long ago an acknowledged expert in the painting of destination signs by the spray process challenged one of the International Railway (Buffalo, N. Y.) sign painters, who favored the roller and mask method, to a race. The latter won a decisive victory, as he was able to turn out the curtains at a normal rate of one every five minutes and, furthermore, the finished product was a thing of neatness and beauty, which could not be said for the product of the challenger.

The I. R. C. method is to place a mask on the linen curtain, which is Sun-Fast Holland heavy linen, then after tacking the curtain and mask firmly in position, the inked roller is passed back and forth across the whole until the entire curtain is completed. Roller signs of indefinite length may be made in this fashion, as the completed portions are simply moved on out of the way and further sections inked.

Impregnated Motor Cleats Prevent Short Circuits

CLEATS for holding motor leads are commonly made of hard wood. When these become water soaked the insulation resistance between leads is decreased considerably and sometimes short circuits result. The wood also rots quickly.

To keep water out of such cleats the Department of Street Railways, Detroit, drys out the new cleats in a baking oven and, while still hot, soaks them in linseed oil. Increased life and decreased trouble have resulted. In making the cleats, holes

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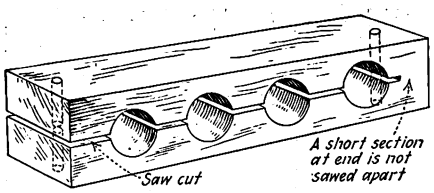


Hard Wood Motor Lead Cleats Are Impregnated to Keep Out Moisture in Detroit

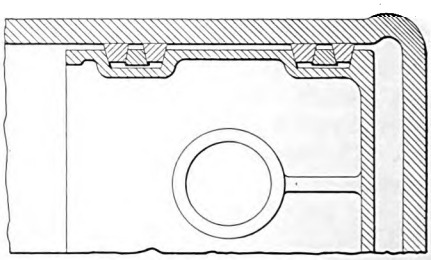
are drilled of proper size to fit the leads. The blocks are then sawed through the center line of the holes. A short section at the end is left unsawed so that the two parts are kept together until ready for installation.

Disk Grinding of Motorman's Valves Saves Time

FOR grinding in motorman's valves, the Erie Railways, Erie, Pa., makes use of a cast iron disk ¾ in. thick by 12 in. diameter, attached to a compressor motor. When grinding valves a carborundum paste is spread over the valve seat, which is then held against the side of the rotating disk. This method has proved entirely satisfactory and the time and the labor of grinding have been reduced enormously.

Bus Engine Piston with New Type Rings

PISTON rings of the conventional type used with automotive equipment are of one piece, step-cut, and are placed in a straight groove. With the ordinary type of piston, the cylinder walls, after long usage, become worn out of round, because the pressure of the connecting rods caused by the rapid revolving of the crankshaft forces the pistons against the cylinder walls. The piston rings, too, wear thinner, and as they do they become weaker, losing their pressure against the cylinder wall. In addition, the grooves wear also, so that sooner or later the motor develops what is known as "piston slap" and becomes noisy. Because of the loose-fitting rings, power is diminished and gas and oil consumption increase rapidly. Heretofore the only effective remedy for such trouble has been to take the motor down and send the block to a regrinding shop, where the cylinders are rebored and fitted with oversize pistons and rings. This method is expensive



A Three-Piece Ring Guides the Piston and Eliminates Slap

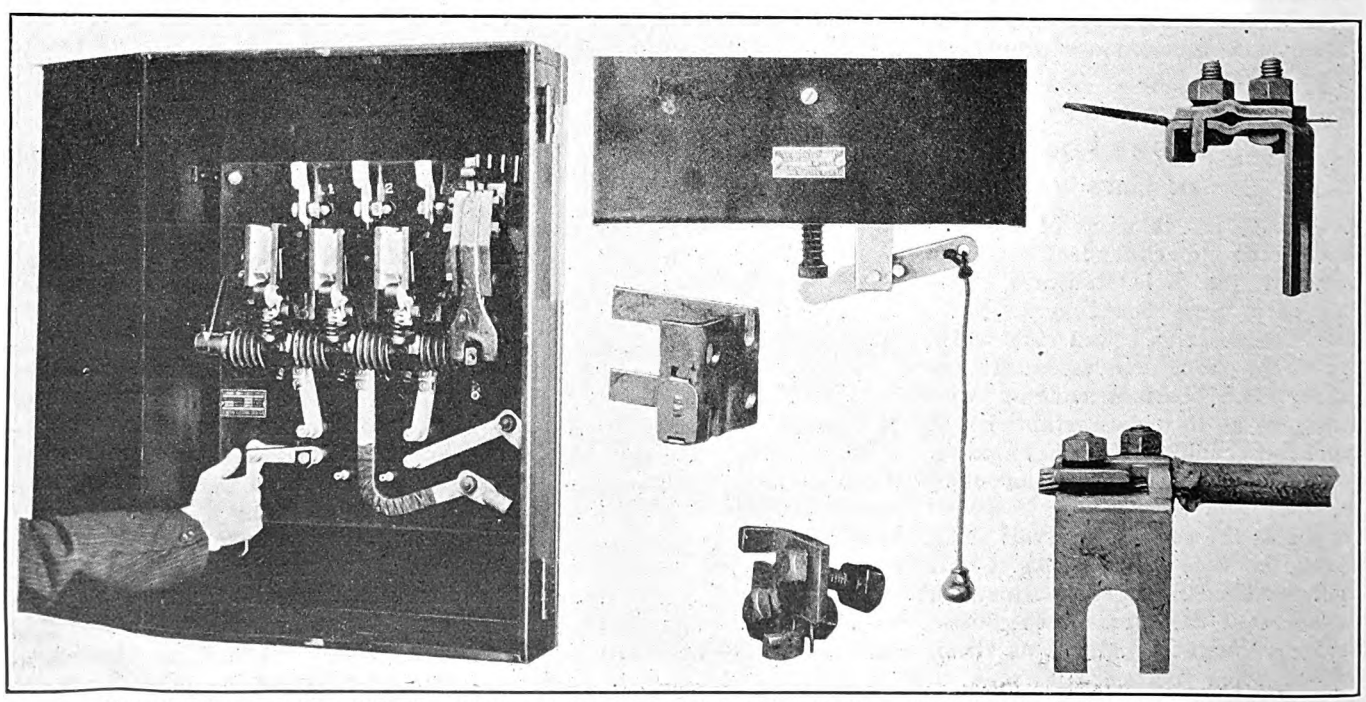
New Equipment Available

Improved Control Accessories Facilitate Installation

RECENT control devices marketed by the General Electric Company, Schenectady, N. Y., include a resistor terminal, an external relay reset, a relay installing wrench and a relay mounting panel. With the exception of the resistor terminal, the new equipment is designed to facilitate the use of temperature overload relays. The improved terminal simplifies installation of resistors. Only one size is needed for all currents up to 225 amp. Soldering is unnecessary to secure stranded cable and the mechanical construction is improved so that changing taps is simplified.

For use with those control installations where starters do not incorporate temperature overload relays, temperature overload protection may now be secured by using a new design of auxiliary panel on which a temperature overload relay may be mounted. It is equipped with a novel resetting feature, which allows external resetting by means of a cord.

A special installing wrench for mounting relays in those panels and switches which do not contain them has been designed and is delivered as part of the control equipment with which they are needed. With this wrench the danger of damage to the thermostatic strips while installing is minimized.



At Left, Relay Installing Wrench. At Top, Center, External Resetting Device. At Right, New Terminal for Resistors

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and at best is only temporary, for in the majority of cases there is a recurrence of the old troubles.

To provide a remedy for such conditions experiments have been conducted and the "Anti-Slap" piston with specially designed rings has been developed by the Anti-Slap Piston Company, Rahway, N. J. This piston has two beveled-edge grooves, one near the top and one in the skirt. Each groove is fitted with a three-piece ring, two pieces of which bear against the cylinder wall. The outer rings are beveled on both sides, to fit against the beveled groove in the piston and the bevel of the center ring. The wall pressure of the outside rings is small, but the outward pressure in the center ring forces them against the beveled edges of the groove in the piston and against the cylinder wall.

The center ring does not come in contact with the cylinder wall, does

Piston with Specially Designed Rings

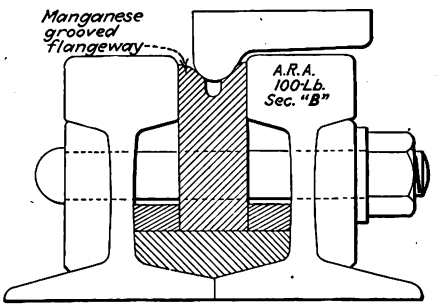
not wear away and constantly retains its pressure. The break in the center ring is at right angles to those of the outer rings. This causes the inner ring to exert its greatest pressure against the outer rings at their joints, forcing the outside rings to conform to the cylinder bore and have a tight bearing against the beveled edges of the piston grooves. This action of the rings guides the piston and eliminates piston slap.

With the use of "Anti-Slap" pistons it is claimed motors will run more quietly and smoothly; oil cannot work past the rings to foul the spark plugs, thus reducing oil consumption; gasoline consumption is reduced because of the more tightly fitting rings and more power is obtained, making the engine more efficient in its operation.

Track Crossing Has Manganese Filler

SPECIALLY designed for surface street car lines, the Wiswell improved crossing embodies an ordinary built-up rail crossing to which certain patented improvements have been added. These consist of a cast manganese filler and grooved flangeway said to eliminate all jumps and pounding at intersections.

It is claimed that all wear on the extreme tip of the wheel flange is eliminated by means of the U-shaped groove which is shown in the accompanying illustration. The wheels are



Flange Bears Evenly on U-Groove

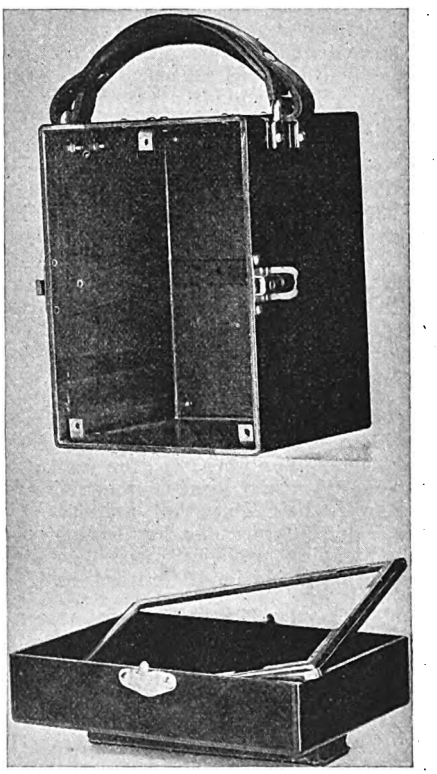
carried in the saddle of the flangeway and ample bearing is provided on both sides of the flange, allowing no weight whatever to come on the point or tip. The U-groove shown at the bottom of the flangeway protects the edge of the wheel from being chipped or broken, according to the manufacturer.

With the usual single point bearing, where the wheel bears on the extreme tip of the flange the top of the flangeway is rapidly cut down where chilled cast-iron wheels are used. Where cast-steel wheels are used the flange itself becomes flattened, and as a result the special work may become badly pounded. It is claimed for the Wiswell crossing that the absence of movable parts and the ease of replacement of the manganese flangeway reduce maintenance work to a minimum.

When the flangeway is worn down ⅛ in., it is stated that this can be raised by simply removing the bolt and placing a ⅛-in. liner between the bolster and the flangeway. This process may be repeated several times. Where surface line rails are imbedded in concrete, this replacement can be made with no disturbance to the rail proper and thus lends itself to economy of maintenance. The crossing inclines upward ¼ in. from a distance of about 2 ft. from the rail crossing proper in order to raise the wheel tread clear of the stock rail at the intersection. Over this point the flange of the wheel is carried in the saddle of the flangeway, as shown in the illustration. The manganese flangeway has been arranged to rest upon a chemically treated wood cushion attached to a steel shoe, thus giving elasticity to the crossing, a useful feature where the rails are imbedded in concrete.

One-Piece, Dustproof Meter Case

MAHOGANY-VENEER finish is used on a one-piece Micarta meter case designed by the Westinghouse Electric & Manufacturing Company for standard watt-hour meters. This case is strong, resists acids and is dustproof. A tightly fitting nickel-plated brass ring lined with felt prevents any dust from entering the box once the meter is



One-Piece Mahogany-Veneered Case for Watt-Hour Meters with Dustproof Ring and One-Piece Construction

inserted. As a protection to the meter when it is not in use, a lid of the same finish as the box itself is provided.

The handle on this portable case is made of flexible leather and is attached to nickel-plated brass lugs, so that if damaged or broken it can be replaced easily and quickly. Provision is made for plenty of room to grip the handle without cramping the hand or fingers.

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Association News & Discussions

Relieving Traffic Congestion

United States Chamber of Commerce Discusses Practical Methods to Make the Capacity of the Streets Greater and Move Traffic Faster

CONGESTION of traffic on city streets and highways was the principal topic discussed by the transportation and communication group of the United States Chamber of Commerce at Washington, D. C., on May 11. The meeting was presided over by A. L. Humphrey, president Westinghouse Air Brake Company.

Elliott H. Goodwin, resident vice-president of the Chamber of Commerce, pointed out the main results attained by the National Conference on Street and Highway Safety. Eight major subjects were considered by that body, viz.: (a) Traffic laws and regulations; (b) enforcement of laws and regulations; (c) education; (d) statistics; (e) study of causes of accidents; (f) design and maintenance of motor vehicles; (g) street and highway traffic facilities; (h) elimination and protection of grade crossings.

The National Chamber, he said, has undertaken to further particularly action as recommended by the safety conference under topics (a) and (g). It is particularly appropriate that in considering measures for dealing with the city traffic problem this body should urge the co-operation of local commercial organizations and trade associations concerned with the traffic problem to take up their share of the burden of applying, so far as practicable, in their local communities or through their lines of industry the plans and suggestions for dealing with the traffic problem as developed through the National Conference.

MR. COATES URGES CO-ORDINATION

Co-ordination of transportation facilities as an aid to the solution of the traffic problem was urged by Frank R. Coates, president American Electric Railway Association. An abstract of his paper appears elsewhere.

The rôle that the automobile industry and the automotive trade can play in connection with the traffic problem was discussed by Capt. E. V. Rickenbacker, vice-president Rickenbacker Motor Car Company, Detroit, and member of the traffic planning and safety committee of the National Automobile Chamber of Commerce. A certain proportion of highway accidents are due to operation of motor vehicles by the criminally careless, by defectives and by intoxicated persons. These cases are amenable to police discipline. A large part of the accidents, however, are due to congestion in traffic, which leads to the confusion of the driver, and to delays, which lead to subsequent unwarranted hurrying, which produces nerve strain. In this respect, the accident problem is simply a symptom of inadequate management of our traffic facilities. No one group is to blame.

Street capacity can be increased 25 per cent or more, in the opinion of the speaker, by adjusting the number of traffic lanes to the volume of traffic in either direction. For instance, in New York on Fifth Avenue, of the four lanes three are used for uptown traffic in the afternoon and the remaining one is ample for the towntown traffic at that time of day. The plan is not applicable to streets with car tracks, but can be used on through boulevards.

Parking is necessarily a local problem. The automobile trade, said Captain Rickenbacker, does not want to advocate unlimited parking. In fact, "unlimited parking" is necessarily a misnomer in crowded sections because it merely means that he who gets there first utilizes that space to the exclusion of others. Decentralization will help, as there will be less need for family motor travel downtown. When the volume of vehicles in any location becomes so extensive as to make it clear that parking is a trespass on the public convenience, in such situations it will be forbidden or limited.

If every shipper over the highways, if every merchant, if every one in the automobile business, realized the dollars and cents cost of traffic delays, we should move much more rapidly toward solution than is being done at present. Routing traffic on less frequented streets will remove an unnecessary burden on commerce and ultimately on the general consumer. Railroad freight terminals in the heart of the city, as well as loading and unloading of vehicles at the sidewalk curb, will soon disappear. Particularly will the backing up of vehicles to unload at the sidewalk have to be stopped.

Traffic Control Is Essential*

Unrestricted Parking Has Become Such an Evil that It Must Be Curbed if Streets Are to Serve Best—Electric Railways and Local Chambers of Commerce Can Co-operate to Improve Conditions

BY FRANK R. COATES
Vice-President Henry L. Doherty & Company
President American Electric Railway Association

TRAFFIC on our streets and highways has increased to such an extent that its proper control presents a problem that challenges the best minds in the nation. It is my privilege to be president of the American Electric Railway Association, and to represent the electric railways at this meeting. There is no industry more vitally interested in traffic problems than ours. The electric railways are operating 80,000 street cars and about 6,500 buses on the streets and highways. They are carrying more than 15,000,000,000 passengers per annum —more than 40,000,000 passengers per day. These passengers are the masses of the people.

There is no conflict of opinion between electric railways and the automotive industry as to the seriousness of the traffic situation, nor any conflict between us and the communities we serve, nor any conflict between us and the steam railroads. I think it is a correct statement that we are agreed that the city traffic problem exists and that it must be solved, or the tremendous losses which were pointed out in the reports of the National Conference on Street and Highway Safety will grow with appalling rapidity. Something more than dollars and cents is involved. The prosperity of the nation, the safety of the public are what concern us most.

AUTOMOBILE NOT FORESEEN

How did this problem arise? It has been only a few years in developing; how does it happen that it now presents a national emergency? The answer is plain. It came about because our forefathers, even the preceding generation, could not foresee the development of the automobile and therefore could not make provision for its demands on street and highway space. Most of our cities were laid out 50, 100 or more years ago. Those who laid them out knew of no kind of highway transportation except horse-drawn vehicles. The electric car, which followed the horse car, had been operating 30 years before the streets were crowded. But about ten years ago street congestion began to attract attention. The automobile was coming into its own. It brought about a demand not only for smoother highways, but for wider ones, for the curbs were being lined with cars.

The thrusting of 20,000,000 unanticipated automotive vehicles into cities and towns which had been laid out and built up by generations which knew only horse-drawn traffic has brought about the terrific congestion which we are now striving to relieve.

*Abstract of a paper before the Transportation and Communications Group, annual convention of the Chamber of Commerce of the United States, Washington, D. C., May 11, 1926.

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The coming of the automobile has not been an unmixed blessing to city dwellers, for it has brought heavy demands upon the pocketbooks of the taxpayers, who are called upon to widen streets and highways, to provide traffic control systems, to increase the police force and, unfortunately, to see to it that there are ample accommodations and adequate staffs of surgeons and nurses in the public hospitals. Despite all this the advantages of the automobile to those who can afford them are self-evident, and I believe that the number of automotive vehicles of all kinds will increase for some time to come.

Assuming that there is to be a still greater volume of traffic on the streets and highways, is it not time for the nation to take cognizance of the situation and begin to provide not only regulation and control, but facilities for the future? Is it not time for every growing community to make a transportation plan?

You are going to have street cars for many years to come; you are going to have more buses; you are going to have more private automobiles. The street cars in the medium and larger cities are carrying more and more passengers. In Chicago the surface lines carried 12,000,000 more passengers in 1925 than they carried in 1924. In New York City the surface lines carried 1,036,000,000 passengers last year, and the rapid transit lines carried 1,680,000,000. The street railways in Milwaukee, San Francisco, New Orleans and many smaller cities carried more passengers last year than they did in 1924.

I cite these facts lest any of you have the thought that the street railway is on the skids. It isn't. I know you'll be pleased to hear me say that the net income of our industry showed an increase of more than 13 per cent last year over 1924. Not only that, but the manufacturers report that they received more orders for cars and buses during the first three months of 1926 than they had in the corresponding months of several years past.

The street cars are going to continue to carry the masses. The buses operated by street railways are going to carry more and more passengers to and from parts of the communities not served by railway lines, necessarily at a higher fare than is charged for rail service, but with transfer privileges to and from the rail lines. These two services are rapidly being co-ordinated. The bus service is becoming more attractive to the owners of private automobiles, who have been finding it increasingly dangerous to operate in crowded streets and increasingly difficult to find places to park their cars.

As street car and bus service develops, provision for its growth must be made not only by the operating companies, but by the communities in which the companies operate, because mass transportation is absolutely essential to the prosperity, convenience and happiness of the people.

Being firmly convinced of these facts, I want to urge the adoption by all communities of the recommendations made by the committee on metropolitan facilities of the National Conference on Street and Highway Safety, especially the recommendation that each community form a voluntary civic committee to study the traffic problem, and looking to the future to provide a transportation plan that will take care of the increase in traffic as it comes about.

I am urging our electric railway people to regard themselves as transportation experts rather than as strictly electric railway experts. The street railway people in every city and town should be so well acquainted with the transportation needs of their communities that they can say just what transportation the community should have. They should have no prejudice for the electric car if the bus would serve the community better; they should not recommend bus service if they know that an electric railway extension would render better service. Their duty is to give the community the best possible expert transportation advice. We have before us two distinct problems —the transit problem and the traffic problem—and certainly no men are better fitted by training and experience to handle the transit problem than the local electric railway men. Nor has any group of men more actual experience to present to any disinterested group, like the local chamber of commerce, that may be charged with study of the traffic problem.

The chamber of commerce should be the clearing house for all local problems. It should be the inspirational center of the community. Under its leadership the greatest good for the community should be accomplished. In this kind of activity, it seems to me, the directors and secretaries of commercial associations can find a wonderful opportunity for service to their communities. What is more important to any city than unimpeded transportation? Our streets are the arteries of commerce, the traffic flowing through them is the lifeblood of the city. Choke the arteries and circulation stops, and if it stops long enough business in the choked district is seriously damaged, if not killed.

A city that is known for its good street arrangement and its good traffic movement is bound to be a more prosperous city and more attractive to industry and commerce than one that has permitted itself to develop hardening of its traffic arteries. And unlimited parking produces just that—it thickens the walls of the arteries and narrows the space through which the lifeblood of business must flow, necessarily at higher pressure and with greater danger to civic life than would be the case were the arteries kept open for their purpose—the free movement of traffic.

I do not know of any panacea for traffic congestion. Conditions are different in different communities. But there is a remedy for conditions in every city. What that remedy may be is for the community to ascertain, preferably through its own committees and experts.

One of the commonest causes of traffic congestion is the parked vehicle, and this is most serious in its effect on street car movement. I do not think anyone will question my statement that the primary purpose of a business street is the movement of traffic. When communities permit automobilists to park their cars along both curbs of business streets, they narrow the street from 12 ft. to 14 ft., they blockade the doors of the merchants, they impede all traffic, they create a serious accident hazard, and they endanger or inconvenience the millions who go and come in the street cars. In addition to all that, they interfere with the movement of fire apparatus, and they turn the public streets into storage places for private property.

There simply isn't room in the streets for the parking of all the automobiles in the country—there must be restriction, or the streets will become impassable. I may be accused of special pleading when I make this statement, but let me remind you again that we street railway men must regard ourselves as the representatives of the masses of the people, and when I make a plea for easier movement of street railway cars through the city streets, I am pleading for the vast majority of the population of this country, for the forty millions that ride the street cars every day in the year.

Were there time, and were this the place, I could show you by statistics gathered from many cities that the street car carries from 80 to 85 per cent of all the human beings moving in the public streets in the rush hours, and that this great volume of street car traffic comprises only 15 to 20 per cent of the total number of vehicles in the streets. Put in another way, what I say is that private automobiles, comprising 80 to 85 per cent of the vehicles in the streets in rush hours, carry only 15 to 20 per cent of the traveling public.

These facts, well known to students of city planning and traffic control,

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 19-20—Central Electric Traffic Association, Hotel Argonne, Lima, Ohio.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

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have brought the suggestion from that distinguished engineer and traffic expert the city manager of Cincinnati that the time is coming when there shall have to be a separation of the necessary from the unnecessary traffic in congested districts. The necessary traffic is the transportation of the people in public service vehicles—the street cars and the buses. These vehicles would be given preference, because they are providing mass transportation in the public service, and under public regulation and control. Following them in order of precedence would be the taxicabs and private automobiles.

I do not expect to see this separation of traffic for some time to come, although I believe it would be to the advantage of the public. Instead, I look for a more disinterested attitude toward the parking and congestion problems on the part of those who in the past have been inclined to suit their own whims and fancies rather than to have consideration for the welfare of the community as a whole. I believe that people whose personal convenience has meant the inconvenience of scores and hundreds of persons not so fortunate as to own a private automobile are going to recognize the inequity of the situation and agree to abolition of parking in streets where there are street railway tracks, and to the reduction of the volume of unnecessary traffic in such streets. There have been some excellent examples of this kind of public cooperation, notably in Pittsburgh, where the merchants and other business men have found by experience that abolition of parking has speeded up the movement of customers to their stores and has increased their business.

Competing Services Waste Space

There is no question in my mind but that there is a tremendous waste of street space by competing services in not a few communities. By all the rules of logic and by all the elements of justice, mass transportation service should be supplied the public by the rail lines. Competition by jitneys, whether they are competing with a city railway, or interstate highway vehicles competing with a steam railroad, cannot be justified, because it is wasteful, and damaging to the public interest.

Co-ordinated street railway and bus service is now being rendered by nearly 300 electric railway companies. The railways have found the bus to be an efficient supplementary vehicle, with which they can give service to parts of the community not yet sufficiently developed to warrant construction of rail lines, or to serve parts of the community with what we call de luxe service, that is, a seat for every passenger in vehicles with the most comfortable kind of seats, operating on an express schedule. The principle of co-ordinated service is sound, and is being carried to its logical conclusion in some of our cities, notably Philadelphia, where the rapid transit company is operating not only the rapid transit and street car lines, but the buses in city and suburban service, and the taxicabs as well. Such co-ordination makes for efficiency, economy and public satisfaction, and in addition to all that, makes possible adjustments of routes to aid in reducing congestion in the streets.

Trends in Motor Vehicle Legislation Discussed

CHANGES recently made in laws governing the operation of motor vehicles were outlined before the annual meeting of the National Highway Traffic Association at New York on April 30. According to Russell Huffman, secretary Motor Vehicle Conference Committee, license fees have gradually increased, particularly those for buses and trucks. There has been a marked tendency also to increase the gasoline taxes. The allowable widths of buses and trucks have been decreased, and there has been a tendency to reduce the gross weight allowed. With reference to speed, the trend has been to permit a much higher rate.

Common carrier vehicles are being more and more regulated by the state governments, he said. Equipment of motor vehicles, such as lights and brakes, have been receiving considerable attention at the hands of legislators. So far as enforcement goes, the tendency has been toward heavier penalties.

Mr. Huffman called attention to the growing desire on the part of state public utility bodies to increase their jurisdiction over the physical operation of vehicles. In this they are taking over functions formerly left to the motor vehicle departments of the state. At present, three-fourths of the states have enacted laws regulating widths and heights of motor vehicles. The greatest width permitted is 108 in. and the narrowest is 84 in. Most of the states have fixed the width limit at 96 in. and the height at 12 ft. 6 in. Weight limitations range from 30,000 to 18,000 lb., the average being about 24,000 lb. A noticeable movement during the past few years has been the tendency to base the weight limitations upon the character of the highway over which the vehicle is to operate. While this has not been enacted into law, several state highway officials are using this method to determine the weights permitted over their roads.

Other papers were presented by M. C. Horine, International Motor Company, New York, on "Highway Safety as Promoted by Adequate Brakes"; by E. P. Goodrich, consulting engineer, New York City, on "High-Speed Highways Required for Economic Transportation," and by Col. I. C. Moller, traffic engineer, Washington, D. C., on "Traffic Control Systems at Street Intersections."

Economizing in Purchases and Stores Department

Methods of Saving Money in Buying and Handling Materials and Supplies Discussed at Lively Meeting of New England Street Railway Club

PURCHASING department representatives, storekeepers and manufacturers' agents combined to make the May 6 meeting of the New England Street Railway Club at Boston, Mass., one of the liveliest in recent months, the topic of the day being how to save money in buying and handling materials and supplies. President F. D. Gordon occupied the chair, and after the usual topical meeting in the afternoon at the Copley Plaza Hotel an enjoyable dinner was held, with addresses by Managing Director Lucius S. Storrs of the American Electric Railway Association, George E. Pellissier, assistant general manager Holyoke Street Railway, and Harry C. White, Edison Lamp Works of the General Electric Company. Messrs. Storrs and Pellissier spoke on making better use of the opportunities afforded by the club and the American Electric Railway Association, while Mr. White gave a spectacular demonstration of high-voltage phenomena, with personal reminiscences of Thomas A. Edison and the late Dr. C. P. Steinmetz.

George E. Haggas, chief engineer Cumberland County Power & Light Company, Portland, Me., opened the afternoon meeting with an account of the success which has attended the combination of purchasing and engineering functions in one department in the past five years. The engineering department's knowledge of the future development of a public utility property qualifies it in large measure to undertake purchasing tasks. This advance information enables rush shipments to be reduced in number, and cuts down telephone and telegraph costs; it enables time to be saved in conferences between departments and in referring matters back and forth. Many interdepartmental letters and "memos" are thereby eliminated. This saves time and enables the company to buy at better advantage in many cases. Overhead costs and so-called "buck passing" are cut down. The company tries to buy in large volumes, pooling daily supplies with construction supplies.

R. S. Baldwin, purchasing agent the Connecticut Company, New Haven, Conn., discussed the value of quantity buying and its relation to market trends. Here the skill of the purchasing agent finds full expression, and upon his judgment much depends. Some kinds of supplies, like those for snow-fighting equipment, belong in the seasonal class and others, like pipe, fittings and steel parts, can advantageously be bought on the hand-to-mouth basis. Mr. Baldwin said that his company takes all cash discounts offered and saves about $36,000 per year by so doing. It is the company's practice not to disclose bids to competitors, and in general the "last" price is quoted at the outset. In the main it is better to buy standard material than to manufacture supplies in railway company shops, though this should not be an ironclad rule. Unless a very substantial saving results, company manufacturing is unjustifiable.

F. A. Barbey, Boston, in discussing the foregoing papers, commended the pioneer work of the Canadian Pacific Railway in establishing the authority of the purchasing agent as an executive buyer. He criticised the policy of tak-

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ing cash discounts in view of the low price at which money can be borrowed, and pointed out the futility of trying to keep prices secret from the trade. George E. Pellissier, Holyoke, cited the excellent co-operation obtaining in his company between the engineers and purchasing staffs. James Alexander, Westinghouse company, New Haven, Conn., said that his company's cash discounts in general are given to buyers with lesser credit stability, although certain classes of merchandise and supplies carry cash discounts available generally. Mr. Baldwin does not figure the cash discount in comparing prices and bids, but regards it as a premium.

Advantages and Disadvantages of Quantity Buying

Storeroom practices was the subject of a paper by W. F. Crowe, secretary Springfield Street Railway. Mr. Crowe told how the methods used by his company and by the Worcester Consolidated Street Railway had been modified during the past six years and of the advantages which had resulted from the change. The present system was described in detail.

Under the procedure of this plan the storekeeper, being in need of material, places a requisition with the purchasing agent and after it has passed through the regular channels and received the necessary approvals, the purchasing agent arranges for the purchase of the material and issues his regular order, a copy of which is sent to the storekeeper. The latter notes on his copy of the requisition the order number and on his stock card indicates the date, requisition number and quantity ordered. When the material is received, the copy of the purchasing agent's order is used as the receiving record, on which is indicated the material received, etc., and passed along to the storekeeper as his record of material received for that day or under a particular order and is used by him in approving, checking and passing the invoice for the material received. After the storekeeper has certified on the invoice as to the quantity, quality and weights of the material received, this information is recorded on the stock card and the unit cost to be used in charging out that particular lot of material is determined, and the invoice forwarded to the manager for approval and return to the purchasing agent, who, after noting his records, forwards the original bill to the company's office for payment.

R. A. Weston, special accountant the Connecticut Company, told how the physical arrangement of material in the storeroom influences the buying of supplies. He suggested that the purchase order should originate at the bin in the storeroom.

"To do this we must have our material in such shape that we can count and inventory it at a glance and without handling," he continued. "This may mean revolutionizing your storeroom, but it can be done and it will be found to pay. Build open shelving. Pile your materials on the shelves in what is known as the 'unit piling' method. Make everything work toward visibility. You will find that you can concentrate your materials in much less space because of the greater flexibility of the system.

"Briefly, the 'unit piling' system consists in designating so many pieces of material, as they are being placed in stock, as a unit. This may be 5, 6, 10, 12, 50, 100, a gross, etc. Then as the material is stored it is separated in some manner so that each unit contains this designated number of pieces, and each such unit is in some way separated from the other units of the same material as to be plainly discernible, so that in taking stock the stockman simply counts the units and not the items."

T. H. McGarry, purchasing agent, explained how the Eastern Massachusetts Street Railway inaugurated a monthly budget system of ordering materials and supplies some five years ago. Prior to this time materials and supplies were requisitioned by two general storekeepers, one north of Boston, and one south of Boston, on a maximum-minimum stock basis. Materials and supplies so requisitioned and purchased were delivered to the three storerooms, and then distributed to various parts of the system from these storerooms. With the inauguration of the budget system this procedure was changed; now materials and supplies are in general delivered directly to each of the operating districts and shops.

On the twentieth of each month, the Boston purchasing department receives budget requisitions from the seventeen operating units. These requisitions are presented on printed forms and indicate the quantity of material required, the quantity on hand at the time requisition is issued, monthly consumption, also the use to which the material is to be put. The material covered by these budgets, unless of a special nature, is generally purchased and shipped the early part of the following month.

These monthly budget requisitions are originally prepared by the foremen of the several sub-departments, such as rolling stock, track, power, line, bus and truck and office supplies. The requisitions so prepared are carefully reviewed by the managers who are primarily responsible for the quantities ordered. In the case of the two shops, the superintendent of rolling stock and shops is responsible for all materials requisitioned, and the superintendent of the Quincy Point power station is responsible for that station's budget, and also for the Quincy automotive service station requirements.

In the opinion of the management the placing of responsibility for the requisitioning of materials and supplies with the department heads and managers has enabled the company to reduce its materials and supplies investment account materially.

Quantity buying in anticipation of future needs may mean prohibitive prices eventually because of obsolescence and other items making up carrying charges, according to W. W. Tirrell, statistician, and formerly examiner for the Interstate Commerce Commission. Some commodities deteriorate rapidly. Much material is carried from inventory to inventory, indicating unserviceable material in stock.

The purchasing department is not always responsible for quantity buying. Requisitions are drawn, frequently, too far in advance of actual requirements, and for excessive present quantities considering the prospective length of the work or job. Central control of stores operations curbs the desire of the under-official for large supplies to be kept constantly in stock. One control, held responsible for adequate supplies in stock, has worked well in the steam railroad field, wherever applied. A five-year comparison clearly demonstrates the benefits accruing under central control.

Stores budgets which place limits on the value of requisitions which can be issued each month have worked out well in the steam railroad industry, according to A. A. Ordway, purchasing agent Boston Elevated Railway. He thought, however, that they are too complicated and require too much bookkeeping to be satisfactory for electric railways.

Other contributions to the discussion of the subject of purchases and stores were made by A. B. Fuller, purchasing agent Union Street Railway, New Bedford, and W. F. Maher, storekeeper United Electric Railways, Providence. Abstracts of these papers will appear in a future issue.

Managing Director Storrs of the A.E.R.A. commended the increase of club members from the automotive industry in opening his address at the evening session. He emphasized the great value of round-table discussions to the industry and pictured the increased breadth of outlook derived from seeing how neighboring properties meet their problems. Group meetings and discussions as practiced by the Central and California association members are helpful and deserve wider application. The possibilities of building revenue on interurban railways from freight service were stressed. Regular meetings of operating men to discuss statistics of service rendered, costs, etc., offer helpful opportunities for betterment of practice on individual roads. A free interchange of ideas, the speaker said, is preferable to sluggish movement of thought resulting from excessive pride in their authorship. The industry would gain by reading more, Mr. Storrs declared. Closing, he outlined the activities of the A.E.R.A. headquarters staff and urged his hearers to call upon the New York office for help at all times.

Mr. Pellissier told how the New England Street Railway club could be made of more value to its members. His recommendations included the display of more interest by the railway executives, more definite objectives, and certain changes in method of electing officers.

Central Traffic Association Changes Meeting Place

CENTRAL Electric Traffic Association will hold its next regular meeting on May 19 and 20 at the Hotel Argonne, Lima, Ohio, instead of at Fort Wayne, Ind., as previously planned. This change of meeting place is due to the fact that hotel accommodations could not be secured at Fort Wayne on the dates mentioned.

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Canadian Convention at Quebec June 2-4

BEAUTIFUL Château Frontenac, overlooking the St. Lawrence River in the city of Quebec, will throw its doors open to celebrate the 22d birthday of the Canadian Electric Railway Association. The meeting will be held jointly with the Canadian Electrical Association on June 2-4. Regular business sessions of the two associations will be held separately; but both will meet in the Dominion Drill Hall on Grande Allee, where also the manufacturers' exhibits will be shown.

The entertainment committee includes in its many diversions a golf tournament to be held at Kent links, a trip to Ste. Anne de Beaupré, a dinner and dance at Kent Hall, and a grand final ball at the Château.

William S. Hart, president of the Canadian Electric Railway Association, will preside at the meetings. The two papers to be presented are: "The Motor Bus in Urban Transportation," by Dean J. Locke, staff engineer Public Service Railway, Newark, N. J., and "Budgetary Control for Electric Railways," by H. C. Patten, comptroller Toronto Transportation Commission, Toronto, Canada.

In addition to these papers, special arrangements have this year been made for the discussion of six topics of general interest. Two of these topics will be discussed each day and two specially prepared five-minute talks will be the means used in presenting these subjects to the meeting.

The subjects are: June 2, "Transfer Tickets," J. McCulloch and C. M. Shaw; "Sweepers," F. D. Burpee and A. M. Lindsay. June 3, "Schedule Speeds," G. E. Waller and A. J. Tobin; "Armatures," A. M. Lindsay and D. Chenard. June 4, "Paving," A. T. Spencer and T. U. Fairlie; "Car Painting," F. S. Beattie and F. E. Holland.

American Association News

"Peddlers Do Their Stuff"

PEDDLERS held sway at the fifteenth regular meeting of the Metropolitan Section of the A.E.R.A., on the evening of May 7. The announcement of the meeting said that "free rein will be given to the peddler's spirits," and so it turned out. Horace Sisson presented "The Tough Life of a Peddler," movingly illustrated. The captions to the pictures portraying a day in the life of the peddler contained many wise cracks, but the film itself was somewhat weak in spots. The peddler is supposed to be a contrite mortal who waits in fear and trembling outside the office of the P. A., but in this case he hobnobbed familiarly with the railway officials until one began to wonder which of the two personages owned the Rolls Royce in which the two drove away together.

W. H. Woodin, president of the American Car & Foundry Company, was down on the program for the principal address, but he was prevented from attending. A letter of regret from him was read by Fred Harper. Mr. Woodin said in short that the manufacturer was a co-partner of the railway man. Each man's problem was the problem of the other.

Transportation must be made more desirable and more salable. He ran the gamut of all the trials and tribulations of the railway and drew a picture of the difference between the sales efforts of the manufacturer and the transportation company. Fresh and modern equipment is absolutely necessary. The silent transportation salesman is the car or the bus. One problem always remained, namely, that of selling the service whatever it may be. The manufacturer is the operator's silent partner —he can prosper only as the operator prospers.

President Hulme of the Metropolitan Section turned the meeting over to Jerry Stanton to conduct. Before doing so, however, Mr. Hulme said that the annual outing would be held at Pelham Bay Park on Aug. 11. Mr. Wheeler, chairman of the entertainment committee, had informed Mr. Hulme that only 400 could be accommodated at the dinner that day, so the need was imperative to get reservations in early.

The evening was concluded with a talk by Capt. Irving O'Hay, the original "Soldier of Fortune." He is one of the men on whom Richard Harding Davis based his book "The Soldier of Fortune." Captain O'Hay talked for one hour and forty minutes and there were not two dull minutes in his discourse. His remarks were packed with wit, wisdom and satire. The burden of his remarks was that it does not pay to take things too seriously.

Public Service Reorganizes Company Section

AFTER an interval of eight years, during which no meetings were held, the Public Service Railway Company section of the American Electric Railway Association has been reorganized. This section is the second oldest of the company sections and was very active until 1918, when the emergency conditions resulting from the World War necessitated a suspension of its activities. In answer to the call of M. R. Boylan, vice-president in charge of operation, nearly 400 old and new members met in the assembly room of the Public Service Terminal Building, Newark, N. J., on May 6 and reorganized the section.

Short talks stressing the value of the activities of company sections and expressing high hopes for the success of the new Public Service organization were made by C. E. Morgan, vice-president and general manager Brooklyn City Railroad; J. W. Hulme, assistant superintendent of equipment Interborough Rapid Transit Company; J. W. Welsh, executive secretary American Electric Railway Association; J. W. Colton, editor *Aera;* Labert St. Clair, publicity director American Electric Railway Association; Guy Hecker, special engineer American Electric Railway Association; H. C. Eddy, street railway engineer Board of Public Utility Commissioners of New Jersey; J. A. Miller, Jr., associate editor ELECTRIC RAILWAY JOURNAL, and Harlow Clark, director of publicity Public Service Railway.

Officers of the company section chosen for the coming year were: President, A. T. Warner, assistant to the vice-president in charge of operation; vice-president, Philip McGuire, manager Central Division, and secretary, Joseph O'Driscoll, bookkeeper, accounting department. Directors chosen were J. M. Symington, manager Essex division; J. E. Rutledge, manager Passaic Division: W. H. Shepard, manager Hudson Division; M. R. Boylan; vice-president, director ex officio.

It was decided to hold a series of meetings, possibly one in each of the operating divisions of the company. Refreshments were served at the conclusion of the meeting.

Special Reports Available

FOLLOWING is a list of special reports that have been prepared by the Bureau of Information and Service of the American Electric Railway Association. They are available to member companies upon request.

Bulletin No. 77: Electric Railway Operations in 1925.—Contains statement of the revenues, expenses, net revenue and passenger traffic of 327 railway companies and 96 affiliated bus undertakings in 1925, in comparison with the same items in 1924. Also gives complete comparative analysis of the operations of 221 railway companies classified into city, interurban and combination city and interurban companies with each group further classified into three smaller groups according to the size of the company. For each group there is shown a complete income statement, details of operating expenses, operating statistics and derived ratios and unit figures for comparison.

Bulletin No. 78: Bus Operations of Electric Railways in 1925.—A summary of the analysis of the bus operations of 92 electric railways and a tabulation of the individual returns of each company with certain of the more important figures shown on unit basis for purpose of a more accurate comparison. In addition, it contains combined statement of a large group of companies that reported detailed operating expenses and statistics showing a complete detail of expenses, passengers carried, bus-miles operated, gasoline consumed, and complete schedule of buses operated showing the seating capacity and a summary of the methods of depreciation on buses adopted by the various companies.

Bulletin No. 79: Special Factors Affecting Working Conditions of Electric Railway Trainmen.—A compilation of information covering a number of miscellaneous conditions such as status of workmen's compensation laws in the various states, employee representation systems, pension systems, requirements as to physical examinations, mutual benefit associations, establishment of recreation rooms, union membership and labor turnover during 1925.

Bulletin No. 80: Use of Reduced Rate Tickets.—An analysis of the effect of varying reductions from the cash fare on the proportion of reduced rate tickets used. For each company there is shown the cash fare and the ticket rates and then the percentage of revenue passengers paying cash fares, using the various ticket rates or traveling on a weekly pass where there is a weekly pass in effect.

In addition to the above, the following supplements have been prepared, bringing the information they cover, down to May 1:

Supplement No. 2 to Trainmen's Wage Bulletin No. 69.

Supplement No. 2 to Busmen's Wage Bulletin No. 70.

Supplement No. 8 to City and Interurban Fare Bulletins Nos. 40 and 41.

Cost of Living Studies (Bulletin No. 81).

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The News of the Industry

New York Governor Hears Opposition to Bus Bills

Charges that sinister influences of an unknown origin are behind the Sargent and Thayer bills amending section 54 of the public service commission law so as to prevent a stagecoach corporation from acquiring more than 10 per cent of the capital stock of a street railroad corporation without the consent of the Public Service Commission were made by Assistant Corporation Counsel Gregory U. Harmon of Buffalo at a hearing held before Governor Smith on the two bills on May 13. "We don't want the International Railway to be owned by a bus line," declared Mr. Harmon. "Now they are operating both cars and buses, but as two separate companies, and their finances are separate and distinct." Representatives of organized labor from Buffalo also opposed the bills. Governor Smith stated that as he understands the matter the purpose of the bills is to get the same control over a bus company that tries to buy a street railroad as a transportation corporation acquiring the capital stock of another transportation corporation. "At the present time," said the Governor, "there is no regulation over a bus company buying stock of a street railroad company. This bill fixes it so that regulation is had the same as applies to other corporations."

It was also pointed out that at the present time a bus corporation organized as a business corporation and not under the transportation corporation law might acquire with no restriction the entire stock of a street railroad company. The Governor closed the hearing after the opposition had finished.

The Thayer bill and Sargent bill are different in that while the Sargent bill provides that bus corporations organized pursuant to the transportation corporation law shall be subject to its provisions, the Thayer bill provides that a corporation, however organized, shall be so subject to the public service or transit commission. The Fifth Avenue Coach Company is not organized under the transportation corporation law, but under the Thayer bill in the purchase of stock of a street railroad company would be subject to its provisions.

Elevated Men in Chicago Want More Pay

Five thousand employees of the Chicago Rapid Transit Company voted on May 8 to ask an increase in wages of 5 cents an hour when their present contracts with the company expire on May 31. They also request that a $1,000 death benefit and a weekly sick benefit of $20 be established at the expense of the company.

The new scale, if granted, would give motormen a maximum of 82 cents an hour, conductors 77 cents, guards 75 cents and proportionate raises in the wages of all shopmen, station employees, porters and trackmen. According to officials of the local union, the increase would re-establish the maximum rate prior to the 1922 reduction, thereby increasing the company's annual wage bill by $880,000.

Similar wage demands were made by train service employees of the Chicago Surface Lines at a meeting on May 3.

Service in Akron Restored to Normal

Railway There Believes Strike to Be Broken—Buses Play Big Part in Helping Company Free Itself from Union Domination—Interurbans Going Back Into Service

STREET CAR service has been restored to normal both day and night on the Akron city system of the Northern Ohio Power & Light Company. The Amalgamated Association has lost control and all trainmen now working have signed individual contracts. The Canton city situation is practically cleared up and the union control there broken. Complete day service has been restored in Canton and night service will be back to normal in a few days. No attempt has been made to operate interurban cars, but the company is determined to throw off union domination on its entire interurban system from Cleveland to Uhrichsville.

Buses and a satisfied public won the fight. At one time the company was operating 227 buses in city and interurban service. With these buses, aided by the few street cars that were manned by loyal trainmen, the riding public was fairly well accommodated. At any rate, they were so well satisfied that many openly expressed the hope that "the company would not compromise this time, but fight it out."

Along the entire interurban system, as well as in the cities, the company is receiving full public support. There probably has never been a strike of the magnitude of this upon any electric railway property where the public supported the company as it has in this instance in northern Ohio.

Hugh D. Friel, U. S. labor commissioner, who attempted to bring about a compromise, admitted in the newspapers that he had "never found such an apathetic public."

In Canton an attempt was made to secure the passage of an ordinance requiring the company to train men twenty days in the city before they could operate cars. The City Council laid the ordinance to rest in the judiciary committee.

In making the fight, the company's first step was an announcement that the "unwarranted strike had been called by a Mr. McMorrow of the Amalgamated Association without notice to the company or the public," but that "the company would operate all the cars possible and get additional buses without delay." The public was asked to have patience. The public said, in effect: "Fine, go to it, we have had enough street car strikes, so end them for all time."

The contest was staged in Akron City, the remainder of the system standing practically idle. The company announced in a public advertisement that it was "through with the Amalgamated Association" and that it "would not deal with union representatives." Day by day the Akron city service was built up. Starting with the Rose Avenue-Lakeside line, the Main Street and East Market lines were added. When full day service was restored on one line another was started. Thus was complete day service built. Following this, the work of bringing the night car service back to normal began. This was handled in the same manner as the day service. Ten days after the strike was called service was back to normal in Akron.

After Akron service had been restored, the company turned its attention to Canton, where enough loyal trainmen were voluntarily working to supply 50 per cent normal day service and more men were being trained. Starting with eleven runs that dropped off late in the afternoon, lines were added one by one and complete night service finally was established Thursday night of this week.

COMPANY PLANNING AHEAD

The work of restoring Massillon city service is now going on. The work of restoring interurban service will begin on May 17. This will be handled by divisions, the first to be taken up being the division south of Massillon, where there has been but little service.

The strike has been attended with very little violence so far. Bricks were thrown through the windows of several cars and buses. Shots were fired into a Barberton car, and one motorman and one bus driver were injured. Long tacks held upright by thin cardboard were strewn along bus routes, but patrols found them before much damage was done.

Approximately 100 interurban shopmen have been laid off since the strike started. They were in the Silver Lake Junction, Massillon and Dover shops.

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Additional bus repair men have been employed.

For the last fifteen years, car riders in Akron and other parts of the Northern Ohio Power & Light Company's system have suffered from strikes. These strikes have lasted from one to eleven days, after which Amalgamated Association officials would bring about a settlement at the expense of the company. This time the company decided to fight it out with the union and establish the open shop policy under the individual contract system.

Last-minute messages state that the situation is satisfactory, with complete service in Akron and practically complete in Canton. No effort has been made to operate the interurbans and no effort will be made for perhaps another week. The buses are handling the interurban passengers satisfactorily. Efforts by the Amalgamated Association to bring about mediation and recognition of the union have all failed, with the public standing behind the company. Evidences of violence have been slight—an attempt was made to dynamite one of the company's high-tension lines and one motorman in Cuyahoga Falls was injured when a brick was thrown through a car window.

Bureau of Public Utilities Formed

The Research Bureau of Public Utilities was recently organized, with offices at 11 East 36th Street, New York, N. Y., by the National Association of Mutual Savings Banks to supply banks in all parts of the country with information on public utility bonds. This is the first of this kind of bureau, the formation of which resulted from action taken by the National Association of Mutual Savings Banks at its convention in Poland, Me., last June. A committee then was named to recommend action on the establishment of the bureau. The committee consulted with a group representing 30 public utilities and financial houses interested in public utilities.

New Subways in New York Face Delay

At an executive meeting of the committee of the whole of the Board of Estimate of New York on May 7 it was found that available funds would fall at least $50,000,000 short of the requirements for the fulfillment of the contracts already made or contemplated by the Board of Transportation for subway construction.

Members of the Board of Estimate pointed out that to raise all this money would not only preclude the carrying out of many urgent public improvements to which the Board of Estimate is committed, but would carry the city far beyond the constitutional limit of its borrowing capacity.

The suggestion was made as one ray of hope, in financing the subway plans, that part, at least, of the required funds would have to be raised by taxation, by putting it in the annual tax budget, which would probably mean a material increase in the tax rate.

John H. Delaney, chairman of the Board of Transportation, insisted the city must reserve $100,000,000 to carry out the subway construction program for the balance of the calendar year. He was informed by Comptroller Berry that all that it is possible to allocate for subway construction for the balance of the year is $50,000,000. Chairman Delaney insisted that the $100,000,000 would be absolutely necessary to meet the contracts to be awarded this year.

Franchise Nearly Ready

New Grant at Richmond to Go Before City Council for Final Action — Bus Measure Separate

Sitting for nearly two hours on May 3, and revising every section of the proposed blanket franchise, the streets committee of the City Council of Richmond, Va., completed its work, and the document, approved by every member, has been forwarded to the Common Council. That body fixed May 13 for disposition of the ordinance.

At the conclusion of the committee session Chairman Ordway Puller took occasion to thank his colleagues for the valiant and tireless service they had given to the work just completed. For more than three years this committee has considered this measure. It has gone into every phase of the situation and considered every angle and believes the grant is satisfactory to the people.

W. E. Wood, vice-president of the Virginia Electric & Power Company, also expressed his appreciation of the work of the committee since his association with its members. He said:

> We have the interests of Richmond at heart as much as the members of this committee or the most humble citizen, and we shall strive to carry out faithfully all the requirements of the franchise, and go even further when it looks like the city may gain in prosperity and progress through our efforts, feeble though they may be.

The plans of the company for the expenditure of $1,500,000 in the purchase of buses and other equipment and for extensions to the present railway system will be carried out as rapidly as possible, and the unification of the railway and bus lines accomplished with equal speed. Mr. Wood said:

> Now that the franchise has passed the committee and the road ahead seems clear, I wish to say for the company that we will not only live up to every stipulation contained in it, but that we will do so as rapidly as possible. The company is not looking for loopholes in the franchise, but for its speedy passage so that we can carry out the plans for the improvement of the local service that we have drawn up and which were presented to the committee.

The passage of the franchise through Common Council does not entirely clear the way for the unified bus and trolley system, as the city must adopt a bus ordinance, separate and distinct from the franchise, before the trolley and the bus lines can be unified.

When the matter was first broached the inclusion of the bus lines and the street car system into one franchise was considered and was agreeable to the power company. The city assumed the attitude, however, that to include the buses in the blanket franchise would be to place them under the control of the Virginia State Corporation Commission, as the railway system now is. By providing for them under a separate bus ordinance their control would still be in the hands of the city.

Express Car and Local Bus Service in Oakland and Berkeley

Application has been made by the Key System Transit Company to the City Councils of Oakland and Berkeley and to the California Railroad Commission for permission to operate express service on the Telegraph and Shattuck Avenue car lines with a parallel local bus service. In other words, the trolley cars will provide the speedy service to and from Oakland and Berkeley, while the buses will provide the slower means of transportation. If the application is granted and if the plan proves successful traffic in the East Bay cities will be revolutionized.

This is a reversal of the original plan, which called for express bus service between the two cities for a 15-cent fare. Under the new plan the fare will be the same as now charged all over the East Bay—7 cents.

J. P. Potter, general superintendent of the Key System Transit Company, is the father of the new plan. He and other officials of the company believe it will prove so successful that it will be extended to other lines and may be tried in other cities where rapid transit is becoming a problem.

It is proposed to reduce the running time of the street cars by a skip-stop schedule. Only eight stops will be made between Seventeenth Street, the heart of the business district in Oakland, and Alcatraz Avenue in Berkeley. It is estimated that the express trolley cars will cut down the running time from 28 to 21 minutes.

The express service will be supplied between the hours of 8 a.m. and 9 p.m. daily. Before and after those hours and on Sundays the schedule will be as at present.

Speaking of the proposal, General Manager George H. Harris said that the original suggestion of an express bus service was reversed after a study of conditions and in the interest of keeping present schedules.

Report Soon on Power for Rochester Subway

Power other than electricity may be used for hauling freight on the subway built by the city of Rochester, N. Y. This was indicated by the action of the Board of Contract and Supply when it rejected all bids for the overhead wiring. It is thought that either gasoline or oil burning engines will be used.

The subway is expected to be opened in the fall. It bisects the heart of Rochester and is built in the abandoned Erie Canal bed. Plans for its operation are still undecided. The project was put through at city expense, but municipal operation is believed to be a remote possibility. It is thought that some carrier, probably the New York State Railways, will operate the line under a lease.

Besides providing freight service for scores of industries, the new railroad will take the interurban cars off the streets of Rochester and provide limited passenger service from outlying sections into the business area.

A committee of citizens is expected to report.

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Fare Hearing in New York State Adjourned

After completion of cross-examination of the witnesses of the New York State Railways by the city of Syracuse on May 13 an adjournment was taken by the Public Service Commission in the Syracuse rate case to a date to be announced later. Two days were consumed in cross-examination.

Franchise Discussion Renewed in Chicago

If the action of the committee on local transportation is ratified by the City Council of Chicago a clause providing for the construction of 30 miles of track extension by the Chicago Surface Lines every year for five years will be inserted in the Chicago traction ordinance recently drafted by Corporation Counsel Busch. Although the company has been unable to comply with the provision for several years, the present franchise calls for 23 miles of extensions each year.

Since they returned on May 6 from a ten-day tour of inspection in a number of eastern and Canadian cities the members of the transportation committee have been holding sessions daily with a view to an early settlement of the present difficulties.

Should the Council approve the essential features of the new ordinance as regards unified operation of all lines and immediate expansion of facilities, etc., legislative approval of the terminable permit plan will be asked of the State Legislature in 1927. Enactment of a law of this kind by the General Assembly would give Chicago home rule, with exclusive authority over all local transportation lines.

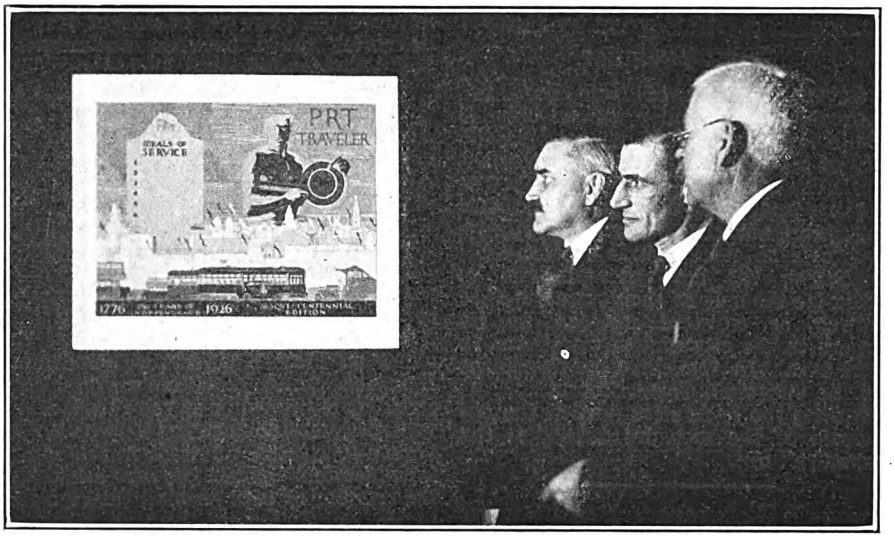
While the committee proceeds to discuss the surface lines ordinance submitted by Corporation Counsel Busch, the work of drafting a separate ordinance dealing with the elevated railway has also begun. The ordinance will provide for certain yearly extensions and for conjunctive operation with the surface lines and the proposed system of subways.

As a result of impressions gained in other cities Alderman Coughlin has submitted a plan, in connection with the ordinance now under consideration, which contemplates the construction of a comprehensive independent subway system based on the special assessment principle.

Electors Vote Approval of Hamilton, Ont., Contract

Hamilton electors voted on May 10 their approval of the franchise agreement between the city of Hamilton and the Hamilton Street Railway. The count stood 14,868 for and 4.768 against. By the terms of the agreement the city is assured of a 5-cent fare until 1928, when either party to the agreement may appeal to the governmental railway board for a change in the fare charge. The city may negotiate for the purchase of the system at the end of any five-year period, while the company undertakes to make many needed improvements to the system.

Abandonment of railway service in Hamilton was threatened in December, 1925, following the defeat of two railway by-laws, one providing for the city's purchasing the system and the other for the granting to the Hamilton Street Railway of a 25-year franchise. Last-minute negotiations resulted in a continuation of the service pending the submission of a new contract to the voters.

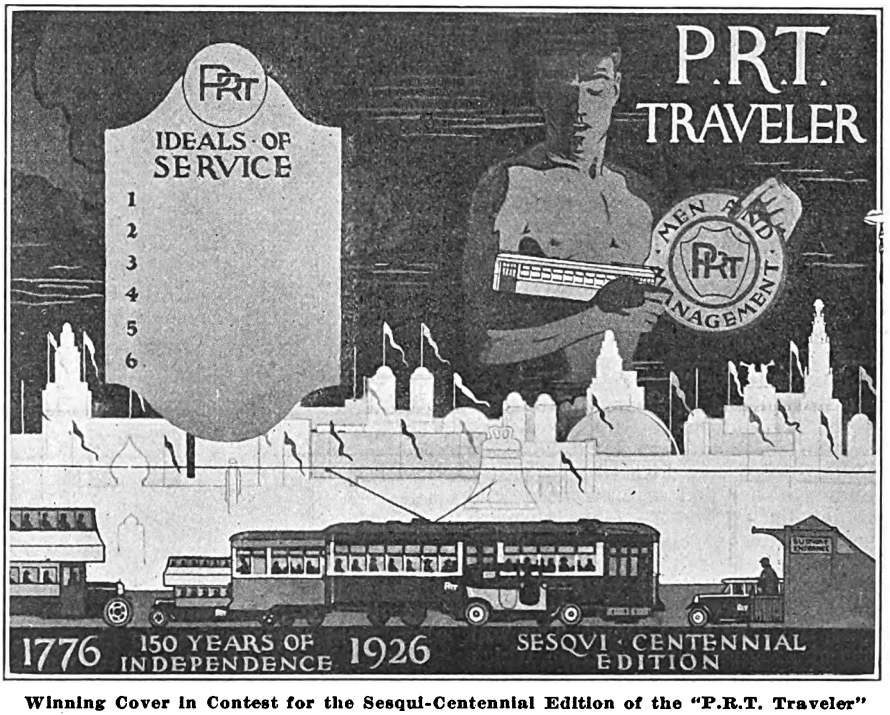


Judges and Winning Entry for the P. R. T. Cover Contest for 1926
Left to right, Ralph T. Senter, vice-president Mitten Management and member of the Art Club; Edward W. Redfield, artist, and Charles Harding, artist.

John J. Gough Wins P.R.T. Award

A Philadelphian, twenty years of age, without any special art training, won the Philadelphia Rapid Transit Company $500 prize for a cover suitable for reproduction in the Sesqui-Centennial number of the *P.R.T. Traveler.* He is John J. Gough, 2224 Christian Street. Mr. Gough is employed in the art department of the Ketterlinus Lithographic Manufacturing Company. He has been with the concern for two years, during which he developed his talent. The prize winner attributes his success to Thomas J. Flanagan of Germantown, an artist who has taken an interest in the young man and has taught him for two years while at the Ketterlinus company. In 1924, Mr. Gough won the second award in the art contest for a cover for the N.E.L.A. program, held by the Philadelphia Electric Company.

In the recent contest honorable mention went to two other Philadelphia artists, Harry S. Moskovitz, 1523 Chestnut Street, and Edward Gammon, 1762 Church Lane, Germantown. The contest was open to any artist in the United States. The rules specified that the design must possess some theme suggestive of the spirit of city transportation in the year of the Sesqui-Centennial International Exposition. As many as four colors could be used. Oils, water colors, charcoal, crayon, pen and ink or pencil designs were acceptable. Several hundred entries were received in this contest from Philadelphia and many out-of-town points.



Winning Cover in Contest for the Sesqui-Centennial Edition of the "P.R.T. Traveler"

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Enabling Bill Signed by New York Governor

Governor Smith of New York has approved the Cuvillier bill as chapter 824 of the laws of 1926 empowering the city of New York for the improvement of traffic conditions in the streets "to acquire and remove from the streets any street surface or elevated railway, and to issue stock, bonds or tax notes to defray the cost thereof, and to authorize the sale of such street surface railway or elevated railroad by its owners to the city and to terminate, in such case, the franchise or franchises for the operation thereof."

During the legislative session the opponents of the measure dubbed it the "mystery" bill.

Denver's Picturesque Road Passes

Some years ago folks in the East, North, South and West were amused at receiving from Denver, Col., a post-card with the picture of a street car showing a horse riding on the rear platform. This was the Englewood-Cherrelyn line. The picture portrayed a true condition of affairs. It was like this. Dick, the horse, would pull the car up the hill from Englewood to Cherrelyn, and returning Dick would mount the rear platform while James O'Brien, the driver, would stand on the front platform so as to be ready to apply the brake. This plan was followed between 1883 and 1910.

Then the road was electrified. Now, in 1926, the cars have been abandoned because the line did not pay. Buses were placed in service on May 5.

First Run of Electrified System

A trial run was made recently on the newly electrified suburban service system of the Illinois Central Railway, between 75th Street, Chicago, and Kensington. The railway already has 130 motor-equipped coaches to be operated each with a trailer in two-car units, which may be coupled up into trains of ten-car length when needed. The work on the trolley wires from 39th Street north to Randolph is now being completed.

Freight Trains in Indiana Relieve Airplane Service

Two new freight trains are announced by the Union Traction Company of Indiana. One train leaves Wabash daily at 2:35 p.m., running via Marion and Anderson to Indianapolis, providing next morning deliveries from those points. The leaving time at Marion is 3:30 p.m. Morning freight service from Marion and Wabash will be continued. The additional train is designed to handle shipments made later in the day.

Business handled by airplane and Indianapolis - Detroit fast through freight trains is being supplemented with a special advance section which will leave Muncie daily at 5:30 p.m., running directly through to Fort Wayne, Ind., and Lima, Ohio. This will relieve the regular airplane train, which leaves Indianapolis under the new schedule at 5 p.m. and is expected to improve the growing overnight freight deliveries made between Indianapolis and points in Ohio and Michigan.

Officials of the Union Traction also announce a new schedule on the Anderson-Wabash line, designed to afford better connections at Anderson, Alexandria and Wabash.

Extensive Rerouting in Detroit

A rather extensive rerouting plan which has been under consideration for some time by the Department of Street Railways at Detroit, Mich., was put into effect on May 1, affecting Woodward, Jefferson, Brush, Hamilton and Oakland cars. It is the belief of the Street Railway Commission that the new plan will relieve congestion of traffic in the downtown section. Under the new schedules the number of cars passing through the block on Jefferson Avenue between Woodward Avenue and Griswold Street during the peak hours will be reduced from 286 to 70. On the southbound trips the Brush cars run south on Hastings Street to Farnsworth Avenue, west on Farnsworth Avenue to St. Antoine Street and south on St. Antoine Street. The changes in these latter routes were necessitated by the opening of the new plant of the American Car & Foundry Company on Russell Street, additional service being required to care for the employees of this plant. This is only one of the many changes, but it is typical in that it illustrates the ends sought to be achieved.

Stops Eliminated in Atlanta as Transit Aid

More than 500 eliminations and changes in stopping places on the railway system in Atlanta have just been put into effect under order of the State Public Service Commission following a petition of the Georgia Railway & Power Company. The changes involve the elimination of 345 of the present street car stops, the moving of 144 stops and the creation of 51 new stops on more than a score of routes operated by the company. They come as the result of a movement instigated more than two years ago when the city engaged the services of the Beeler Organization to survey and report upon transportation conditions in Atlanta. For the past six weeks the commission has been conducting hearings on the proposed stop changes, and in addition to studying the Beeler report has had its own consulting engineer go over most of the proposed changes.

In its preamble to the order making the changes effective the following benefits are enumerated by the commission to be derived by the changes:

1. Reduction in running time between 10 and 12 per cent.
2. Reduction in actual number of cars required for given frequency of service from 8 to 10 per cent.
3. Saving of 10 to 12 per cent of car-riding time.
4. Reduction in accidents of all kinds by actual records 33⅓ per cent.
5. Reduction of 8 to 10 per cent in power consumption.

The Public Service Commission states that it will give further consideration from time to time to any complaint made upon the part of the public after sufficient time has elapsed to determine the merits of each change.

Betterment Plans for St. Louis Traffic Awaited

E. R. Kinsey, president of the Board of Public Service of St. Louis, Mo., announced on May 6 that conclusions on the city's whole rapid transit problem would be reported in about three weeks. President Kinsey made this statement following a conference for harmonizing various plans for improvement of the city's traffic situation, both street car and vehicular, in its congested districts.

A special rapid transit committee of the Board of Aldermen has been considering the rapid transit question for more than a year. A subway for downtown St. Louis with elevated lines leading to outlying sections has been suggested.

Advertisements to Flourish in Oakland

The city of Oakland, Cal., has lost its fight to keep advertisements from the outside of street cars. Judge Warren V. Tryon, in the Alameda County Superior Court, has sustained an injunction against the ordinance recently passed by the City Council of Oakland prohibiting the advertisements. The judge ruled that the Council exceeded its police powers when it passed the ordinance on April 8. The Key System Transit Company and the Pacific Railway Advertisement Company the next day applied for the injunction.

The advertising company showed that it had spent $8,000 to prepare street cars for exterior advertising and that it held a contract with the Key System whereby the latter would be paid $40,000 a year for the use of the cars, and further that its contracts with other advertisers would be nullified if the ordinance were allowed to stand. The ordinance was declared confiscatory.

Judge Tryon in his ruling declared that the city of Oakland was empowered to pass ordinances against any plan of advertising that endangered the peace and safety of the citizens. He admitted that the advertisements in question were not pleasing to the eye, but the æsthetic was not a consideration in deciding what constituted the peace and welfare of the citizens.

Accident Prevention Bureau in Brooklyn Formed

An accident prevention bureau has been organized by the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., to assist the surface transportation department in the reduction of accidents. The work will be supervised by a committee consisting of W. S. Menden, president; George D. Yeomans, general counsel; William Siebert, superintendent of surface transportation. A. T. Brophy will act as secretary of the committee. Alfred H. Marsh has been appointed supervisor.

The full co-operation of every one is sought, in an effort to bring about the success of this movement. Each employee has been informed of the purpose and aims of the bureau. In a statement to the men it is said that only by the exercise of the greatest care in the operation of surface cars can the number of accidents be reduced.

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Maine Road Threatens to Compete with Electrics

Objection has been raised to the plan of the Boston & Maine Railroad to supplant some of its local trains out of Portland, Me., with bus service. The railroad's idea was to run buses over highways in a roundabout way to its stations. This would put it in competition with the local railway lines of the Cumberland County Power & Light Company and call for the use of buses over roads which are hardly passable at some seasons of the year. Among the objectors are community loving individuals who seek to point out the danger of the unrestricted bus operated in a territory where satisfactory electric railway service is to be had. Typical of letters of protest against the proposed service was one from a resident of Scarboro. This man pointed out the injustice of the proposed service to the existing agency, fortifying the remarks he made with arguments from experience elsewhere. In conclusion he said:

> Let the Boston & Maine serve its territory and keep out of the C. C. P. & L. Co.'s territory. The people are satisfied with the way that company renders service. The road from Dunstan to Old Orchard through Pine Point is narrow and is in deplorable condition in spite of the fact that it costs the state and town about $1,000 per mile a year to maintain. The taxpayers cannot forever stand this and the extra wear and congestion buses will make. Heavy traffic belongs on steel rails, not on highways. Help us to stand by our electric road and leave room for safe travel on the highways. Let the Public Utilities Commission show whether or not it is for public service.

New York State Men Want 10 Cents an Hour More

Following a vote of the employees of the New York State Railways at Rochester to join with the workers of Utica and Syracuse in a demand for a wage increase of 10 cents an hour, and after conferences between union and railway officials, employees in the three cities were at an early date to ballot on new wage and working terms agreed on in these conferences to supplant the present contract, which expired on May 1. The conditions sought to be imposed are not to be revealed until they are submitted to the employees.

If the men reject the proposal offered in behalf of the railway by President James F. Hamilton, the joint board of the union must appeal to Mr. Hamilton for another conference to draft terms.

The Rochester men had discussed a separate contract, believing that in view of the increased fare in their city, they were entitled to higher pay than the men in Syracuse and Utica, where applications for fare increases are pending before the State Public Service Commission.

The balloting in the three cities will be carried on the same day, but independently. The totals will be pooled. Last year Rochester's adverse vote on the terms submitted by the company was overridden by the combined favorable totals of the two other cities.

The present scale in the three upstate cities is 55 cents for two-man car operators, 57 cents for interurban employees and 60 cents for platform men on one-man cars.

The men voted on May 11 to reject the company's proposal.

News Notes

Fares Remain Ten Cents.—The Illinois Commerce Commission and the Illinois Power Company have reached an agreement under the terms of which the existing fare rates in Springfield are renewed. The basic rate of 6¼ cents for token buyers is maintained, but the sale of family books is eliminated. Cash fares remain 10 cents, with two tokens for 15 cents and eight for 50 cents. Children's fare remains 3 cents.

One-Man Cars Only in LaCrosse.—With the extension of one-man car service by the Mississippi Valley Public Service Company to its north side and Sixteenth Street lines on May 2 the entire city of LaCrosse is now provided with cars of the one-man type.

Will Consider New Line.—The Wisconsin Gas & Electric Company is considering the petition signed by residents of the northeast section of Racine, Wis., and presented to the City Council urging the construction of a car line north from High Street. This line would serve this newly developed section of the city and would eliminate the inconvenience now experienced by residents of this section.

"The Orange Line" Chosen.—In a contest conducted among employees of the Wisconsin Power & Light Company through the medium of its house organ, *Power & Light News*, to secure a suitable name or slogan for use on its cars and buses, "The Orange Line" was accepted as the most popular name. Fred Whitely, local manager of the company, and M. C. Alexander, Madison, divided first honors, each having submitted the same name. The new name will be painted on all cars and buses.

Fares Increased.—A 3-cent increase in fares between Carthage and Joplin, Mo., on the Southwest Missouri Railroad, Webb City, Mo., was recently ordered by the Public Service Commission. The increase, in effect, is added between Webb City and Joplin. The fare between those cities now will be 13 cents instead of 10 cents and from Carthage to Joplin the fare will be 38 cents instead of 35 cents. The 3-cent increase was asked in a petition filed last January after the 8-cent city fare went into effect in Joplin. The claim was based on the ground that the same 8-cent fare rate should apply to the Joplin city zone for traffic from points beyond that zone as well as for traffic within the zone.

Tunnel Proposed for Pedestrians.—A plan to construct a tunnel at the corner of Howard and Lexington Streets, Baltimore, Md., for the use of pedestrians has been submitted to the city officials by Mark M. Hardy, president of the Pedestrian Subway Company of America. The corner involved is the most congested in the business section and is passed by several lines of the United Railways & Electric Company. The proposal made to the city is that the subway be built with entrances and exits at all four corners. The subway also would provide space for stores. Mayor Howard W. Jackson, who heard the plan outlined by Mr. Hardy, requested that the details be put in writing so he could place the subject before the members of the Board of Estimate.

Skip-Stop Plan Extended.—The Winnipeg Electric Company put into effect on May 5 the skip-stop system on the Academy Road line (Broadway) in Winnipeg, Man. The new system will provide that street cars stop at every other street outbound, while on the inbound journey they will stop at every street missed on the outward journey. The system is not new in Winnipeg, but has been used for some years on the busiest car lines. The stops are indicated by white poles.

Hearings on Rerouting Scheduled.—The Maryland Public Service Commission has set June 1 as the date to open the hearings on the rerouting of the cars of the United Railways & Electric Company, Baltimore. The application for an order requiring the United to make the changes is sought by the Baltimore Traffic Survey Commission. The proposed changes are contained in a report of the traffic commission made recently. It has been stated by the United that it will agree to the rerouting only if the motorists and others involved in the survey agree to the proposed changes recommended for vehicular traffic.

Postponement of Increased Tariff Ordered.—An order suspending until May 20 the proposed new tariff of the Utah Light & Traction Company, Salt Lake City, providing for an increase in fares, has been issued by the Public Utilities Commission of Utah. If the commission passes upon the application of the company for increased rates before that date, the order will be rescinded and a new one issued in accordance with the determination of the commission. In the meantime, however, fares will remain unchanged.

Three Centennial Transit Bills Up.—Three ordinances affecting transportation service at the Sesqui-Centennial Exposition grounds, Philadelphia, Pa., call for trolley and bus terminals of the Philadelphia Rapid Transit Company and for extension of trackage from present limits of the lines into the grounds. The Mayor is authorized by the ordinances to enter into agreements with the Philadelphia Rapid Rapid Transit Company and the Philadelphia Rural Transit Company, a subsidiary, for the maintenance of the tracks and terminals, which will remain in force until July 1, 1957, the life of the city-company partnership agreement. The work is under way. In addition to the terminals, a second ordinance will arrange for track extensions into the grounds. The third ordinance provides for the removal of tracks in Broad Street between Bigler Street and Terminal Avenue, which will be restored after the celebration closes.

Price of Trip Books Reduced.—The Washington, Baltimore & Annapolis Electric Railroad has been granted authority by the Maryland Public Service Commission to put in effect on June 1 a reduced rate. The five-trip books between Baltimore and the District of Columbia line will be reduced from $11.40 to $10 and the ten-trip books from $22.80 to $19.50.

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Recent Bus Developments

Interesting Tour for Sesqui-Centennial Sightseer

To meet the needs of the Sesqui-Centennial sightseer, interested in historical and industrial Philadelphia, Pa., the Philadelphia Rapid Transit Company started three bus tours on May 3. Two of the tours cover greater Philadelphia. The third makes daily trips to Valley Forge. Officials of the company have been working for several months on these tours, and after much research have planned routes which cover the most important historical points in the city.

Tour No. 1, which leaves the P.R.T. waiting room, 237 S. Broad Street, four times daily, includes a trip through historic, business and residential Philadelphia. The cost is $1. The tour consumes 1¾ hours. Tour No. 2 includes greater Philadelphia and Germantown. It consumes 3¾ hours. The cost is $2.50. Two trips are made daily for the Valley Forge tour.

The Mitten Management gas-electric bus, parlor car type, is used on all tours. Trained sightseeing men will accompany these trips. In connection with the tours, the company has issued an interesting folder giving a glimpse of historic Philadelphia and environs.

Buses on Trial in Manitowoc

The proposed plan of the Wisconsin Public Service Corporation to discontinue temporarily its railway service in Manitowoc in favor of city-wide bus service for a trial period of four months was practically accepted by the Common Council when it ordered the street committee of the Council to draw up and submit an ordinance providing for the plan. If the buses do not live up to the claim of the company that they will provide better service the city, in its agreement with the company, is allowed the right to order the return of the street cars. The company also plans to establish a new cross-town bus line on the south side now unserved. A fare of 10 cents will be charged or six tickets for 50 cents. The railway system has been a losing proposition. It is claimed that a fare of 13 cents instead of the present 6 cents would have to be charged if the company were to receive a fair return on its investment. A month's extension from the original proposal for a three months trial was arranged to permit the company to purchase new bus equipment.

Bus Substitution on Outer End of Bergen Line

The Board of Public Utility Commissioners of New Jersey has authorized the Public Service Railway, Newark, N. J., to suspend railway service on the Bergen trolley route between Hackensack and Fairview. The track on which service is to be suspended is the outer end of a long route beginning at the Fourteenth Street terminal in Hoboken. Although known under one name, this was in reality two lines, as there has never been any physical connection across the tracks of the Erie Railroad at Little Ferry. Operation on the outer section has been hampered by congestion in the narrow streets of Hackensack and it is thought that bus operation in this area will be more satisfactory.

The application was made simultaneously with one for approval of local permits to operate twelve buses between and including Hackensack and the Weehawken Ferry, Weehawken, a distance of 11 miles, and on a route which paralleled the railway tracks. This petition was also acted upon favorably by the board, which ruled that both the abandonment of railway service and the installation of the bus served public convenience and necessity. Railway service between Fairview and Hoboken will be continued.

Sightseeing Service in Ottawa

The Ottawa Electric Railway, Ottawa, Ont., plans to operate a sightseeing service with modern bus equipment. The first coach is now nearing completion in the plant of the Ottawa Car Manufacturing Company. This will be the first venture of its kind in Ottawa.

The route which the coach will cover two and three times a day will take in 19 miles of the most beautiful parts of Ottawa and the manufacturing districts of Ottawa and Hull. The new coach is the latest word in that type of vehicle. It will be mounted on a special motor coach body and painted outside in the regular O. E. R. colors. The first coach is to be named "Miss Ottawa."

Major F. D. Burpee, vice-president and manager of the company, states that this department will be expanded just as soon as there is sufficient traffic to warrant it. In addition to the coach for sightseeing purposes, the company is rushing to completion several other buses for its Eastview and Hunt Club services.

Steam Rail May Not Compete with Electric Railway

Massachusetts Department of Public Utilities So Rules—Dissenting Opinion Scores the New Haven Railroad on the Basis of Former Record

IMPORTANT expressions on the issue of railroads engaging in the bus business to the extent of paralleling instead of feeding their rail lines and the wisdom of opening the way for a new competition with the established service of the Boston Elevated Railway are formulated by the Massachusetts Department of Public Utilities.

The case involves the petition of the New York, New Haven & Hartford Railroad, through its subsidiary, for authority to operate a bus line between Boston and Providence.

By a majority vote the department has issued an order permitting the railroad to own and operate the bus line, without the right to do any local business in the territory that is served by the Boston Elevated.

Chairman Henry C. Attwill of the Department of Public Utilities dissents from the decision of his associates in this case. In doing so he stated his views on the law and economics in the situation. He said that he had grave doubts about the propriety of the railroad engaging in the transportation business through such a subsidiary, but that he did not base his dissent upon that at this time. While the certificate issued is a temporary certificate, Mr. Attwill assumed that it was the intention of his associates to make the grant permanent. Unusual zeal was exhibited by the representatives of the railroad, certain residents of North Attleboro, Plainville and Wrentham and the Retail Trade Board of the Boston Chamber of Commerce in their advocacy of the application. On this account Mr. Attwill felt it desirable to state the reasons which led him to dissent from the action of his associates.

It was his view that the Legislature, by providing that it should be unlawful to operate motor vehicles for the carriage of passengers in the manner of a street railway unless a certificate of public convenience and necessity was granted by the Department of Utilities, intended to eliminate unnecessary competition with the existing means of transportation and hoped thus to coordinate the various means of transportation, to the end that unwise duplication, with its consequent waste, might be avoided, so far as was practicable. He said:

> When we grant a certificate merely because there are those who prefer to ride in buses rather than on rails, or because there are those who object to changing from a motor vehicle to a vehicle operated on rails, in the course of their journey, or, forsooth, because a railroad desires to drive out a competitor, we are not, in my judgment, performing our duty as the law contemplates.
>
> I believe that the transportation of passengers in the streets in the areas served by the Boston Elevated Railway system should be done, so far as is practicable, by the Boston Elevated Railway. If we are to permit buses to be operated in the area of the railway system upon the argument that they are not in competition with the Elevated system because the passengers are carried to and from points not in the Elevated area, by the same reasoning we ought to grant any application that may be made by the Eastern Massachusetts Street Railway, the Middlesex & Boston Street Railway or any other transportation company which operates in the vicinity of Boston and which may desire to transport passengers into Boston. If we do not guard zealously the interests of the Boston Elevated Railway system, when is the deficit from operation now assessed against the communities to be repaid, or how are we to have improvements in the system? I appreciate the argument that this line will not take a passenger that now uses the Boston Elevated Railway system or the Eastern Massachusetts Street Railway, but how long will the people of Dedham, Norwood and Westwood be content to see the people of

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Walpole and beyond enjoying transportation to and from Boston by means of their highways while such transportation is denied to them?

It was his judgment the granting of this certificate would inevitably be followed by a demand that motor vehicles passing through Westwood, Dedham and Norwood furnish the people of those communities facilities to and from Boston, or that the Eastern Massachusetts Street Railway furnish like facilities. He said that if this demand be met, it means the taking away from the Elevated system passengers who ride on the Eastern Massachusetts Street Railway and transfer to the Elevated system. On this point he said:

If others, who have an equally meritorius case, are authorized to operate their motor vehicles into the center of Boston, it means a very serious diminishing of passengers carried on the Boston Elevated Railway system. In addition to the serious menace to the Elevated system, in my opinion the granting of this petition means the beginning of a conflict between the railroads and the street railways for passenger traffic on the highways. Nor do I believe it in the interest of the public or the railroad that the application should be granted.

He was unable to visualize how a railroad can carry passengers by motor vehicles any cheaper than others.

At the hearing it was contended by the petitioners that to operate trains so as properly to care for the passengers going by motor vehicles to Dedham would increase the cost of train operation between Dedham and Boston by $75,000 a year. Mr. Attwill assumed by this that it is contemplated by the railroad to operate buses between Dedham and Boston more frequently than trains are now operated. He doubted the wisdom of adding to the already congested condition of the Boston highways when adequate means were at hand to avoid it.

Finally, he was not convinced that under the statutes authorizing railroads to operate motor vehicles the commission was warranted in granting this application. Chapter 135 of the acts of 1925 provides for the insertion in chapter 180 of the General Laws of a section, to be numbered 70A, under the heading "Auxiliary Services." It is by this section that the railroad obtains its authority to operate motor vehicles. He said:

I do not believe it was the intention of the Legislature that railroads should engage in what is to all intents and purposes a street railway business. The proposed bus line is not to be operated as an auxiliary to the train service. It is not proposed to operate the motor vehicles to connect with existing train service along the route. In fact, the contrary appears to be the purpose. It is proposed to operate the line in the manner of a street railway in competition with its own rails. The results of the street railway operations by this railroad in the past have not been such as to inspire confidence in its proposed activity in street transportation. In my judgment, the main purpose of this operation is to drive out by competition the interstate bus lines now operating between Providence and Boston. This, in my opinion, is not a sufficient warrant for the granting of a certificate. I think that the railroad can better improve its financial condition by devoting its energies to the improvement of its rail service than by operating agencies which are bound to impair that service.

I do not wish to be understood as saying that a railroad should not operate motor vehicles on the highways in substitution of trains where the patronage is such as not to warrant the operation of the train. When this is done, however, I believe that through rates and service in connection with the system of the railroad should apply substantially as if the service were entirely by rail.

Dissenting Commissioner Scores New Haven Railroad

THE proposed bus line is not to be operated as an auxiliary to the train service. It is not proposed to operate the motor vehicles to connect with existing train service along the route. In fact, the contrary appears to be the purpose. It is proposed to operate the line in the manner of a street railway in competition with its own rails. The results of the street railway operations by this railroad in the past have not been such as to inspire confidence in its proposed activity in street transportation. In my judgment, the main purpose of this operation is to drive out by competition the interstate bus lines now operating between Providence and Boston. This, in my opinion, is not a sufficient warrant for the granting of a certificate.—*Mr. Attwill.*

Interurban Emphasizes Its Bus Service

Appreciation is fast growing of the extent of the bus operation of the Union Traction Company of Indiana. At the present time the company is operating bus lines out of Indianapolis to Peru by the way of Kokomo and a separate line from Indianapolis to Noblesville, and another line is operated from Indianapolis to Muncie via Anderson, and a line from Anderson to Marion. An Anderson city line is operated from the downtown area to the Remy factory No. 1. Buses and bus lines are Union Traction property and are intended to furnish a co-ordinate passenger service. In this connection the company has recently explained that it is worth while for all employees to recognize this phase of transportation as Union Traction property and to aid and cooperate in bus service as well as car service. Bus service for special parties is available at all times.

Bill to Regulate Interstate Buses Passed by Senate

The Senate has passed the bill to regulate interstate commerce by bus operated for hire through the interstate tunnel now being constructed under the Hudson River between New York City and Jersey City and over the interstate bridge now being constructed across the Delaware River between Philadelphia and Camden, N. J. Senator Reed, the sponsor of the bill, said that the bridge would be opened on July 1 and that if some measure of the kind were not passed the value of these highways to the public might be destroyed by the congestion of traffic that would result. He argued that no other state was interested and that all the parties were agreed on the bill. The measure simply vested in the Public Service Commission and the Bridge and Tunnel Commission the right to control the number of buses to be permitted to use the tunnel and the bridge. The highway facilities afforded by the tunnel and the bridge have been provided entirely by money raised by the states. According to Mr. Reed the measure advocated by him simply proposed that Congress delegate to a local commission the power to regulate, subject to Interstate Commerce Commission review, the flow of interstate commerce across these two rivers. Reservations made in the bill distinctly provided that any order made by the I. C. C. should supersede all rulings by the local authorities.

Establishes More Lines in Fond du Lac.—The Wisconsin Power & Light Company started the operation of two more cross-town bus lines on May 10, to supply twenty-minute service with transfer privileges to residents in the southeast and northeast parts of Fond du Lac. This territory is not served by the railway. Not so long ago a cross-town bus line was established between the eastern and western parts of Fond du Lac.

Ten Cents Cash Authorized.—An increase in fare on all bus lines operated by the Santa Barbara & Suburban Railway, Santa Barbara, Cal., was authorized recently by the City Council. The cash fare is now 10 cents against the old fare of 8 cents. No change was made in the 7-cent, five for 35 cents token rate, or the weekly pass for $1. The application was made to the City Council, which alone has the power of granting such permits wholly within the municipality.

Pays for Bus Deficit.—The County Commissioners of Multnomah County, Oregon, have paid $450 to the Portland Electric Power Company to cover the deficit in operation to that company in running buses to Marquam Hill during the first quarter of 1926. Service by bus was stipulated in the government's decision to locate the $1,250,000 veterans' hospital on that site in Portland.

Will Supplement Rail Service.—Application for permission to operate a bus line from Logan, Utah, to Preston, Idaho, has been filed with the Public Utilities Commission of Utah by the Utah-Idaho Central Railroad. The application sets forth the fact that the public may be more adequately served if buses supplement railway service.

Service with Double-Deck Buses in Boston. — Double-deck buses invaded Boston, Mass., on May 8. Leaving the entrance to the Fenway at Charlesgate East at 8 a.m. the first trip was made down Boylston Street to Charles and thence to Bowdoin Square and return. The round trip consumes 40 minutes. Newspaper men, photographers, officials of the Elevated, and Joseph Phillips, representing the makers of the new bus, made the official first trip. The new bus is an experiment. The degree of its success will regulate any action taken to increase this service.

New Route Planned.—The Gardner & Templeton Street Railway, Gardner, Mass., has been granted a license to operate buses from Gardner to the Athol Fair Grounds, which is the terminal of the Athol & Orange Street Railway. The running time between the two points is 1½ hours. This new route was planned with a view to stimulating patronage on the Athol & Orange Street Railway. The bus route will bring people east of Athol to that center for pleasure and to trade.

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Financial and Corporate

Governing Body at Chicago to Act as Protective Committee

The governing committee of the Chicago City & Connecting Railways Collateral Trust has announced that it had unanimously recommended the action taken by the owners and holders of the sinking fund 5 per cent gold bonds and participating certificates of that company through protective committees.

Pursuant to this recommendation the governing committee, consisting of Bernard E. Sunny, chairman; Roger A. Baldwin, secretary; Henry H. Porter, Rufus C. Dawes, Samuel M. Felton and Charles Day, which owns or represents owners of substantial amounts of these collateral trust bonds, has consented to act as a protective committee with respect to the bonds for the purposes set forth in a deposit agreement dated Feb. 1, 1926.

The action was taken to enable the committee to deal with the important questions presented by the maturity on Jan. 1, 1927, of $20,616,000 of the 5 per cent bonds; by the maturity on Feb. 1, 1927, of nearly $40,000,000 par value outstanding underlying first mortgage bonds of the Chicago City Railway and the Calumet & South Chicago Railway, and by the expiration by limitation on Jan. 21, 1927, of the street railway franchises that are now in force.

The deposit agreement among other things provides that in event of there being formulated a plan for a comprehensive unified system of transportation for the city of Chicago or any similar plan which is acceptable to the committee, copies of the plan will be filed with the depositaries and notice given to the depositors, who shall have the right to file dissents from such plan or to withdraw from the agreement, which they will be at liberty to do upon the terms that are stated in the agreement.

Revenues on Salt Lake City Property Increase

Operating revenues of the Salt Lake & Utah Railroad, Salt Lake City, Utah, which went into the hands of a receiver on July 25, 1925, were $734,035 for the year 1925, an increase of $27,392 over the previous years. The operating expenses, according to a report filed with the Public Utilities Commission of Utah, were $579,931, an increase of $73,840. The ratio of operating expenses to operating revenues was 79.01 per cent. The taxes paid were $62,330, of which $20.65 was to the federal government.

The total amount that was invested in road and equipment on Dec. 31, 1925, was $7,978,866, an increase of $37,471 over the previous year. The debit balance transferred to profit and loss was $60,426, a decrease of $108,452 over the previous year. The length of road owned is 75.14 miles and the average investment per mile is $104,146, while the length of track owned is 97.40 miles, with an average investment of $80,344 per mile of track. The total par value of capital stock outstanding on Dec. 31, 1925, was $5,043,700.

W. C. Orem, president of the Salt Lake & Utah Railroad, in commenting on its present condition and prospects for increased business, stated that during the months of March and April of the present year the passenger business of the road had increased considerably over the corresponding period for each of the past five years, and that it has far surpassed the business of the similar two months last year. He further stated that the road is getting back to a healthy condition, with freight business on the increase.

Proxies Asked for New York & Harlem Meeting

A committee composed of Ernest Sturm, William D. Scholle and Edwin Thorn, representing stockholders, has sent out letters to stockholders of the New York & Harlem Railroad, New York, N. Y., asking for proxies for the annual meeting on May 18. The letter says that sale of the railway line was approved at the stockholders' meeting on April 23, the New York Central's votes assuring that result. Disposition of the avails of such sale was not determined at that meeting. The committee was represented at the meeting and expressed the view that this money should be paid to the Harlem stockholders. The letter adds:

> The use to which these avails shall be put, the real estate situation, the relationship under the lease and other allied matters make it desirable that the minority "Harlem" stockholders should remain firmly banded together, as we always have been since the formation of your committee, to the end that the interests of the minority stockholders should be protected.

Kansas City Affairs Reviewed

Gross Income in 1925 Before Interest Charges Was $1.262,634—Reorganization Committee Brings Out Many Interesting Facts—Reference Made to Bus Operations

AFFAIRS of the Kansas City Railways, Kansas City, Mo., in the past twelve months in connection with the reorganization are revived in a circular issued by the reorganization committee, M. A. Traylor, chairman. In 1925 gross income before interest charges was $1,262,634, while in 1924 it was $1,256,430. The statement of earnings for the years 1925 and 1924 follows:

STATEMENT OF EARNINGS OF THE KANSAS CITY RAILWAYS

	1925	1924
Total railway operating revenue	$9,777,958	$10,024,230
Total motor coach operating revenue	189,621	.....
Miscellaneous rents, etc.—non-operating.	26,902	17,937
Interest on securities owned	223,394	181,450
Total revenue from all sources	$10,217,875	$10,223,617
Total operating expenses and taxes	8,955,241	8,967,187
Gross income before interest charges	$ 1,262,634	$1,256,430

The operating expenses shown above include annual charges of $1,200,000 on account of personal injury and property damage claims and $120,000 on account of receivers' and legal expenses. These two items, aggregating $1,320,000 a year, represent an appropriation of $110,000 each month from Nov. 1, 1921, to date and charged to operating expenses. Adjusting these and other similar items to the actual expenditures, the gross income for 1925 was $1,975,244 and for 1924 $1,911,926. If from these latter figures are deducted the revenue received from interest on securities owned, which do not represent normal earnings from the property, the final adjusted gross income for 1925 was $1,751,850 and for 1924 $1,730,476.

In the first three months of 1926 the total revenue from all sources as compared with the first quarter of 1925 showed an increase of $58,941 and gross income before interest charges a decrease of $130,907. This decrease is due in large part to unprofitable bus operation during the winter months, with traffic light and expenses of bus operation at maximum.

The rates of fare over the street car lines have continued at 8 cents cash, two tokens for 15 cents, five tickets for 35 cents, averaging approximately 7⅛ cents per revenue passenger. The fare on the express bus line is 25 cents and on other bus lines 10 cents with certain transfer privileges.

The federal court having jurisdiction in the railways receivership proceedings rendered a decision, on Dec. 30, 1924, upholding the validity of the first mortgage and of the first mortgage securities against the attacks of the second mortgage bondholders, other contesting creditors and preferred stockholders, and directing a foreclosure of the first mortgage.

Under date of May 15, 1925, a final decree was entered foreclosing the first mortgage and directing a sale of the property and franchises of the company in satisfaction of the debt.

The preferred stockholders' committee and a large creditor of the company

EARNINGS ON NEW SECURITIES OF THE KANSAS CITY RAILWAYS

Adjusted gross income as above for the year 1925	$1,751,850
Interest requirements under the plan of reorganization—6 per cent on $12,465,200 new first mortgage bonds	747,912
Amount applicable to new preferred stock	$1,003,938
Annual dividends on 83,364 shares of preferred at $7 a share	583,548
Balance after preferred dividends	$420,390

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have appealed from this final decree to the Circuit Court of Appeals for the Eighth Circuit, where appeals are still pending.

Promptly after entry of the final decree the reorganization committee promulgated and adopted a plan for the reorganization of the railway, which was unanimously approved by the first mortgage bondholders' and collateral noteholders' protective committees. The plan was thereupon issued under date of June 1, 1925, and copies sent to all depositors with the protective committees and to all known holders of non-deposited first mortgage securities. This plan was accepted and approved by depositors with the protective committees without a single exception and a large number of non-depositors also joined and deposited their securities. In consequence, there is now on deposit with the reorganization committee approximately 96.6 per cent of the outstanding first mortgage securities, aggregating approximately $24,200,000 principal amount out of approximately $25,000,000 principal amount of such securities outstanding.

The plan has been submitted to the Public Service Commission of Missouri as required by law, and under date of Dec. 12, 1925, the commission authorized the issuance of the new securities provided therein upon the new company being vested with the property. This plan was thereupon declared operative by the committee on Dec. 18, 1925.

The reorganization committee has received during the past several months a partial payment on account of the first mortgage securities under order of the federal court in the amount of approximately $1,500,000 and has applied a large part of this fund to the purchase of the judgments for personal injury and property damages and to settlement of the claim of the Kansas City Terminal Railway in accordance with the terms and provisions of the plan.

In accordance with the terms of the final decree and by order of the federal court the properties and franchises of the railway in Missouri and Kansas were offered for sale at auction by the court's commissioner on Jan. 4, 1926, and were bid in by a representative of the reorganization committee for the sum of $8,000,000, the sale being subject to confirmation by the court.

The second mortgage bondholders' committee and preferred stockholders' committee filed objections to the sale and opposed confirmation. Hearings on these objections have been held before the court within the past few days and the case taken under advisement. The reorganization committee understands that, in case the sale be confirmed, the contestants will probably appeal to the upper court. In consequence of these pending legal proceedings and other matters involved in the reorganization, the committee is unable to predict when the receivership will terminate, when the properties will be turned over to the new company and when the new securities will be issued. The committee will, however, endeavor to effect the reorganization with all reasonable promptness.

The receivers of the railway have installed a comprehensive system of motor coach lines to supplement the railway system. These lines consist of through trunk lines, feeder lines and express service to the outlying sections of the city. About 65 buses are now in operation. These lines are operated under a three-year franchise granted by the city. Service over all franchise routes was installed in November, 1925. The reorganization committee advocated the installation of these bus lines as a means of affording additional transportation facilities with a unified system.

Revenue on Connecticut Company's Lines Higher

In the fifty-fourth annual report of the New York, New Haven & Hartford Railroad to the stockholders E. J. Pearson, president, states that the favorable result of the year for the New Haven, and for the railroads of the country as a whole, has been largely due, although generally not so recognized, to more than normal traffic, reduced cost of fuel and some supplies and the absence of any unusual difficulties affecting transportation or industry.

During the year rail service was discontinued on 38.5 miles of road of the Connecticut Company, including 15.9 miles of electrified steam road between Tafts and Central Village, and bus service substituted. These lines, excepting the electrified steam road, were faced with the necessity for extensive track rehabilitation due to pavement construction, and, by reason of their low earning capacity, these expenditures were not warranted. There were also added 64.55 miles of bus routes serving new territory. The combined bus and rail operation shows a slight increase in revenue over the previous year.

On the New York, Westchester & Boston Railway 10,154,199 passengers were carried during the year, an increase of 1,056,489. Of this increase about 200,000 were handled through the Harlem River Terminal, taking advantage of the improved facilities mentioned in the 1924 report. The extension of the road from Larchmont to Mamaroneck was opened for business on March 21, 1926.

The accompanying table shows the income account of the electric railway properties of the New York, New Haven & Hartford Railroad during 1925 compared with the previous year.

Receiver's Rights in Rockford Questioned

The battle over the disposition of the properties of the Rockford City Traction Company, Rockford, Ill., and affiliated interurban lines began recently in the Circuit Court with prospect of developing into a lengthy legal clash over settlement. Adam Gschwindt, receiver, was denied the right to petition the court to sell real estate of the road or to abandon the Freeport, Beloit & Janesville lines. The final order was not entered by Judge E. D. Shurtleff, who will return later to hear further arguments in the case. The court held that the receiver's petitions could not be considered because, as a non-partisan officer of the law, it is not within his province to become a party to litigation of property in his custody.

The receiver had petitioned the court that first mortgage bondholders of the Rockford & Interurban line, second mortgage bondholders of the Beloit and Janesville lines and second mortgage bondholders of the Freeport lines should have the physical property of the lines returned to them. Mr. Gschwindt suggested that these bondholders either guarantee the deficit on each line or have their own respective receivers appointed. The second petition sought authority to sell real estate owned by the traction system but not required in operation of the lines. It is believed that petitions representing both these

	Connecticut Company		Berkshire Street Railway		New York, Westchester & Boston Railway		New York & Stamford Railway		Westchester Street Railroad ¶	
	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*	Year 1925	Comparison with 1924 Increase or *Decrease*
Total operating revenues	$14,522,176	$147,338	$858,875	*$69,703*	$1,648,900	$127,454	$517,949	$4,142	$221,911	$5,262
Total operating expenses	11,585,187	*5,548*	749,647	*24,422*	1,060,438	67,242	385,258	*8,893*	192,277	*17,478*
Net operating revenue	$2,936,989	$152,886	$109,228	*$45,280*	$588,462	$60,212	132,691	$13,035	$29,633	$22,740
Tax accruals	630,327	41,871	20,144	*18,994*	216,287	6,271	23,346	*1,349*	11,301	*1,358*
Operating income	$2,306,661	$111,015	$89,083	*$26,286*	$372,174	$53,941	$109,344	$14,385	$18,332	$24,099
Non-operating income	50,758	324	6,161	4,384	6,971	*3,655*	855	*2,950*	630	*545*
Gross income	$2,357,420	$111,340	$95,245	*$21,902*	$379,146	$50,285	$110,200	$11,434	$18,962	$23,553
Deductions from gross income	1,491,946	*51,665*	*302,710	7,728	‡2,051,947	88,157	§*113,567	1,512	‖31,704	*1,732*
Net income	$865,474	$163,005	†*$207,465*	*$29,630*	†*$1,672,800*	*$37,871*	†*$3,367*	$9,922	†*$12,741*	$25,286

* Deductions from gross income include $209,980 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

† *Deficit.*

‡ Deductions from gross income include $1,100,008 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

§ Deductions from gross income include $40,225 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

¶ This company is entirely separate from the New York, Westchester and Boston Railway. Road in hands of receiver from Feb. 29, 1920—receiver's account included.

‖ Deductions from gross income include $26,858 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

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actions will be renewed in the name of the committee of bondholders. Eleven pieces of property owned by the Rockford City Traction Company and estimated to be worth $300,000 have been offered for sale.

Trading Starts in New St. Louis Securities

Trading in the securities of the St. Louis Public Service Company, the proposed successor to the United Railways, was started on the St. Louis Stock Exchange on May 3. Initial sales of the common were at $17.50 to $17.75.

On May 1 the interests which will control the new company made an initial payment of about $1,450,000 on the 343,645 shares of new common.

Holders of the 163,830 shares of United Railways preferred had the privilege of buying three shares of the new common at $12.50 for each two shares of preferred held. Holders of the $9,790,000 Transit Company bonds had the right to buy ten new shares at $12.50 for each $1,000 bond held.

Such common stock in the new company not purchased by the United Railway preferred stockholders and Transit bond owners under their option privileges will be offered to the holders of the 249,139 shares of United Railways common stock, 72 per cent of which is owned by North American Company.

The payments made on May 1 were on the basis of $4.50 a share. Another payment of $4 will be due on July 1 and a third payment of $4 at some date not yet set. The total revenue from the sale of the new common stock will be $4,295,562.

The refinancing of the railway properties is based on the expectation that the company will be granted a service-at-cost franchise from the city that will permit it to earn 7 per cent return on a valuation of $57,000,000.

The initial trading in the new stock was slightly above the price that prevailed on the United Railways preferred stock, which carried the privilege of purchase of the new stock. The preferred had been selling for $7. Holders had the privilege of buying the new stock on the basis of $12.50 a share. On this basis the new stock had a tentative stock market value of $17.17.

6 per Cent Preferred Issue for Illinois Power & Light

A special meeting of stockholders of the Illinois Power & Light Corporation, Chicago, Ill., has been called for July 14 for the purpose of approving a change in the dividend rate upon the unissued 70,000 shares of the preferred stock of the corporation from 7 per cent to 6 per cent per annum.

The new issue will have the same rights, privileges, preferences and restrictions as the present 7 per cent issue. The only difference between the two issues will be in the dividend rate.

The officers and directors believe that in the interests of the present holders of preferred stock of the corporation and of the corporation itself, advantage should be taken of the improved conditions which make it possible to dispose of a 6 per cent preferred stock on a satisfactory basis.

Earnings in Akron Higher in 1925

Earnings from transportation on the lines of the Northern Ohio Power & Light Company, Akron, Ohio, for the year ended Dec. 31, 1925, increased to $6,177,542; for the year previous these earnings were $5,364,189. A study of the sources of gross earnings during the past several years shows that the earnings in this department, with a few years excepted, have increased gradually. An increase of 2,468,025 revenue passengers was shown for the year 1925; 160,823 tons of freight were handled and the gross revenue for this kind of business increased from $498,970 in 1924 to $647,712 in 1925. These facts were contained in the report to the stockholders for the year ended Dec. 31, 1925.

The company continued its policy of expending large sums of money on additions and betterments with $1,645,919 for use in the transportation department. The most important expenditures included the purchase of 33 single-deck buses of improved type for operation in city and interurban service, the purchase from competitors and other bus operating companies of 38 buses of various types, construction in the interurban division of 18,100 ft. of single track, double tracking interurban line between Canton and Massillon, rebuilding and equipping 103 electric passenger cars for one-man operation and the purchase of six new freight trail cars, together with the rebuilding of four passenger cars into freight motor cars.

There were many new developments in the transportation department. A franchise covering operations in the city of Akron was approved in November, 1924.

The report refers to the expansion of the customer-ownership idea and to the consistent growth of this partnership between the people of northern Ohio and the Northern Ohio Power & Light. During 1925 the company began the group life insurance plan, providing for its employees, in service a year or more, a life insurance free of cost. The pension fund at the end of the year totaled $52,929 in cash and investments, an increase of $2,297 over 1924. The company continued its systematic safety and accident prevention program in all of its departments with gratifying results. Notwithstanding a considerable increase in car and bus miles operated in 1925 over 1924, and notwithstanding an increase in registration of automobiles of approximately 30 per cent, the records show that not a single passenger or trainman was killed on the entire system during the past three years.

On Feb. 9, 1926, a resolution was passed by the directors to amend the articles of incorporation so as to change the company's corporate name to Northern Ohio Power & Light Company. This amendment was submitted to the stockholders and approved by them at a special meeting held on March 15, 1926. The report says the directors deemed it advisable to make this change in name in view of the fact that the electric light and power business had become such an increasingly important factor in the affairs of the company.

The accompanying statements show the income and expenses for 1925 as well as the traffic carried for 1925 and four previous years on the city system and interurban systems.

COMPARATIVE STATEMENT OF EARNINGS OF THE NORTHERN OHIO POWER & LIGHT COMPANY

	1925	1924
Gross Earnings:		
Electric	$5,322,156	$4,716,808
Transportation	6,177,541	5,364,189
Total	$11,499,698	$10,080,997
Operating expenses and taxes:		
Operating expenses	$7,618,402	$7,161,533
Taxes	822,000	741,900
Total	$8,440,402	$7,903,433
Gross income	$3,059,296	$2,177,563
Interest and other fixed charges	1,557,841	1,441,966
Net income available for dividends and retirement reserve	$1,501,454	$735,596
Dividends on preferred stock	437,334	431,750
Balance	$1,064,119	$303,846
Ratio of operating expenses to gross earnings, per cent	66.25	71.04
Ratio of operating expenses and taxes to gross earnings, per cent	73.40	78.40

STATEMENT OF PASSENGERS CARRIED BY NORTHERN OHIO POWER & LIGHT COMPANY

Calendar Year	Revenue Passengers Carried—Rail and Buses: City Systems	Interurban Systems
1921	47,799,437	16,820,442
1922	50,632,248	17,117,064
1923	54,112,423	16,784,535
1924	48,563,053	14,478,984
1925	51,352,849	14,266,754

Small Increase in Passengers in Baltimore

A comparison of street car passengers carried by the United Railways & Electric Company, Baltimore, Md., for the first quarter of this year, as against the corresponding period of 1925, is noted below:

	1926	1925	Per Cent Increase or Decrease
January	18,952,322	18,764,851	+ .99
February	17,458,793	17,620,805	— .92
March	19,760,440	19,213,695	+ 2.85
	56,171,555	55,599,351	+ 1.03

$1,700,000 of Equipment Trusts Offered

Mercantile Securities Company, San Francisco, Cal., is offering for subscription $1,700,000 of 5½ per cent equipment trust gold certificates of the Key System Transit Company, Oakland, Cal., issued under the Philadelphia plan. The certificates are dated April 1, 1926, and mature serially, the final maturity being April 1, 1938. Prices vary from 100.48 for the earliest maturity, namely, April 1, 1927, to 97.01 for the last maturity, and the yields vary from 5 per cent to 5.85 per cent. The certificates are issued in part payment for 29 double-truck motor passenger cars and two double-end steel turbo-electric ferryboats.

All of the equipment will be new and will cost not less than $2,153,561, of which an initial payment of $453,416, representing more than 20 per cent of

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the cost of the equipment, will be paid by the railway. Under the terms of the lease the company will pay a rental sufficient to cover dividend warrants, annual maturities and all other charges as they fall due. The Key System Transit Company provides transportation service for Oakland, Berkeley, Alameda and other cities on the eastern shore of San Francisco Bay.

Illinois Interurban Ordered Sold

Assets of the Alton, Granite & St. Louis Traction Company and the Alton Gas & Electric Company have been ordered sold by Judge Lindley of Danville, Ill., sitting in the United States District Court at East St. Louis, Ill., following a hearing on a bill to foreclose a mortgage on the properties. The mortgage was security for a bond issue of $2,496,000 floated in 1904.

Both companies have been in receivership, the traction system since 1920 and the gas and electric properties since last December. Thomas W. Gregory, vice-president of the East St. Louis & Suburban Railway, is receiver for both companies. The traction company operates an interurban line from Alton, Ill., to St. Louis, Mo. At the hearing before Judge Lindley, Mr. Gregory stated that no interest had been paid on the traction company's bond issue of $2,496,000 since the receivership proceedings were instituted. He expressed the belief that the plants and lines of the companies could be grouped and sold as units. The indebtedness of the two companies is about $4,000,000.

Peter P. Schafer, Champaign, Ill., has been appointed special master to conduct the sale.

Dayton Company Moves Offices.—The Cincinnati, Hamilton & Dayton Railway, which has purchased the railway property of the Cincinnati & Dayton Traction Company, has announced the removal of its general offices to 928 Third National Building, Dayton, Ohio. J. H. McClure is vice-president and general manager of the new property.

Wants Less Equipment in Service.—The Cairo & St. Louis Railroad filed an application with the City Council of Cairo, Ill., recently seeking permission to discontinue operation of four of its street cars in Cairo. Three of the cars, which it is proposed to discontinue, operate on regular schedule in the business district, while the other is an "owl" car. The company contends that its revenues continue to decline.

Would Substitute Buses.—The Central Illinois Traction Company has filed a petition with the City Council of Paris, Ill., seeking to discontinue railway service there. At one time the lines were a paying proposition, but the automobile has ruined the business, according to the statement. The company asks the right to operate buses over the streets now occupied by its tracks.

$975,438 Allowed in Condemnation Case.—Supreme Court Justice O'Malley at New York has awarded $975,438 to the Interborough Rapid Transit Company and Manhattan Railways in consideration of $4,200,000 in claims for condemnation by the city of the 42d Street elevated spur. The company claimed $3,600,000 for easements of light, air and access surrendered, but received $750,000; its franchise was held at $100,000 and the award was $25,000; its physical value was placed at $185,513 and $120,438 was awarded. The spur that was removed extended west from Third Avenue for a distance of several blocks to the junction of Fourth Avenue with 42d Street at the Grand Central Station.

Railway Effects for Sale. — H. E. Salzberg Company, Inc., which recently purchased all the physical assets of the former New York & Long Island Traction Company, New York, N. Y., has announced that it will offer for sale all the recently acquired equipment. The effects for sale include Birney cars, Brill cars, Southern cars, sweepers, snow plows, work cars, materials and supplies, machine shop equipment, track tools and approximately 40 miles of track and overhead material. The Salzberg Company deals in new and second-hand electrical and steam machinery at 50 Church Street, New York City.

$8,312 Added to Stabilizing Fund.—The Des Moines City Railway, Des Moines, Iowa, added $8,312 to its stabilizing fund in March, according to the monthly report, bringing the fund to $8,381. Total revenue for the month was $213,253 and passengers numbered 2,188,838. The fund has to reach $150,000 before a fare decrease will be possible.

Condensed Data on Barstow Utility Properties.—"Public Utility Properties of General Gas & Electric Corporation" has been issued by W. S. Barstow & Company, Inc., financial and operating managers. This is a book of 146 pages containing information regarding public utility companies with yearly gross earnings of approximately $21,500,000 after intercompany eliminations. A thorough description of each property is given, together with its latest income account and an explanation of its capitalization.

Revenue Exceeds Expenses.—For the month of March, 1926, the revenue of the Boston Elevated Railway, Boston, Mass., exceeded the cost of service by $161,773, against $211,956 in March, 1925. The number of revenue passengers totaled 33,802,662, against 32,338,441. Total miles operated, including bus-miles, amounted to 5,045,642, against 4,798,747 in March, 1925.

$7,000,000 Valuation Item Fought.—Arguments have been completed in the Circuit Court of Baltimore on a petition which seeks to restrain the Maryland Public Service Commission and the United Railways & Electric Company from including a valuation of $7,000,000 on easements of the company in the valuation placed on the property. In a recent hearing covering several months the commission included the $7,000,000 item in the total valuation of $77,000,000. The petition was filed by Clarence W. Miles, formerly people's counsel, before the Public Service Commission. Since the conclusion of the case before the commission he has resigned. Linwood L. Clark, representing the People's Corporation, also appeared in the court case and argued against an item of $8,560,210 allowed for going value. Thomas J. Tingley, newly appointed people's counsel, also appeared in the case. Edwin G. Baetjer, Joseph G. France and Attorney-General Thomas H. Robinson appeared for the defendants.

Georgia Light Rumor Corrected.—Published accounts that Cities Service Company had secured a substantial interest in the stock of the Georgia Light, Railway & Power Company are stated to be erroneous. It is understood, however, that H. L. Doherty & Company has secured a stock interest in the company which is not a controlling interest.

Nebraska Read Would Discontinue 8 Miles.—The Omaha & Lincoln Railway & Light Company, Lincoln, Neb., has asked permission of the State Railway Commission to abandon that part of its interurban lines between Ralston and Papillion, a distance of 3.9 miles, and to substitute bus service. It also desires to withdraw railway service on its 4-mile line between 26th and N Streets, Omaha, and Ralston, with the exception of two cars a day to be operated solely for the purpose of holding the franchise. Partial service on this stretch has been given by buses, and the full schedule will be so maintained hereafter if approval is received. The Ralston-Papillion line traverses a highway that is about to be surfaced. Traffic over the railway is alleged to be insufficient to pay expenses of operating this section.

Messrs. Gannon and Smith on St. Louis Board.—Frank A. Gannon and J. Sheppard Smith were elected directors of the United Railways, St. Louis, at the annual meeting, succeeding Murray Charleton, resigned, and John I. Beggs, deceased. Other directors were re-elected.

May Abandon One Line.—The Jamestown Street Railway is planning the abandonment of the Willard Street line from Winsor Street to the city line in Jamestown, N. Y. According to the company officials, the line, which was opened in 1914, has never produced sufficient revenue to warrant the maintenance of service. Another factor entering into the situation is the large expenditure the company is making for the repair of pavements between the rails on various streets.

Gross Corporate Income Increases.—The San Francisco, Napa & Calistoga Railway, operating in Vallejo, Napa, St. Helena and Calistoga, reports to the California Railroad Commission its 1925 operating revenue at $246,913, compared with $275,280 for 1924. The operating expenses, excluding taxes, for 1925 were $157,322, and $186,069 for 1924, leaving net operating revenue of $89,591 for 1925 and $89,210 for 1924. During 1925 taxes charged to operation were $16,928 and for 1924 $22,838. Deducting the taxes leaves operating income of $72,662 for 1925, and $66,372 for 1924. Adding the non-operating income of the company to the operating income, results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $76,383 for 1925 and $70,508 for 1924.

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Personal Items

Thomas Pumfrey Chief Engineer of Oregon Property

Thomas Pumfrey has been appointed chief engineer of the Portland Electric Power Company, Portland, Ore., in entire charge of maintenance of way and equipment for the city lines, buses and interurban lines. The office of master mechanic, which has been vacant since the recent death of Frank B. Willis, will be abolished.

Mr. Pumfrey has had charge of the maintenance and way departments for sixteen years with supervision over construction and maintenance of tracks, roadways, bridges, buildings and over all engineering and draughting work. In addition to those duties he will now have entire charge of all rolling stock.

Before he went with the Portland Electric Power Company, Mr. Pumfrey served as chief engineer of the International Railway, Buffalo, N. Y., from 1899 to 1910.

Illinois Traction Appointments Announced

Five promotions in the personnel of the Illinois Traction System are announced by L. B. Martin, general superintendent, Springfield, Ill.

J. H. Morris, who has been superintendent of the southern division at Staunton for several years, is promoted to be superintendent of transportation, with headquarters at Springfield, vice A. S. Bergschneider, resigned.

O. C. Genung is advanced to fill Mr. Morris' place as superintendent of the southern division with headquarters at Staunton, Ill.

S. W. Haberle, who has been chief dispatcher at Mackinaw Junction, Ill., is appointed superintendent of the northern division, with headquarters at Mackinaw Junction, to succeed Mr. Genung.

C. F. Warren is to be chief dispatcher at Mackinaw Junction in place of Mr. Haberle.

B. C. Leach is appointed chief dispatcher at Staunton, Ill.

Mr. Morris, the new superintendent of transportation, started with the company many years ago, handling the dispatcher's key at Mackinaw Junction.

F. S. Dewey, vice-president of the Kansas City Power & Light Company, Kansas City, Mo., was elected to serve as president of the Missouri Association of Public Utilities at the annual convention at Springfield, Mo. The convention adjourned on May 6.

Thomas P. Easten was, on April 14, appointed general manager of the Newcastle-on-Tyne Corporation Tramways. Mr. Easten has been with the undertaking since its commencement, and for some time has been assistant general manager. He succeeds Ernest Hatton, the general manager and engineer, who has retired owing to ill health. W. T. Dalton, assistant engineer since the opening of the electric tramways, was appointed engineer at a salary of £800 per annum.

Leslie Spraggon Assistant to President at Buffalo

Leslie Spraggon, superintendent of equipment of the International Railway, Buffalo, N. Y., has been promoted to assistant to the president of the company. Announcement of the appointment was made by B. J. Yungbluth, president of the International, following the resignation of H. L. Mack as vice-president in charge of engineering.

Mr. Spraggon has been with the International system since Dec. 1, 1924. He has been in charge of maintenance of all cars and buses. His early life was spent in Pittsburgh, where he attended the public schools. Mr. Spraggon's first position was as an apprentice in the electrical department of the Carnegie Steel Company of Pittsburgh. He took a night course in electrical engineering in the Westinghouse technical night school and in 1914 went to the Terre Haute, Indianapolis & Eastern Traction Company as assistant master mechanic. There he remained until 1916. Later he was with the Connecticut Company, New Haven, Conn., as assistant supervisor of equpiment.

Leslie Spraggon

He was called back to take charge of that company's equipment after a service of two years with the Boston office of the Westinghouse Electric & Manufacturing Company as sales engineer. From the Connecticut Company Mr. Spraggon went with the International Railway.

During his service as superintendent of equipment of the International Mr. Spraggon was very largely responsible for a 40 per cent reduction in removal of cars from service because of mechanical defects. This improved maintenance, President Yungbluth says, helped the transportation department to achieve a record last year of 90 per cent cars on time at terminal points. He was in charge of the company's safety first work.

Obituary

Benjamin B. Odell, Jr.

Benjamin Barker Odell, Jr., former Governor of New York, and identified with transit developments in Newburgh, N. Y., for many years, died in that city on May 9. Besides his prominent political affiliations, he was at one time president of the Consolidated Gas, Electric Light, Heat & Power Company of Newburgh and of the Central Hudson Steamboat Company.

Mr. Odell at the time of his death was president of the Newburgh Public Service Corporation, formerly the Newburgh City & Suburban Railway. This property has long been owned and controlled by the Odell family.

He and his associates in the management of that company, B. Bryant Odell and H. B. Odell, formerly one of its officers, were among the first to recognize the place of the bus in transportation and to use that vehicle in increasing the effectiveness of the local transportation service to the people of Newburgh and vicinity.

Clarence Thayer Fernald

Clarence Thayer Fernald, chief engineer of the Boston Elevated Railway, Boston, Mass., died on May 11 in Melrose. It is to be said of Mr. Fernald that he was an integral part of the rapid transit system of Boston. He grew up with it, assisted in its construction and since the death of his predecessor, Chief Engineer George A. Kimball, he has directed the completion of the Elevated system up to its present point. He was intimately connected with the building of every branch of it, the elevated structures and the tunnels and subways, and lately the construction of the extension along the Shawmut branch of the New York, New Haven & Hartford Railroad.

Mr. Fernald became associated with the Boston Elevated Railway in 1900. Prior to that time he had been employed by the Norfolk & Western Railway on preliminary and location surveys and in a general engineering practice in Melrose. Mr. Fernald was born in Charleston, Mass., in 1866. He received a common and high school education and some years later took up scientific studies and advanced mathematics at Massachusetts Institute.

Mr. Fernald had interests beyond his profession. He took part in the affairs of his community, was active in its political interests as a Republican and had connection with several fraternal, social and technical associations.

Frank B. Willis, master mechanic of the Portland Electric Power Company, Portland, Ore., died at his home in that city on April 27. Mr. Willis was a member of the Twenty-Year Club of the company. Working at first as machinist, he was made foreman of the shops in 1912, when all the shops were consolidated. In 1922 he was promoted to assistant mechanic, and just one year ago in April he became master mechanic upon the death of Franklin P. Maize. Mr. Willis was 44 years of age.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Richmond Will Have Expenditure of $1,000,000

Passage of the new blanket franchise in Richmond, Va., by the City Council will mark the entrance of the Virginia Electric & Power Company on an extensive program of bus and trolley coordination. Approximately $1,000,000 will be spent immediately in the purchase of new buses and street cars and in making extensions and improvements to service. It is expected that this measure will be passed by the Council members without much opposition and that the work of improving the transportation system may be well under way within the next few weeks.

Disposition of the required bus ordinance is expected to be made while the blanket franchise is being subjected to the legal period of advertisement, a step not necessary with the bus paper. The company expended $400,000 in the purchase of the assets of the Richmond Rapid Transit Corporation last September and since that time has added a number of new buses to the system. As soon as the bus ordinance has been adopted approximately 25 new buses will be added to the fleet, at a cost of between $160,000 and $175,000. These new units will be used on extensions of lines planned by the company.

Delivery is being made of the fifteen street cars ordered by the company from the American Car Company, St. Louis, Mo., in December. Specifications on these units appeared in ELECTRIC RAILWAY JOURNAL on March 20, 1926.

Oil-Electric for Chicago

The first oil-electric locomotive for use in the West recently left for Chicago under its own power, for delivery to the Chicago & Northwestern Railway. The locomotive was built by the General Electric, Ingersoll-Rand and American Locomotive companies. It has a capacity of 300 hp. and a weight of 60 tons; running unattached, its operating cost is said to average 1.2 cents per mile. The unit was to run directly from Schenectady to Chicago on its delivery trip.

Executive Changes in Fort Pitt Steel Casting Company

John W. Guay, formerly sales engineer of the Fort Pitt Steel Casting Company, McKeesport, Pa., is now works manager, and H. F. Stratton, formerly in charge of the pattern, mold and core department, is the new superintendent.

Mr. Guay's appointment marks the culmination of eighteen years' diversified experience with the Fort Pitt Steel Casting Company, both in the sales and operating departments. He was for several years in the mechanical department of the Pennsylvania Railroad, prior to his connection with the Fort Pitt Steel Casting Company in 1908.

Mr. Stratton has been general foreman of the pattern, mold and core department of this company. He is a graduate of the mechanical engineering department of Purdue University, and before joining the Fort Pitt Steel Casting Company, in 1920, was for several years connected with the Isaac G. Johnson Company.

Westinghouse Company Announces Promotions

According to an announcement by E. D. Kilburn, vice-president and general sales manager, J. McA. Duncan, for fourteen years Pittsburgh district manager, has been promoted to assistant general sales manager of the Westinghouse Electric & Manufacturing Company. Mr. Duncan has been in the employ of the company for 40 years and has worked in almost every department. This wide experience, coupled with unusual executive ability, eventually led to his recent appointment. W. R. Marshall, formerly branch manager of Buffalo, has been selected to assume the duties of Pittsburgh district manager. These appointments are effective May 1.

In addition to these appointments, H. F. Boe, formerly industrial division manager at Buffalo, has been promoted to branch manager of that office and R. L. Kimber to industrial division manager. W. F. Barnes is appointed branch manager of the Tulsa office of the Westinghouse company.

Four to One Split in G.E. Stock Approved

Stockholders of the General Electric Company at the annual meeting in Schenectady on May 11 approved the plan to change the present authorized common stock of 1,850,000 shares of the par value of $100 each into 7,400,000 shares of common stock without par value. This was in accord with the recommendation of the board of directors the previous month to split the stock on a 4 to 1 basis. Myron F. Westover, secretary of the company, was elected to the board of directors, filling the vacancy caused by the death of E. R. Stettinius, New York. Other directors were re-elected.

When Different Fares Were Rung on the Same Register

The great advance which has taken place in the last 25 years in methods of fare collection and registration is well illustrated in the little pamphlet recently published by the Ohmer Fare Register Company, Dayton, Ohio. It is a reprint of an address delivered by John F. Ohmer before the Pennsylvania Street Railway Association in 1903, and pointed out the objections to the then common practice of having a variety of fares rung up on a single register. As a substitute for this method, Mr. Ohmer outlined the now familiar capa-

ELECTRIC RAILWAY MATERIAL PRICES—May 11, 1926

Metals—New York

Copper, electrolytic, cents per lb.	13.90
Lead, cents per lb.	7.75
Nickel, cents per lb.	35.00
Zinc, cents per lb.	7.12
Tin, Straits, cents per lb.	64.25
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	56.00
General service	31.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.625
Somerset mine run, Boston	2.00
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	1.925
Central, Ill., screenings, Chicago	1.575
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.30
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in. x 8 in. x 8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.15
Sheet iron, galvanized (28 gage), cents per lb.	4.40
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12–18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–17.50
Colored	10–14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.2
White lead in oil (100 lb. keg), cents per lb.	15.00
Turpentine (bbl. lots), per gal.	$0.92
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.50
Light copper, cents per lb.	9 50
Heavy brass, cents per lb.	7.125
Zinc, old scrap, cents per lb.	4 25
Lead, cents per lb. (heavy)	6.75
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	17.75
Rails (short), Chicago, gross ton	16.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	7.75

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bilities of his recording register and its advantages to conductors, railway and accountants.

In 1903 the ideas outlined in the paper mentioned seemed revolutionary, but the advantages were so evident as to make a strong appeal. Among the companies now using Ohmer fare registers, there are 148 which have employed the register for periods varying from ten to twenty-six years, and most of this number have been users of the register for more than twenty years.

Unfilled Orders for 73 Electric Locomotives

During the month of April twelve electric locomotives were shipped for domestic use and sixteen for foreign use, according to figures compiled by the Department of Commerce. At the end of the month there were unfilled orders for 44 electric locomotives for domestic purchasers and 29 for foreign railways. These figures compare with eleven domestic deliveries and one foreign delivery in March and unfilled orders for 50 domestic and 41 foreign also at the end of March.

Montreal Cars to Have Plymetl Sides and Agasote Headlining

Plymetl, manufactured by the Haskelite Manufacturing Company, will be used for side panels on the 50 new cars being built for the Montreal Tramways, Montreal, Que. The cars are being constructed by the Canadian Car & Foundry Company. Abstracted specifications were published in the issue of this paper for May 8, 1926, page 830, which were in error in giving the material used for headlining. Agasote manufactured by the Pantasote Company, Inc., will be used on these cars.

Tire Man Talks on Balloons for Buses

Balloon tires for buses are coming into popularity fast. This was one of the statements made by William O'Neil, president of the General Tire & Rubber Company, recently, in the course of a summary of the progress of the industry. According to Mr. O'Neil tire engineers have been as active as automobile and bus engineers in bringing every possible comfort and improvement to this fast-growing new mode of transportation.

Interesting as was Mr. O'Neil's summary of the progress of the bus, his remarks about tires deserve particular attention. Among other things he said:

> Pneumatic tires were the first big innovation, but were of doubtful value for a time because the old, cross-woven type of fabric construction was used and fabric tires absolutely refused to stand up. With the appearance of the cord tire the situation improved and cord tires made pneumatics for buses possible. General was among the very first in the field with pneumatic cord tires for the bus, and has followed bus and bus tire development very closely from the beginning.

Mr. O'Neil said that his company's latest contribution to the art is the balloon tire for bus service—strong and sturdy enough to carry the loads and bear the strains, and having large enough air spaces to provide the utmost comfort for passengers and protection for mechanism. Of this particular development he said:

> The greater cushion makes greater speed possible as well and it now seems likely that within a short time most buses will be on balloon tires. Many thousand General balloons are already in bus service and the results are most gratifying to all concerned.

Rolling Stock

Boston Elevated Railway, Boston, Mass., has purchased five 29-passenger city type Mack buses, making 85 units of this type in its large fleet.

Twin City Rapid Transit Company, Minneapolis, Minn., has ordered one Differential electric locomotive crane car from the Differential Steel Car Company of Findlay, Ohio. This car will be equipped with four G.E.-275 motors with type M control, a master controller to be located in the craneman's turret as well as in the front cab of the car.

Track and Line

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., plans to double track a portion of its line in Milwaukee lying north of Harrison Street.

Wisconsin Power & Light Company, Oshkosh, Wis., will rebuild its interurban track in Plymouth. As soon as this work is completed similar track rebuilding improvements will be carried out on West Irving Street in Oshkosh.

Rockford City Traction Company, Rockford, Ill., has received permission to spend $4,000 to $5,000 for new rails. They will be placed on East and West State Streets, South Main and Seventh Streets.

Springfield Street Railway, Springfield, Mass., through General Manager Herbert M. Flanders, has announced the company's immediate program for the construction and improvement of its trolley track. The initial work along this line calls for an expenditure of $25,000 for relaying the double track on State Street between Pine Point and Bay Road. A section of track in Longmeadow is also to be relaid for a distance of ¼ mile.

Trade Notes

H. N. Goodell has been made district manager of the Western district of the Graybar Electric Company. This appointment was made known coincident with the announcement of transfer of headquarters of the Western district from St. Louis to Kansas City.

Ludlum Steel Company, Watervliet, N. Y., is building a continuous furnace of modern construction and design for billet heating. In the recuperative equipment is employed Ludlum's own heat and scale-resisting material.

Ward B. Maurer has been placed in charge of the new branch office opened by American Hoist & Derrick Company, 1943 Railway Exchange Building, St. Louis, Mo. Mr. Maurer has a wide acquaintanceship with railway men and users of hoisting machinery in general. Before joining the sales force of the American Hoist & Derrick Company several years ago, he was a member of the engineering staff of the Baltimore & Ohio Railroad.

R. L. Cluverius has been appointed Southern department manager of the National Railway Appliance Company, with headquarters in the Munsey Building, Washington, D. C., succeeding H. W. Kidwell, resigned.

Graybar Electric Company announces the appointment of W. B. DeForest as sales manager of its New York offices. Mr. DeForest, previous to his new appointment, was Kansas City branch manager. He brings to his new position the benefit of seventeen years' experience with the Western Electric Company.

Western Electric Company has just opened a new distributing branch house at 50-52 Portland Street, Worcester, Mass. W. A. Searle has been appointed sales manager of this branch, operated by the Boston Supply House as a part of the campaign for better service in the New England territory.

Sullivan Machinery Company, Chicago, Ill., announces that its Knoxville, Tenn., office has just moved from the old location at 614 Market Street to new and larger offices at Room 611-15 General Building, 623 Market Street. E. L. Thomas is manager of the Knoxville branch.

New Advertising Literature

Graybar Electric Company, Inc., New York, N. Y., has issued its 1926 fan catalog, with complete information on all models of fans built by the company.

Quigley Furnace Specialties Company, Inc., New York, N. Y., has issued a booklet entitled "The Quigley Refractory Gun." Information is included therein on the use of this equipment in furnace maintenance, meeting the problem of keeping furnaces at full capacity with minimum shutdowns for repairs. Directions are given for the preparation and use of Hytempite, which is recommended for use as a bond for the ganister.

General Electric Company, Schenectady, N. Y., has issued a 33-page illustrated bulletin, No. GEA-232, entitled "Power Factor and Means for Its Improvement." It is a practical treatise on power factor with the mathematics reduced to simple arithmetic.

Billings & Spencer Company, Hartford, Conn., has issued the 36th edition of its annual catalog of drop-forged tools. It has been the endeavor of the manufacturer to make this catalog a handy guide for all men in wrench-using trades. In addition to the regular Billings numbers, the trade numbers of open-end wrenches are given, and convenient reference may be found in the wrench index table giving dimensions of wrench openings to fit standard nut and bolt sizes. Several new products are listed, such as the chrome-molybdenum tappet and check-nut wrenches and a complete line of chrome - molybdenum "Life - time" wrenches.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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CHARLES GORDON, *Editor*

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Leading the Way to Transit Improvement

ONLY within comparatively recent years has the need for city planning taken root and made progress. Until the combination of the modern skyscraper and the automobile brought matters to a climax, American cities, like Topsy, "just grew up." Present-day congestion results from the lack of early planning and inability to foresee the extent of the growth in demand for street space.

Public opinion has failed to keep pace with rapidly changing conditions. The individual property owner has been allowed the utmost freedom in the improvement of his holdings without regard to the cumulative effect on the community as a whole. City plans and zoning laws restrict the rights of the individual within the limits required by the community. But their ultimate effect is to the advantage of the individual.

Since city property value is created by the growth of the community, wise zoning measures designed to bring about orderly development and community stability react to the ultimate advantage of the individual. Nevertheless, zoning laws and city plans encounter a stiff resistance due to the inertia of the public mind in adjusting itself to the increasing importance of collective action brought about by growing congestion. In some communities such regulations as have been adopted are mere expedients to give some measure of immediate relief. Only recently has there been any tendency to get down to fundamentals.

Probably the most neglected and at the same time most important factor in modern city development is common carrier transportation. Failure to give transportation adequate consideration results in such facilities lagging behind the needs of the community. Even today, comparatively little progress has been made in considering transportation as a whole in its relation to city growth. There is increasing need to plan adequately for the development of future facilities on a scale which will enable each step in new construction to be made as part of a co-ordinated system. Progress demands that transportation be recognized as a constantly changing and developing art. The growth of the city itself brings new conditions and new requirements. This has been complicated by legislative attempts to fix for long periods of years conditions of operation that vary from day to day in accordance with economic and social changes. Community transportation has been treated as a fixed rather than a developing art. Consequently such progress as has been made is best described as a series of stumbles.

There is considerable encouragement in the growing approval of the terminable permit form of franchise. This arrangement eliminates the recurring periods of retarded development that are brought about by approaching expiration of fixed term grants and at the same time makes it possible to keep the transportation system of a city attuned to changing conditions and requirements.

Surely the time is ripe for a broader and more fundamental approach to the local transportation situation. Along with the transportation of passengers between their homes and places of business comes the demand for preferred service in buses or taxicabs by those willing to pay the higher cost. The use of streets by trucks and other vehicles for the transportation of goods and commodities must also be taken into account All of these agencies must receive consideration in a broad city plan.

Existing transportation executives with a direct interest in the solution of this vital community problem are the logical leaders of thought on the subject. But the degree of success accomplished will depend on the extent to which they identify themselves in the public mind with the interest of the community as a whole rather than that of a particular agency.

Chamber of Commerce Induces New Level of Thinking

SELF-GOVERNMENT in American business was the outstanding theme at the fourteenth annual meeting of the Chamber of Commerce of the United States, held in Washington last week. Of particular importance was the viewpoint of Secretary Hoover, reiterated by several other speakers, that we are gradually adjusting the nation's industrial system to the instincts of industrial freedom and equality of opportunity. We are also setting up a new relationship in industry which departs widely from that of the old world. This new conception of capital and labor point to a mutual understanding of the problem. As a result, labor-saving devices and better administration are reducing labor costs per unit of production below even those of cheaper labor abroad.

In the transportation field the result of this attitude can be seen in the widespread adoption of the one-man car and the greater productivity of labor in all departments. It is this co-operation which has been essential in keeping up the quality of service while rates have been held down.

Combined with this, a notable growth of a higher sense of co-operation in the whole community was remarked on by Mr. Hoover. Association activities, such as chambers of commerce and trade associations, were commended for the great part they have played in producing a more efficient, more ethical business practice and a better synchronizing of the parts of the economic machine. In no industry has this co-operation been more valuable than in transportation, for its success depends entirely on the service rendered and the recognition of the value of that service by the community.

No one could attend the sessions of this great body without realizing the force the Chamber of Commerce

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has in the community today. Particularly should transportation men realize that they can well lend their support to their local commercial organizations. Both in the local sessions and in the annual meetings there has been introduced a new level of thinking and of business and industrial practice that is having its influence in all parts of the land.

His Formula Works in Practice

SAMUEL INSULL talked frankly about the electric railway situation at the Advisory Council conference in Chicago on Feb. 24. His general theme was merchandising. His formula is an old one to successful sales organizations: "Know your goods, sell yourself; then go after the customer."

That this formula works in the utility business is strikingly portrayed by the record of the properties which Mr. Insull heads. The record speaks for itself, but it is further emphasized by the fact that the National Electric Light Association at its convention this week again awarded the Coffin prize to an Insull property, the Commonwealth Edison Company of Chicago.

Electric railway operation today encounters problems peculiar to itself. But one thing of direct interest stands out in the record on which this latest award was made. Mr. Insull's formula works. In Chicago, 94 per cent of all homes use electricity. That record is the result of merchandising. A good sales job has been done there. The record of his electric railway properties likewise shows that the same formula works in the transportation business.

Public Transportation an Essential Industry

WERE additional evidence needed of the essential character of public transportation it would be found in the report recently made to the Traffic Survey Commission of Baltimore by Kelker, De Leuw & Company, a portion of which is abstracted in this issue. Many counts were made of the relative use of various transportation means. It was found that out of a total of 79,831 persons employed in the downtown district 64,664, or 81 per cent, use the public facilities offered them for transportation. Those using automobiles and taxicabs were only 8.5 per cent of the total, while the remaining 10.5 per cent walked. And this was in a city which the engineers state is more than usually compact.

Similar counts of workers in the principal industrial districts somewhat outside the congested zone show that while a far greater proportion of the workers walked, or 36.7 per cent of the total, only 7.3 per cent depended on private automobiles. This is the more surprising in that it is frequently assumed that the automobile is used to a greater extent in those localities where the space limitations for parking are less severe.

Another interesting count shows that the average airline distance of the residences of the street-car riders from their work is 2.52 miles, the steam and interurban railroad patrons 3.20 miles and the users of passenger automobiles 3.30 miles. This would indicate that as the distance to be covered becomes greater the advantage of taking a direct ride in one's own car becomes relatively more.

These observations go to show that there is room for more study on the reasons why some automobile owners prefer to use their own cars. With the reasons ascertained, it should be possible to plan public tranportation that will appeal directly to this class. For, small as it is, compared with those who use the rail and bus lines, it is the cause of a major portion of the congestion that is choking the streets of the cities. This was seen from the cordon count, which showed that 60 per cent of the total number of vehicles entering and leaving the central business district were passenger automobiles. Therefore anything that can be done to attract the automobile riders to public transportation lines will make a favorable showing in the relief it will bring to traffic congestion.

$1,000,000,000 Traction Investment Subject to These Men's Judgment

NEW YORK has a new deal in regulation. Tammany and its cohorts have had their way. It was all a matter of attrition. Inch by inch the Republicans gave ground. Finally, they capitulated. To cover the happenings between the first attempt completely to Tammanyize New York City and the recent culmination in the appointment of the new Transit Commission by Governor Smith would be to write much recent political history. That is not necessary here. Forget the measures and examine the men! Governor Smith, self-pronounced friend of municipal ownership, has made a good record in office. The fact remains, however, that he is in a position to direct the transit policy of New York City. The Board of Transportation, although appointed by former Mayor Hylan, is controlled by two of the Governor's life-long friends. Now, by his appointment of three new members of the Transit Commission, that body has come under Democratic domination.

It is the principle, however, more than the politics, that is of interest. True, under the former arrangement of divided responsibility, with the Transit Commission on one side and the City Board of Transportation and the Board of Estimate on the other at loggerheads, there was no chance to get anywhere. Particularly during the administration of Mayor Hylan did a condition of open warfare exist. Since the first of this year under Mayor Walker the olive branch has been much in evidence, but time did not permit it to be ascertained whether this was merely a gesture. Just before the members of the old Transit Commission were decorated with the lily of oblivion by the Legislature the commission voted two to one as a fitting Parthian shot to require the Interborough to spend $22,000,000 for new construction and new cars. And then the members feelingly added as an afterthought that, perhaps, the city could be induced to stand part of the cost. So passed out of the picture the men Hylan characterized as "tools" of the "traction crowd." Certainly the words never did fit the action of the old commission, but that meant nothing to Hylan.

Anyway, the Democrats are in the ascendant and their voices are being heard. The first is that of Transportation Commissioner Delaney. He tells City Comptroller Berry, an independent, that $100,000,000 must be found at once or work will soon have to stop on the new system of subways intended for city operation. And Mr. Berry says the city's borrowing power has been exhausted and that if Mr. Delaney is to have his $100,000,000 the amount will have to go into the tax budget. At which the taxpayer groans, for while

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New Cars More than Pay Their Way

The Atlanta Management Believes in Modern Rolling Stock and Started on Its Campaign of Replacing Old Cars with New in 1922—One Hundred and Twenty New City Cars, About One-Third of the Total Number, Have Been Ordered During 1925 and 1926—New Cars for Interurban Lines Also

LARGELY through the addition of improved rolling stock and the scientific selection of the types of car to use, better public relations have been established in Atlanta and better financial conditions exist on the property of the Georgia Railway & Power Company. This was pointed out in an article in this paper for May 8.

The purchase of modern low-level four-motor cars for city service in Atlanta began in 1922, when the company purchased twenty cars of what is known as the "600" type. In 1923 twenty more cars of this type were built in the shops of the company, and in 1924 still twenty more cars of this type were ordered. These cars were received in 1925. Later the same year twenty cars of the "800" type were put in service, and still later in the year 40 "900" type cars were added. The accompanying engravings illustrate all of these types of cars and some of the earlier models.

The 40 cars of the "900" series, put in operation late in 1925, were the first designed for one-man operation to be used in Atlanta. Before their arrival some people were skeptical of their advisability because of the race problem, but a thorough trial has demonstrated the service by these cars to be a success. The fact that there are both front and rear exits helps the situation mentioned. The cars are painted green and cream, colors different from those of the other cars, and they are very attractive in appearance.

Before the last order for 60 cars was placed in March of this year the company made an exhaustive study of the type of car and equipment best suited to its conditions, including seating capacity, arrangement of seats, type of seats, etc. These studies took into consideration cars of a seating capacity of 32 up to 52.

The method followed was to make traffic counts for each line during different periods of the day, and sufficient counts were taken so that the average distribution for each line was determined. Obviously, however, the choice of equipment was not made on the conditions shown directly on these curves, because after their purchase the cars would have to run for ten years or more, so that conditions five years hence were taken as the average which they would meet. Hence, the curves were expanded and otherwise modified to represent traffic conditions expected in 1931.

On the traffic charts thus compiled the transportation engineers of the company plotted the cost of giving efficient service with cars of different seating capacities. The result of this study soon showed that the choice lay between a 40-seat and a 48-seat car. In the more detailed study then made of the relative merits of these two types consideration was given to the saving in energy from the operation of the 40-seat car, whose weight was taken at 32,000 lb., the gain which should be expected from the shorter headway with the shorter car, etc., against the higher platform cost per seat,

Extracts from Specifications for Last Order for Cars—Atlanta

The following extracts are taken from specifications covering 60 cars ordered by the Georgia Railway & Power Company in March, 1926

GENERAL DIMENSIONS

Length over dashers	45 ft. 4 in.
Length over body	33 ft. 1 in.
Length of platform	6 ft. 1 in.
Height, rail to top trolley boards	11 ft. 2 1/8 in.
Height, rail to first step	15 1/4 in.
Height, step to platform	14 1/2 in.
Ramp in car floor	3 1/4 in.
Post centers	29 1/4 in.
Clear height inside	7 ft. 11 3/8 in.
Width over eaves	8 ft. 3 3/8 in.

GENERAL INFORMATION

Seating capacity	48
Width of seats	34 in.
Width of aisle	27 in.
Width of front-entrance door	50 in.
Width of rear-exit door	32 1/2 in.
Truck centers	20 ft. 6 in.
Wheelbase	5 ft. 4 in.
Size of wheels	26 in.

Roof—Car body roof will be of the monitor type.

Doors—All doors will be sliding, operated by National Pneumatic Company's door engine. Rear door will be treadle-operated and provision will be made so that street collector can open this door from the outside with a key.

Curtains will be installed at all body windows, and there will be operator's vestibule curtains; material, pantasote.

Heaters—Each car will be equipped with twelve panel type electric heaters made by the Consolidated Car Heating Company and equipped with thermostatic control.

Seats—Each car will be equipped with twenty Hale-Kilburn No. 400 reversible cross seats, 36 in. over all. Seats will be framed of wood and fitted with springless canvas-lined rattan panels in cushions and backs. Four longitudinal seats with same cushions and backs will be provided. One folding operator's seat with wood top on each platform.

Hand Brakes—The National Brake Company's Peacock staffless brake gear, ratio 12/52 with 20-in. iron brake wheel, will be installed in each vestibule.

Fenders—Each end of car body will be equipped with one "Atlanta" type drop basket life guard.

Mirrors—The cars will be equipped with mirrors to give the operator a full view of the interior of the car.

Trucks—Car body will be mounted on Brill 177-E-1 trucks with Stucki side bearings. Brake pins 1 1/8 in. in diameter.

Electric Equipment — Four General Electric Company's 265-A, 35-hp. motors with K-35-JJ controllers and line breaker for double-end operation.

Gears — Thirty cars to be equipped with General Electric Company's No. A-1 combination tempered and case-hardened long and short addendum tooth type.

Lightning Arresters—Aluminum cell lightning arresters to be installed on the platform No. 1 end.

Air Brakes—Westinghouse Air Brake Company's double-end, straight air brake equipment with all emergency and safety features, including DH-16 air compressor, 8 in. x 12 in. brake cylinder, Westinghouse R-4 type governor, M-28 brake valve, two 14 in. x 42 in. enamel air reservoirs, American Brake Company's type E-1 slack adjuster.

Safety Equipment—Full double-end safety car equipment as furnished by the Safety Car Devices Company.

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increased traffic congestion, street accidents and other disadvantages accompanying the use of the small cars as compared with the large ones to provide the same number of seat-miles.

In this detailed comparison it was found that on the twelve more important routes the 48-seat car was the more desirable, but on the twelve other routes, with less traffic, the smaller and lighter car with a seating capacity of about 40 would be more economical. The decision was finally made to place the order for the 60 cars, all to be of the 48-seat type, so as to equip the more important lines first.

The car color decided upon was similar to the olive green color used on the other cars, except that, as stated, all safety cars have a cream trim, which makes them easily distinguishable from the two-man cars. A summary of the specifications for the new cars accompanies this article. The new cars ordered are said to be the first in this country to be built completely under the rules adopted late in 1925 by the National Board of Fire Underwriters. Owing to the fact that they are being built entirely in accordance with the national requirements, an annual saving in premiums of $7.25 per car was secured.

Operating Gains from Improved Rolling Stock

As explained, the company has been operating modern types of cars (though mostly two-man cars) since 1923, so is in a good position to report on the benefits gained from their use. Those resulting from more attractive and more easily accessible rolling stock are rather hard to evaluate in dollars and cents, but the savings connected with the maintenance, larger capacity, increased speed and reduced accidents are susceptible of much more definite determination.

Table I gives a comparison of maintenance expenses in cents per car-mile, as determined by the records of the company. The new cars are those of the four-motor type or "600," "800" and "900." The "old cars" taken for comparison in this table are those of the same capacity as the new cars but purchased prior to 1922. The "600," "800" and "900" type cars, as previously explained, are very nearly alike in dimensions, capacity and electrical equipment, the chief difference being that the "900" cars are one-man cars and equipped with all safety features. The gain of the new cars in the cost of power and in maintenance of equipment and way and structures is due principally to their lighter weight. The saving in conducting transportation is due to their ability to maintain faster schedules.

TABLE I—SHOWING COMPARATIVE OPERATING EXPENSES IN CENTS PER CAR-MILE

	New Cars	Old Cars
Maintenance of equipment	2.18	2.49
Maintenance of way and structures	2.13	2.44
Power	5.03	5.74
Conducting transportation	13.39	14.05

The company estimates that with these savings and those due to larger capacity, increased speed and reduced accidents, the gain from the operation of the 60 new one-man cars ordered will be $210,142. This gain is based on a comparison of the costs of operating the new one-man cars and the old two-man cars which will be retired. The cars to be retired will be partly double-truck and partly single-truck cars.

On the routes where the new cars replace double-truck cars the saving will result from lighter weight, some increase in speed and the use of one man instead of two. Where they replace single-truck cars of 28 seats capacity fewer car-miles will be required because of the larger capacity of the cars. The aggregate of all of these savings is the sum mentioned.

Incidentally during the last five years, it might be said, the company has increased the scheduled speed on its city lines from 9.18 m.p.h. in 1920 to 9.79 m.p.h. at present. This gain is despite a slowing down of about 1 mile an hour in the business district following the introduction of traffic signals. The increased speed is attributed largely to better acceleration and braking through four-motor equipments and improved brakes.

Situation on the Interurban Lines

Owing to the long distances between large cities in the Southern states there has not been the same development of interurban lines in that section of the country as in the North. The Georgia Railway & Power Company, however, has two high-speed lines, built for the greater part of the distance over its own private right-of-way, reaching suburban towns about 18 miles in each case from the center of Atlanta.

The service given on these lines is similar to that on the interurban lines in the Central states and the cars are run on about 1-hour headway. One line is known as the Atlanta Northern and reaches Marietta. The other is known as the Stone Mountain line and passes through Decatur en route.

The five new cars for the Atlanta Northern Railway are 52 ft. in length, with a smoking compartment and individual cushion seats. A new departure will be made by naming each car, like the sleepers and chair cars in Pullman service. The names given will be those of people who have been distinguished in the history of Georgia but are not now living. These names will be put on in gold letters on a red background. The remaining finish of the cars will be quite striking, as flamingo will be used as high as the water table and cream to the letterboard. The roof will be yellow.

These interurban cars will be equipped with multiple-unit control so that two-car trains can be operated, and there is a conductor's door at the end so that one conductor can collect fares in both cars. They were purchased from the Cincinnati Car Company and were to be delivered in May. Five similar cars have been purchased for the Stone Mountain line, to be delivered in June.

At present the Atlanta Northern line is being operated by two types of cars. One is the type "300" car bought in 1905 and weighing 67,000 lb. There are five of these cars and they will be scrapped when the new cars arrive. There are also four large cars purchased in 1921, each with four 100-hp. motors. These will be used as motor cars with a trailer to make a two-car train, the cars being permanently connected for traffic. That is to say, they are not disconnected except when one of the cars has to be sent to the shop. These trains will be used during the rush hours and the new light cars for the basic schedule.

On the Stone Mountain line the present equipment of six cars, which are more modern, will be retained, except that four of the cars will be connected up to make multiple-unit trains, and the five new cars ordered will be used on the basic schedule.

Before the order for the light-weight interurban cars was placed for the Atlanta Northern the company made

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an extended study of their possibilities from a financial standpoint very similar to that conducted for the city cars, and before ordering new cars determined that operating economies of $27,383 a year were possible. This figure was based on the cost for the five cars and accompanying equipment of $123,750 and annual charges for interest and depreciation of $13,200. This left a net saving of $14,183 on the investment. The total cost as given includes changes in tracks, carhouses, etc., as well as the cost of cars, and the net saving was based on a proposed operating schedule which will provide more cars than at present. The annual platform expenses for the light-weight car were taken as $22,141 and for the present equipment as $32,193.

Some of this saving in lower platform cost is due to the smaller number of employees required per car from one-man operation on single cars and two-man operation on two-car trains and part is due to saving in dead mileage from storage of cars in Marietta. The figures of the proposed operations, it should be stated, include some use of the older equipment during rush hours, as already explained.

It is estimated that the increased revenue from the improved service will amount to about $20,000 a year.

Table II gives estimated figures for maintenance and power for the new equipment selected and for the present equipment. The figures relate to the Atlanta Northern Railway.

TABLE II — ESTIMATED COSTS IN CENTS PER CAR-MILE FOR MAINTENANCE AND POWER, ATLANTA NORTHERN RAILWAY

	With New Cars	Present Equipment
Maintenance, way and structures, motor car	2.095	3.300
Maintenance, way and structures, trail car	.....	1.170
Maintenance, equipment, motor car	1.500	2.193
Maintenance, equipment, trail car	.....	0.598
Power, motor car	5.490	9.452
Power, trail car	.....	4.140

While, as stated, the figures given are for only one of the interurban lines of the company, it is expected that the savings on the other interurban line will be not greatly different from those mentioned.

Interstate Bus Regulation Desirable

The History of All Industry Shows that Control of Competition Between Utilities Is Desirable—Interests of Manufacturers of Automotive Vehicles Should Gain, as Risk Would Be Removed—Mistakes of Earlier Regulation Should Be Avoided

By John A. Ritchie
President Yellow Coach & Truck Manufacturing Company

TO REGULATE or not to regulate? That is the question about interstate motor vehicle traffic. For although 41 states do regulate intrastate traffic, there is as yet no interstate regulation such as there is with steam and electric railroads.

The history of industry sheds light on the problem, though Bernard Shaw is reported to have said, "The great lesson of history is that no one learns any lesson from history," and Henry Ford said, "History is bunk." Neither of them was right, however, for we do learn lessons from history. We find that regulation arose from necessity and has developed by orderly evolutionary process.

When did regulation begin? In the days of pure savagery the sole and ruling social philosophy was the welfare of the individual. The savage, whatever else he lacked, had complete personal liberty. No one has had it since, for as savagery developed into barbarism and barbarism into civilization restrictions or "regulation" of personal liberty became greater and greater, and all in the general interest. The history of civilization is the history of progressive curtailment of personal liberties. In all civilized countries the welfare of society as a whole now far outweighs all concern over the individual.

This evolution in political rights and usages has had its counterpart in industrial rights and usages.

The necessity of regulation grew out of evils due to unrestricted competition, or, as it is generally called, "cut-throat" competition. From the time of Adam Smith, the first great economist, and for more than a century, the slogan "Competition is the life of trade" was accepted without question. But in time it was found that unrestricted competition was often the death of trade.

The belief was that competitors, in seeking trade, would try to excel each other in quality of output and reasonableness of prices. But it did not always work out that way. Many evil results arose from cut-throat competition, such as unrestricted child and female labor, corruption in public office, strangulation of competition by rate wars, rebating, greatly increased "overhead" or cost of doing business, needless duplication of facilities, and economic waste of many sorts, the cost of which all came out of the ultimate consumer in higher prices.

The problem is to preserve that idea involved in the word "competition" which we call "emulation" (or the effort to do things better and cheaper) while eliminating the evils of cut-throat competition. Thus the principle of regulation in industry arose, as a step between unrestricted private ownership and control and governmental ownership and control.

In the early days railroads, electric cars and stage-coach lines were regarded as much private business as a grocery store; but it was not many years before the fact that they were "impressed with the public interest," to use the legal phrase, became evident to everybody. The necessity of some regulation was clear and they were placed in that special legal category of businesses which affect the lives of every one and are called "public utilities."

It was recognized that in consolidation and unit control great economies could be effected. Economically centralization had its advantages. But the private control of prices was regarded as a source of evil, so pub-

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lic utilities are no longer permitted to make their own rates; they are established by regulatory authority. While the power of oppression has gone, the economic advantages of co-ordination remain. And in a true sense public utilities are no longer evil monopolies. They are unified or co-ordinated industries.

The commercial transport of passengers and goods by automotive vehicles is a relatively new addition to our complete transportation machinery. The important thing to recognize is that it is a part of our national transportation machinery and, since it affects the electric railroads and the steam railroads, the nation has a very proper and deep concern in the basis on which it is or may be operated. To depend on individual competitive interest as a regulator is utterly to ignore the lessons of history. So the question is not so much one of recognition of principle as it is of the application of the principle. Has the time arrived for it, and what should the necessary legislation provide?

About these questions there is a great divergence of opinion and it will take time to pass the inevitable period of heated controvery to find all the basic facts and on them crystallize wise opinion in behalf of legislation making for the national welfare, upon which individual welfare depends.

In general, the interstate transportation agencies, electric and steam railroads, now under interstate regulation, feel that the new agency should also be regulated.

The organized motor coach operators feel the same way. Evidently some lessons have been learned from the cut-throat competition of the jitney period. Probably motor coach regulation now would not be premature, since the industry itself is for it.

WHY TRUCK OPERATORS OPPOSE REGULATION

But motor truck operators, for the most part, are opposed, if not to the principle of interstate regulation, at least to the bill now before Congress and, indeed, any bill at the present time, and it is seldom wise to enact drastic laws with the opinion of the industry all against it. The psychological factor is one of great practical importance.

The truck operators argue:

1. That the total amount of interstate tonnage hauled by common carrier trucks in competition with the railroads is negligible, and, being all short-haul traffic, is not profitable to the railroads anyhow.
2. That trucks cannot economically do a long-haul business, and hence their operation, even though it involves crossing a state line, is essentially local.
3. That their rates average higher than railroad rates because they do the work quicker, pick up at point of origin of traffic and deliver at ultimate destination, and render other special services which railroads cannot render, and for these reasons their service is of special character and not wholly competitive with railroad service.
4. That automotive common carriers are not and cannot become a monopoly, since the customer, at all times, has the alternative of employing the private contract carrier or doing his own hauling, as so many industries are now doing.
5. That interstate regulation of common carrier trucks involves dangers to both private and contract haulage.

There are other arguments, and one may grant the validity of most of them, though, frankly, many untenable arguments have also been advanced, such, for example, as this: That "the railroads have returns guaranteed by the government," a misstatement that has been spread from one end of the country to the other.

Some of these arguments relate solely to the present situation, which is temporary, but we should also look to the future. Certain it is that the persistence of cut-throat competition at any time, in any form of public transportation, either interstate or intrastate, is contrary to the public welfare.

The very nature of the motor coach and motor truck business, covering, as it will in future years, all of the highways of the country, will make it necessary that there be some regulation.

The interstate commerce act in time became so drastic and it was applied so ruthlessly that it began to injure the railroads and limit their ability to serve. The same thing applies to the supervision exercised over street railways by state commissions.

We should aim to avoid all this in any regulation which is proposed for the motor coach and motor truck. The largest users of the motor coach and motor truck are going to be the steam railroads and the street railways. They have an especial interest, therefore, in the avoidance of drastic automotive regulation.

We should ask the question, were this need of regulation put up to the steam railroads and street railways as applying to their own business, whether they would be inclined to suggest the same kind of regulation they have suffered, or, whether they would not be inclined to offer many modifications which would give the railroads ample latitude in administrative and financial matters, and in management? Above all, we should ask them whether they would be inclined to subscribe to the principle that by law the net earnings of the steam railroads and street railway companies in their future automotive activities should be limited to a mere interest return on investment.

It would be better to suffer another year or so of irritation and then enact constructive legislation rather than to act too quickly and suffer ever after from destructive legislation.

EFFECT ON THE MANUFACTURER

Thus far no mention has been made of the particular interest of the automotive vehicle manufacturers, and it is an important factor in the problem.

Given a certain amount of service to be performed in any community, the provision of more facilities than are needed to perform the service represents an economic waste, which the ultimate consumer, in the end, has to pay for. To the manufacturer this can mean only one thing, a market filled with risk, or, to state it more strongly but just as truly, filled with certainty of bad risks, with an unavoidable increase in the manufacturers' prices to take care of those risks.

To sum the situation up as it now appears to us, the following conclusions seem justified:

1. That we cannot escape recognition of the principle of regulation.
2. Since the principle must be recognized our efforts should not be wasted in barren opposition, but centered upon constructive action.
3. That the time for federal regulation of the motor coach industry is generally recognized to be at hand and sufficient bodies of fact and competent opinion are available upon which to base a wise act.
4. That the situation in the motor truck industry is far different and that it would seem wiser to delay regulation in that department until a greater body of facts and a more general consensus of competent opinion in favor of regulation can be obtained.
5. That automotive regulation should avoid the mistakes of previous regulatory acts and put the industry in position to pioneer, to earn adequate returns and thus realize its greatest possibilities for the benefit of the nation as a whole.

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Texas Properties Are Getting Results from Good Merchandising Work

FIRST ARTICLE

Houston, Galveston, Beaumont, El Paso, Austin, San Antonio, Dallas and Fort Worth Companies, Each with Its Own Peculiar Problems, Recognize Transportation as a Competitive Industry, and Are Energetically Developing Modern Merchandising Methods — Efforts Made to Relieve Traffic Congestion and Eliminate Parking

By John A. Dewhurst
Associate Editor ELECTRIC RAILWAY JOURNAL

This Picture of Dallas, from 3,100 Ft. in the Air, Shows the Extensive Development of This Metropolis

UNDER four different managements, the electric railway properties in the eight important cities of Texas are developing novel and effective methods of selling service. One gains the instant impression that in all of these fast-growing cities the personnels consist of wide-awake boosters who take a leading part in civic undertakings, and at the same time are providing an ever-increasing economical transportation service to their respective communities. There was, and still is, much to accomplish in changing the attitude of the public in order that the companies may keep pace with the enormous growth in population.

Dallas has just passed a new ordinance, giving the Dallas Railway a 7-cent fare with five tokens for 30 cents. This breaks the 5-cent fare basis that this city was slow to relinquish. The effect will be instantaneous. The company is already starting to expend $1,500,000 for much-needed extensions and betterments. The text of this ordinance and the plans of the company were presented in an article in this paper for May 1, 1926, page 750.

Interesting in this connection are the 5 miles of track extensions into new territory on seven lines, a part of which has heretofore been served by buses during the development period. The buses thus replaced will be used to extend still further into newly developed communities. Thirty new cars will be purchased and several more will be constructed new in the company's shops. In addition 50 more cars will be remodeled for one-man operation during the next few months.

Public relations in Dallas are the concern of the

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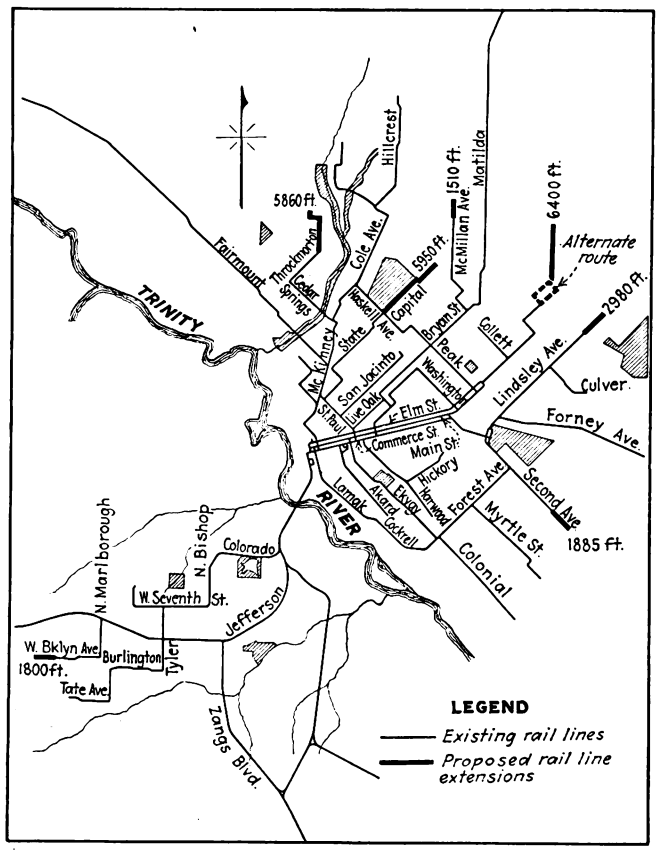
entire personnel. To be sure, they are under the direct leadership of C. J. Crampton, manager of the publicity department, who is directly associated with Richard Meriwether, vice-president and general manager of the Dallas Railway. Both of these men appreciate that the important matters of selling transportation and the establishing of public relations are a part of every employee's job, and can be successful only so far as every man and woman in the company co-operates in the work. As was expressed by T. P. Walker of El Paso at the recent Galveston meeting, public relations work depends on personality, which in turn is composed of a multitude of little things.

Among the duties performed by the director of pub-



Map of Dallas City Lines, Showing the Rail Extensions of Railway Service Planned for This Year as a Part of the $1,500,000 to Be Expended in New Plant and Betterments

lic relations in Dallas is the directing of all advertising and the writing of all car cards for use on the system. In addition to this, the director makes many calls, trying to create at least ten new acquaintances every day. The people visited are the corner grocer, the butcher, or the drug store clerk in various parts of the city. Friends thus established are called on again and again, so that in the course of a year many thousands of people have a direct and frequent contact with a company official. Such men might otherwise never know other than the street car operators on their line. Obviously much valuable information is thus obtained that might otherwise remain a dark secret to the company.

A standing offer exists for suggestions that can be worked into cards of advertisements of five dollars for each suggestion that can be used. In addition the employee's name is used showing the origin of the thought.

In addition to this an informal lyceum bureau is maintained, and every day the Dallas Railway is called on to produce lecture or entertainment talent for various functions, from church socials to rotary luncheons in Dallas and neighboring communities served by the affiliated interurban lines to Denton and Terrell. Not all of such talent comes from the company's staff, and outside local talent is used extensively.

Many Ride-Selling Novelties in Fort Worth

In Fort Worth the street car system stands out above all other industries. One is conscious of a superior system from the time of entrance on the brilliantly painted cars of the Crimson Limited, until riding to the depot on one of the clean white painted single-truck cars or perhaps the latest type "No. 566." After reading the dash signs on all cars, "New model car No. 566 at your service," a genuine interest is aroused. This car is painted a light gray with a cream superstructure and a dark green roof. Inside, the car is fresh and clean, with battleship linoleum on the floor and a white enameled ceiling. The appearance of the fare box has been improved by nickelplating all metal parts. Many of the other cars are painted with white enamel on the exterior, making a very attractive appearance.

Selling rides in Fort Worth is a daily job of thinking up new stunts. Walter H. Burke, manager, and F. G. Gannon, assistant treasurer, have created many novel business-getting methods. When the American Legion had its convention in Fort Worth last fall, this organization wanted to provide its delegates with admissions to all events and transportation to and from places of meeting. The company printed books with the necessary tickets of admission, plus ten coupons, each of which was good for a street car ride during any of the four convention days. These books were distributed at the registration desk and when used the cover could be presented for a new book. At the close of the convention the company counted the coupons collected in the fare box and billed the Legion treasurer for nearly $1,500. Obviously the street cars were used much more extensively than would have been the case otherwise. Also the cost was lower than would have been possible had autos and taxicabs predominated, as so often happens at conventions.

Slogans painted in large letters on the outside of many of the city cars carry the railway's message home very effectively. Some of the slogans used are:

Our service is more convenient.
Parking time can be put to better use.
You are the one inconvenienced by parking.
Save the difference today and every day.
Park not, worry not. Ride the street cars!
Street car shopping is easiest.
Get the street car habit—it pays.
Don't try to park, use our service.
Parking time is money—Save it.
Howdy, folks! It's a pleasure to serve you.

Inside the car are displayed from time to time attractive messages that draw comparisons with facts well known. It is one thing to say the car mileage in Fort Worth is 18,000 daily, and another to say that this equals a round trip to Hong Kong every day. In these days $7,000 does not mean much, but to say that every car equals the price of a good home means much to the average passenger who is buying one and who is struggling to make payments on the mortgage.

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A few of the thoughts used in these car cards are reproduced as being particularly meritorious:

Things Worth Knowing

The steel structure of our tracks weighs nearly 9,000 tons, or as much structural steel as contained in all the buildings in Fort Worth.

600 Horse-Power in Motors

That is the reason the interurban train provides you with speed and dependability.

Things Worth Knowing

The street cars in Fort Worth travel 18,000 miles per day, or the distance from Fort Worth to Hong Kong and back again.

Things Worth Knowing

The street cars in Fort Worth use 55,000 kilowatt-hours per day, or more than is used to light all the homes in Fort Worth.

A Traffic Scene Looking East on Main Street, Dallas, from the Intersection of Field Street

The Payroll

of this company is $1,000,000 per year, or $115 per hour for every hour in the year.

Another Thing Worth Knowing

A street car costs about the same as a good home, from $7,000 for a Birney car to $23,000 for an interurban car.

There is no ordinance in Fort Worth prohibiting smoking on cars, so the following card was designed and found effective in moving smokers to the rear:

Smoking a cigarette, pipe or cigar?
Why not go to the rear of the car?
That's the proper smoking place,
And you won't blow smoke in your
Neighbor's face!

Recently the Northern Texas Traction Company has contracted with a cleaning establishment to call for and clean and press two uniforms a month, free of charge, for every trainman. This costs the company 50 cents apiece for each uniform. Calls are made on a regular schedule. The appearance of the trainmen is naturally much improved.

Due to the scattered development of Fort Worth, relatively more trackage now exists per unit of population than is the case in many cities. Buses have been used for specific purposes previously and were discontinued when the object was accomplished, or when it was found that they were hopelessly unremunerative. On March 14 of this year a new bus line was started to a development at Oakhurst, and four buses now supply a fifteen-minute headway on this 3.2-mile line from 5:30 in the morning until midnight. A blanket franchise was obtained, allowing the company an opportunity of extending this type of service to other communities, as conditions warrant. Five 20-passenger buses were purchased, partly of Yellow Coach manufacture and partly Reos. A 10-cent fare is charged and express service is rendered from the downtown section to the new development at Oakhurst, which is beyond the district served by cars.

Free transfers are given from buses to cars. When a passenger boards a street car and desires to transfer to the Oakhurst bus, he pays a 10-cent fare on the car and receives a bus transfer, thus avoiding a second fare transaction when boarding the bus. This avoids inconvenience and saves time to passenger and operator alike.

Before the bus line was started an extensive selling campaign was instigated. An attractive four-page folder in colors was printed entitled "A New Transportation Service." In the folder a complete description of the new service is given, showing why the Northern Texas Traction plans to operate buses, the type of vehicle to be used, the service to be offered, giving schedule and fares, the route, and closing with a request for suggestions for improving the service. These folders were distributed from house to house by

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the bus operators before the service was started. This gave the operators a valuable opportunity to become acquainted personally with many of the prospective passengers and to add a few words beyond what was said in the folder.

In addition to this, one of the buses was exhibited at the Fat Stock Show. The operators were again present to explain the service about to be rendered and to show visitors the new vehicle.

This year the third public speaking class has completed its course of twelve lessons. The company pays the costs of this instruction. The first class was for department heads; the second year assistants and junior executives were given the course, and this last year many other junior officials received this training, which is valuable because of the many opportunities that are always available for carrying the company's message to local community gatherings.

The Texas Electric Railway, which operates 282 miles of interurban trackage, besides rendering a high-grade service to the many communities served, also supplies a personal service to its patrons through its traffic organization. Any one desiring a Pullman reservation may apply to any agent and the order is telephoned over the company's private system, generally to Dallas, as this is the principal point on the system, where its riders transfer to steam railroads. The reservation is obtained and a confirmation phoned back to the local agent. The reservation is either held or picked up and paid for as instructed by the passenger.

A similar service is performed in obtaining theater tickets, baseball and football tickets, or reservations to any similar functions. Generally the company is able to obtain an allotment of seats to athletic games so that Texas Electric patrons can be assured good seats. These tickets can be paid for at the local company office or they be held and paid for on arrival.

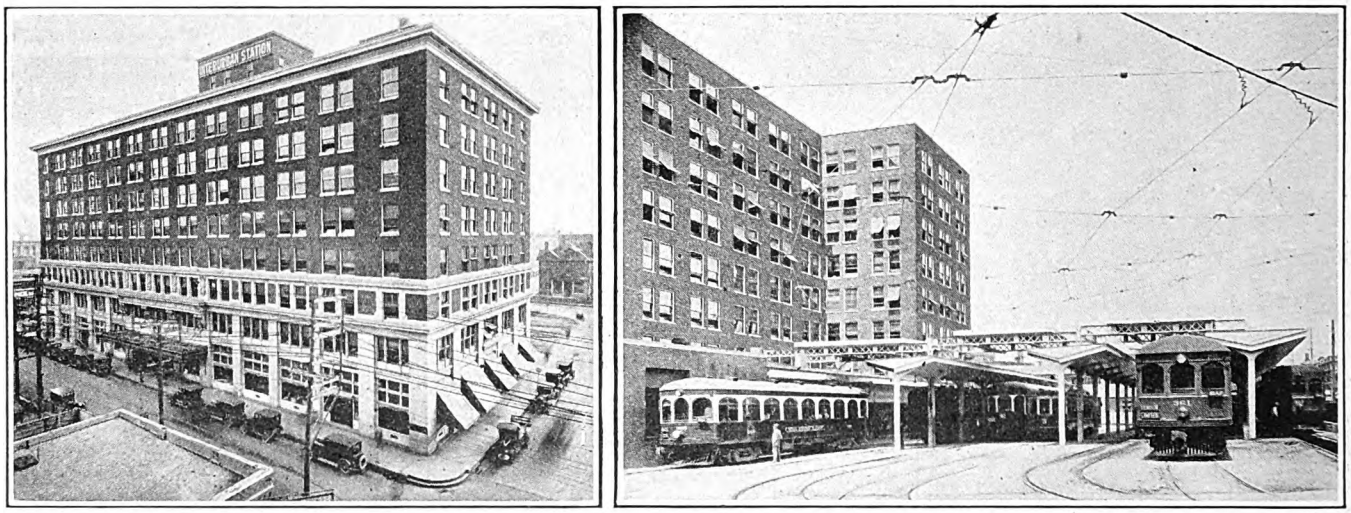
To encourage riding, this company has advertised extensively a 20 per cent reduction in return trip tickets during April and May of this year. Results are not yet available to show whether this has increased riding or not. The standard reduction for return trip tickets is 10 per cent. Many other forms of reduced rate transportation are in effect to meet the individual requirements of the various localities served.

Chartered car rates have been revised so that definite rates are provided for parties of any size. This avoids the bad psychology of requiring a party of 30 to pay for 40 tickets in order to obtain a private car.

James P. Griffin, vice-president of the company in charge of the traffic, has stated that the transportation companies must adapt their service and schedules to fit the requirements of the riders and not expect the public to change its plans to meet the old-time standards of fares and schedules. Traffic rules and methods of handling special business are assembled in a handy book which is given to all agents and conductors.

Railway Operates from Union Bus Station at Rochester

ALL INTERURBAN bus and trolley lines of the New York State Railways in Rochester, N. Y., are now operating from a union terminal. The Rochester & Eastern and Rochester & Sodus trolley lines, hitherto using the terminal at Exchange and Court Streets, now operate from the Bus Terminal building at South Avenue and Broad Street. The old trolley station is to be abandoned.



Front and Rear Views of the Dallas Interurban Terminal Building Used Jointly by the Texas Electric Railway, the Texas Interurban Railway and the Northern Texas Traction Company

The move is in the interests of economy, James F. Hamilton, president of the railways, announced. Under a new routing schedule, the interurban trolley lines are to enter South Avenue via St. Paul and Andrew Streets and leave the terminal through Court Street to Clinton Avenue. No new tracks are necessary.

Where the company has hitherto used the Broad Street, or side entrance, for unloading and loading bus passengers, the entire lower floor of the building has been taken over by the railways and the front entrance used for trolley passengers. The station will be enlarged within a short time.

The merging of the trolley and bus stations will not affect the terminal for the Rochester & Syracuse, Buffalo, Lockport & Rochester and Lockport & Buffalo lines at the Erie Station.

The New York State Railways took over the bus terminal, previously operated by independents, early in 1925, after the traction company had acquired control of every bus line entering Rochester with one exception, the Rochester-Batavia-Buffalo route.

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Better Car Routing and Traffic Control Proposed for Baltimore

FIRST ARTICLE

Report Presented to Traffic Survey Commission of Baltimore by Kelker, De Leuw & Company Proposes Radical Changes in Street Car Lines and Handling of Vehicle Traffic, Particularly in Central Business District—Many Detailed Counts Taken Show Seriousness of the Problem

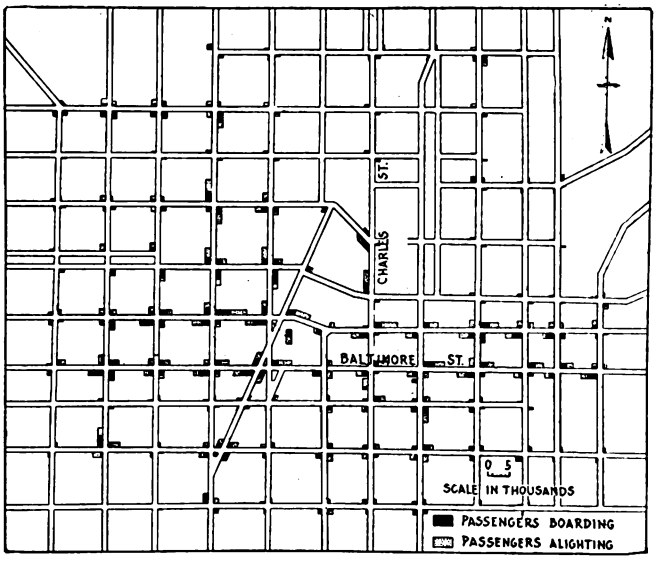
REROUTING of street cars and buses, traffic control and carrying out of a major traffic street plan are the three methods proposed for the improvement of traffic conditions in Baltimore, Md., by Kelker, De Leuw & Company. These recommendations are incorporated in a report presented to the Traffic Survey Commission of Baltimore after an investigation covering six months. While the report states that the efforts of the engineers have been directed to the preparation of recommendations that would specifically conform to local conditions, much of the material contained is general in character and is applicable to similar problems in other cities. The following is a greatly condensed abstract of the principal features of the report.

Development of the modern skyscraper, at first without restrictions as to height, is given as the primary cause of traffic congestion. Zoning ordinances, where they have been adopted, have been of assistance, but, in the opinion of the engineers, there has been no real effort to restrict building construction to conform with the limits which are imposed by the available street space in the zoned areas. Consequently it is not uncommon to find housed in a single building during the working hours a population equivalent to that of a small city, with the street on which the building fronts having sufficient space only for the needs of a small town. To sum up, there are five principal causes of congestion:

1. High buildings, causing concentration of large numbers of people in small areas;
2. Insufficient roadway and sidewalk space in the streets on which such buildings front;
3. The ever-increasing number of pleasure and commercial vehicles without a corresponding increase in roadway space;
4. Failure to provide a sufficient number of well-paved streets and to maintain them;
5. Use of a portion of street space for the parking of vehicles, thereby reducing the space available for moving vehicles.

Among the means which have been adopted by various cities for improvement of traffic conditions the following are listed:

1. Rerouting of street railway and bus lines;
2. Elimination of left-hand and right-hand turns at certain intersections and in certain areas;
3. Control of pedestrian traffic;
4. Elimination of parking, both partial and complete, in congested districts;
5. One-way streets;
6. Automatic signals with unit control;
7. Electric signals manually controlled;
8. Safety zones for street car passengers;
9. Segregation of various classes of traffic;
10. Creation of boulevards and through streets;
11. Minor changes and improvements in roadway and sidewalk design;



Passengers Boarding and Leaving Street Cars in the Central Business District from 6 A.M. to 7 P.M. on a Typical Week Day in November, 1925

12. The removal of obstructions from sidewalks and their full utilization, from building line to curb, for pedestrian traffic;
13. Street opening and widening projects to secure an adequate system of major traffic and distributor streets;
14. Construction of underground or overhead structures for partial removal of street railway lines from the downtown district;
15. Construction of subway or elevated railroads to provide rapid transit service, and
16. Construction of pedestrian tunnels.

The general plan of the downtown streets in Baltimore shows a great similarity to that of a century ago. As the city grew the streets were extended and homes were located along and adjacent to the major radial streets, following the expansion of the street railway system. The congestion in the central area, due largely to the construction of high buildings in the retail, financial and wholesale districts, would be greater were it not for the accomplishment of the Burnt District Com-

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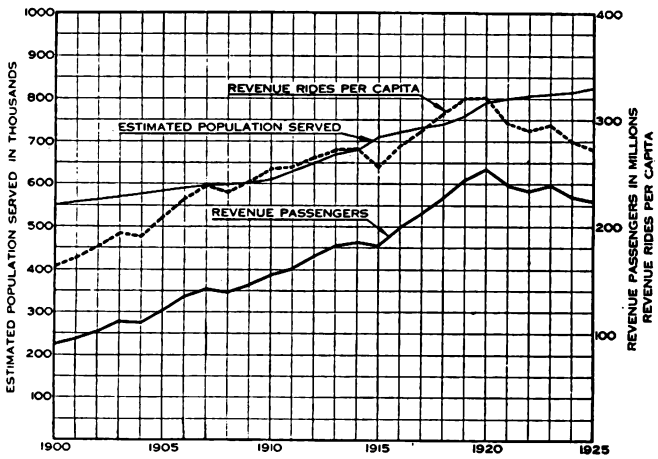
mission in widening the streets after the fire of 1904. The City Plan Committee has done able work in preparing for the future by outlining a system of major streets and also in carrying to completion many important widening and opening projects. The United Railways & Electric Company has extended its lines and increased its service to meet the demands of the growing population. Bus service has been introduced to supplement the street railway service. The routing of the lines has been in general of such a character as to require the least possible amount of transferring and also to follow closely old-established lines of travel in carrying passengers to and from the downtown district.

Despite all the street improvements now under way or in contemplation, and despite the increases in street railway and bus service, the great increase in the use of the motor vehicle has brought about congestion in traffic movements throughout the city, and in the central business district in particular, which requires coordination and additional measures of traffic control so as to obtain the most effective use of the streets.

Growth in Motor Vehicles Enormous

Since 1915, the increase in the number of annual revenue passengers carried by the United Railways has been 42,000,000 (23 per cent) and in motor vehicles registered 61,000 (307 per cent). During 18 hours of



Annual Revenue Passengers Carried, Rides per Capita and Population Served by the United Railways & Electric Company of Baltimore, 1900-1925

a normal week day 176,000 motor vehicles enter and leave the central business district, the corresponding number for the maximum hour of the afternoon rush being 14,000. Using the most accurate data available, and checking carefully with the experience of other cities, it is estimated that at the end of 1930 the number of motor vehicles registered will be 154,000, and that the number of motor vehicles entering and leaving the central business district for the eighteen-hour period will be 308,000 and for the maximum hour 24,000.

With this change in the situation imminent, the problem is not only to relieve the conditions of today but to plan wisely for those of tomorrow. While the recommendations for street railway and bus routing and traffic control may appear radical and drastic, say the engineers, if nothing is done shortly to reroute the street car lines and effectively to co-ordinate traffic control, these measures will seem mild when compared to the regulations required to meet the conditions five years hence.

Rerouting of street railway lines in a large city is a complicated matter, as the limitations imposed by street space, track capacity and service require that each line be fitted in carefully with the other lines to make a complete and workable plan. Obviously, no rerouting plan can be proposed that will exactly divide the benefits and inconveniencies for each one of the million daily passengers of the car lines and for the several hundred thousands of motorists who use the streets. The recommendations will benefit greatly the large majority of all persons using the streets and will be, if adopted, a long step forward to meet traffic conditions of the future, in the opinion of the engineers.

A summary of the recommendations follows:

Street Car and Bus Routing

(a) A detailed rerouting plan is given later in the report. In the most congested portion of the downtown district nearly 70 per cent of the turning movements made by street cars are eliminated and in the entire area bounded by Greene, Centre, Gay and Camden Streets the reduction in turning movements is 35 per cent. All traffic movements will be benefited by the discontinuance of street car operation on Lexington, Saratoga and Sharp Streets.

(b) A "limited stop" service which will decrease the number of possible stops during the rush hours only, from ten to about eight per mile, is recommended. During the day from 9 a.m. to 4 p.m. and also during the night hours after 7 p.m. all present stops will be made. This change will not only decrease the traveling time of the vast majority of car riders but will also save considerable time for motorists.

(c) The increase in traffic in the downtown district since 1916 has been such as to require a modification in the street railway service standard and it is recommended that the 15-minute period by which violations are determined be extended to a 30-minute period.

(d) When street railway tracks are reconstructed in the downtown area realignment is recommended so as to remove a number of points of congestion by making a more equitable distribution of roadway space.

(e) The shortening of the existing loop used by all bus lines entering the downtown district on Fayette Street is recommended, as well as the installation of new bus lines in parts of the city where transportation is now lacking, such as on Washington Boulevard and on Annapolis Boulevard.

Traffic Control

(a) The immediate installation of automatic signals is recommended at 14 intersections in the central business district and a later installation of the same type of signals at 64 additional intersections, making a total of 78. In the outlying districts of the city the installation of automatic signals is recommended at 34 intersections and this number is to be increased to 76 by subsequent additions.

(b) With the installation of the automatic signals it is recommended that measures be taken to co-ordinate the movement of pedestrian traffic with the signals. This is one of the most effective safety measures that can be adopted and it has a further advantage in that it facilitates the movement of all classes of traffic.

(c) While there is no present need to prohibit parking throughout the day in a large portion of the downtown area, there is no doubt that traffic conditions would be improved if the present regulations were extended to cover a slightly greater area and the period of pro-

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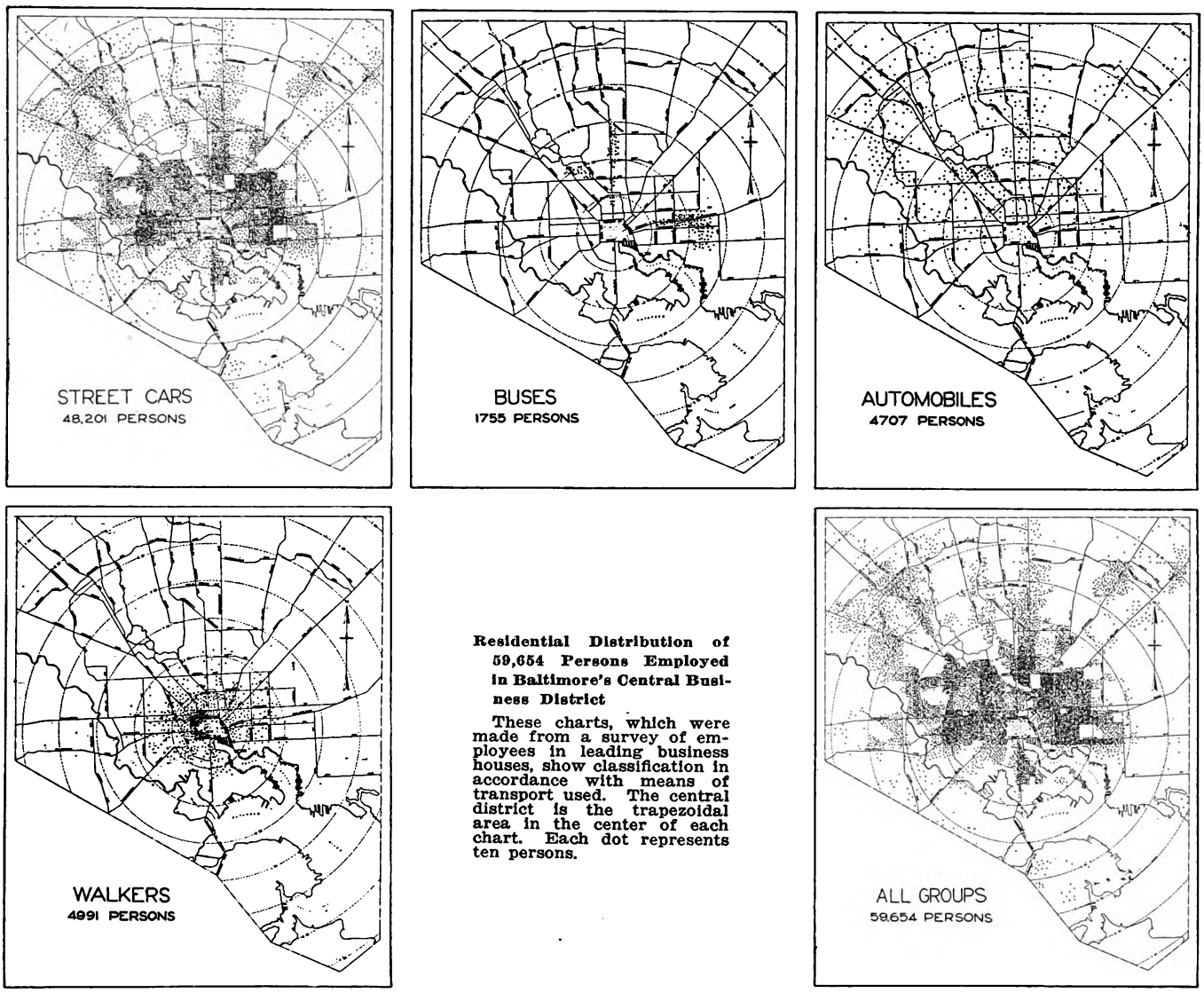

Residential Distribution of 59,654 Persons Employed in Baltimore's Central Business District

These charts, which were made from a survey of employees in leading business houses, show classification in accordance with means of transport used. The central district is the trapezoidal area in the center of each chart. Each dot represents ten persons.

hibition in the afternoon advanced from 4:45 p.m. to 4:15 p.m., and these changes are recommended.

(d) Because of delays occasioned by the delivery of coal during the periods of heavy traffic movement, it is recommended that such deliveries in the downtown district be made at times other than during the morning and evening rush hours.

(e) A change in the existing statutes and laws pertaining to traffic regulations is recommended so that all vehicles moving on street car tracks, in addition to street cars, shall be passed on the right. The change is desirable as a safety measure and also to facilitate the movement of traffic.

(f) On many of the sidewalks and roadways in the downtown area there are numerous obstructions such as cellar entrances, light wells, steps, fruit and vegetable stands, etc. Such obstructions should be removed wherever possible.

(g) The adoption of a system of through streets, in the interest of safety and improved traffic conditions, is recommended. For the initial step 18 streets have been selected and this number, by subsequent additions, should be increased to a total of 39 streets.

Major Traffic Street Plan

(a) The major street system designed by the City Plan Committee has been carefully studied in connection with many traffic counts, surveys and observations of the physical conditions affecting the plan. As a result of this work this plan as outlined, with a few modifications, is fully indorsed.

(b) A system of inner distributor streets encircling the central business district is recommended, utilizing as far as possible existing streets of adequate widths. The essential work can be carried on by progressive steps to meet the increasing traffic of coming years.

(c) To supplement the inner system an outer distributor street system is also recommended. The downtown street system cannot care for both the local and through traffic, and a convenient system of streets must be provided for the through traffic so that it may be deflected from the streets in the downtown area.

(d) To insure adequate means of egress and ingress to the downtown district the widening, when possible, of a number of the existing arterial thoroughfares is recommended.

(e) The widening and opening of both Howard Street and Franklin Street and the construction of the Franklin Street viaduct, together with certain streets connecting with the inner distributor street system, are recommended.

(f) The opening of an east-and-west street between North Avenue and Cedar Avenue which will connect the section of the city lying east and west of Jones Falls is recommended.

(g) In the central business district the widening of

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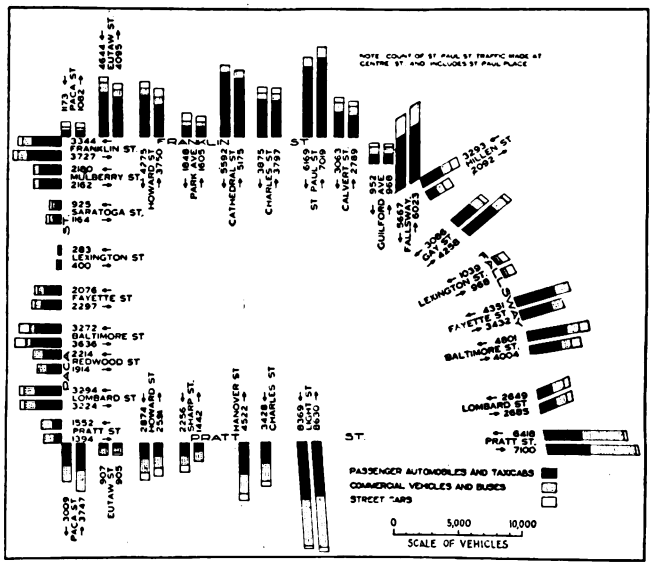
Pratt Street between Light and Paca Streets, together with some minor improvements, is recommended.

(h) Some of the recommendations contained in the report of the Committee on Traffic (1923) are being carried out and a number are covered directly or indirectly in this report. Other important items of the 1923 report are recommended.

BALTIMORE'S POPULATION CONCENTRATED

For a city having such a large population (at present estimated 790,000) Baltimore is unique in that so great a proportion of its people reside within a comparatively short distance from the central business district.



Number of Vehicles Entering and Leaving the Central Business District of Baltimore from 6 A.M. to 12 o'Clock Midnight on Oct. 19, 1925

Approximately 625,000, or 79 per cent, reside within a radius of 3 miles from Baltimore and Charles Streets. Recently there has been considerable development in the outlying residential zones, which has caused a small reduction of the population in the inner zones and a corresponding increase in the outer zones. The density of population by mile zones is as follows:

DISTRIBUTION AND DENSITY OF POPULATION IN BALTIMORE, 1925

Zone Radius, Miles	Population Accumulated Totals	Per Cent of City Total	Persons per Acre (Land Area Only)
1	120,200	15.2	64.8
2	435,100	55.0	60.4
3	625,100	79.1	40.3
4	693,400	87.7	25.9
5	752,500	95.2	19.4
City Limits	790,600	100.0	15.7

Note: Circles centered at Charles and Baltimore Streets.

The zoning regulations limit the height of buildings in the central business district to 2½ times the width of the street on which they front. The average height of buildings in the district bounded by Franklin, Calvert, Lexington, Holliday, Pratt and Paca Streets is now four stories or about 52 ft. Under the zoning regulation enough additional high buildings could be constructed to bring this average up to 17 stories or 180 ft. Although the height regulation is as sound as in any other city a concentration of business activities four times greater than that of today is possible. The volume of traffic on sidewalks and roadways which would result unless there were a corresponding increase in their width can scarcely be visualized.

The existing street railway system comprises some 35 lines, the cars on 27 of which operate into and out of the central business district. In addition to the street railway lines there are three bus lines reaching this district, and several lines in the outlying districts where buses are used as feeders to street railway lines. In all, the United Railway & Electric Company operates 415.8 single-track miles of street railway lines (60 of which are on private right-of-way and 18.5 on reserved portions of streets), 47.7 miles of bus lines and 6.6 miles of trackless trolley.

Of the 316,428,497 revenue and transfer passengers carried during the year 1924, 260,453,100, or approximately 82 per cent, were carried on the lines which give direct service to the central business district. Of the remaining 55,975,397 passengers 2,095,223 were carried by shuttle service lines which are virtually extensions of lines operating to the central business district. The crosstown feeder lines carried 53,880,174, or approximately 17 per cent of the total passengers.

A count of the number of passengers boarding and leaving street cars in the central delivery district (the area bounded by Greene, Centre, Gay and Pratt Streets) was made during November and the early part of December, 1925. The chart on page 883 shows in diagrammatic form the total number of passengers boarding and leaving cars at each corner during the 13-hour period from 6 a.m. to 7 p.m. on a typical week day. It will be noted from this diagram that a large part of the delivery and pick up of passengers is made in a comparatively small area. As a matter of fact, of the 396,000 persons observed in the entire central district 136,000, or over one-third, got on and off the cars in the area bounded by Howard, Saratoga, Charles and Baltimore Streets, which is about one-ninth of the area of the entire district. This indicates the necessity of operating a large number of cars on the tracks in this area if the patrons of the street railway lines are to be served conveniently.

Revenue passengers increased gradually from 155,000,000 in 1910 to a peak of 254,000,000 in 1920, decreasing to 224,000,000 in 1925. This falling off in revenue passengers can be attributed partly to a decline in post-war activities, partly to the increase in the use of passenger automobiles, partly to the use of second transfers and partly to the extension of zone fares. The number of revenue rides per capita served was 272 in 1925 compared with 254 in 1910 and 321 during the peak year, 1920. This information is shown graphically in one of the charts.

The quality of service has been well maintained. As a matter of fact, the seat-miles have been increased at a more rapid rate than the car-miles, which have kept pace with the number of passengers. The street railway system is being managed efficiently, but if the passenger traffic continues to decrease new methods of reducing the operating cost, in addition to those which have been put into effect during the past few years, will have to be employed. Among the possibilities that present themselves are rerouting, "limited stop" service during the morning and evening rush hours, provision of more cars of the type that will save time by making faster interchange possible, and the adoption of a method of selling tokens and of issuing transfers that will reduce delays in loading.

Three of the railway's bus lines operate to and from the downtown district. Two of these are operated on

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a seat-for-every-passenger basis at a 10-cent fare. They do not compete directly with the cars. The Fayette Street bus line, largely controlled by the United Railways, is operated in direct competition with the street cars. The latter could easily perform the service rendered by these buses.

In addition to the local street cars and buses there are several interurban and interstate bus lines which take up considerable space operating over and standing in congested streets. The majority of the interurban bus lines operate from the city limits to various suburban communities.

Street Traffic Analyzed

In order to obtain all pertinent facts with respect to street traffic conditions in Baltimore field surveys were made including (1) a cordon count of all vehicles and passengers entering and leaving the central business district; (2) a count of vehicles at nearly all the intersections in this district; (3) a count of pedestrian traffice at principal points of sidewalk congestion; (4) a check of the speed made by automobiles on various streets; (5) a count of vehicles at principal intersections throughout the municipal area, and (6) a survey of the speeds made by the principal street railway lines.

The results of the cordon count are shown in one of the diagrams. An analysis of the count shows that out of a total of 206,653 vehicles, the division was:

Type of Vehicle	Number	Per Cent
Street cars	19,138	9.2
Passenger automobiles	123,906	60.0
Taxicabs	5,840	2.8
Buses	1,111	0.5
Commercial motor trucks	45,697	22.2
Horse-drawn vehicles	10,961	5.3

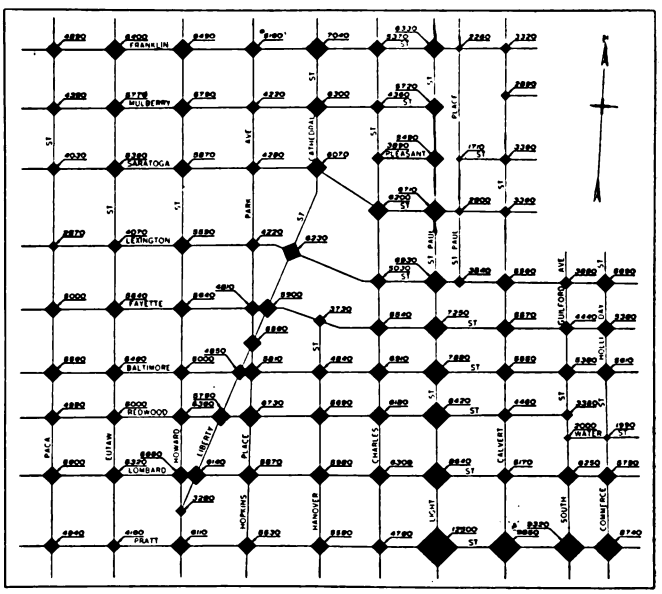
During the hours from 7 a.m. to 6 p.m., 160,120 vehicles entered and left the central business district, an average of 14,556 per hour, and during the hour from 5 to 6 p.m., the maximum traffic hour of the evening rush period, the number entering and leaving was 16,566. The count shows that the large majority of commercial and horse-drawn vehicles, the slower moving types, used the streets in the southern portion of the district. Of a total of 56,658 commercial and horse-drawn vehicles 26,677 or an average of 2,223 per checking station crossed the 12 stations on the cordon south of Baltimore Street, while 29,881 or an average of 1,428 per checking station, crossed the cordon at the remaining 21 stations north of Baltimore Street. This gives some idea of the value of the wider streets in the section along the wharves and docks and in the wholesale district.

During the 18 hours from 6 a.m. to 12 midnight, there were 749,376 persons carried on the various conveyances, as follows:

Kind of Vehicle	Passengers	Per Cent
Street cars	511,389	68.3
Passenger automobiles	209,794	28.0
Buses	16,780	2.2
Taxicabs	11,413	1.5
Total	749,376	100.0

The public transportation facilities, street cars, buses and taxicabs, carried 72 per cent and the automobiles 28 per cent of the passengers. Comparing the number of passengers carried by street cars with the number carried by private automobiles it will be seen that the street cars carried 71 per cent and the private automobiles 29 per cent during the 18-hour period. During the maximum traffic hour of the morning and afternoon rush periods, however, the street cars carried almost 4½ passengers for each passenger carried by automobiles in the direction of heaviest traffic. This is shown by the following summary:

Maximum Hour	Passengers: Street Cars	Passengers: Automobiles	Ratio of Street Ca to Automobile
7 to 8 a.m., inbound	39,631	8,721	4.54
5 to 6 p.m., outbound	55,514	12,509	4.44
Total	95,145	21,230	4.48



Traffic Flow at Intersections in the Central Business District, 12 Noon to 6 P.M. on a Typical Week Day, October and November, 1925

Similar cordon counts have been made in other cities. For comparison the results of these counts are compared with the count in Baltimore:

City and Date	Number of Vehicles	Approximate Area of District, Square Miles
St. Louis (August, 1925)	138,366	0.99
Baltimore (October, 1925)	160,120	0.49
Detroit (June, 1924)	197,967	0.58
Los Angeles (November, 1923)	280,973	0.66

The volume of vehicular traffic at the intersections in the downtown district of Baltimore between 12 noon and 6 p.m. is shown graphically in the diagram on this page. Other charts, not reproduced, show the volume on each street between intersections and similar data for the evening rush hour. It will be observed from the diagram that the traffic at the various intersections throughout this district was very evenly divided with the exception of the intersection along Pratt Street east of Charles, which were the heaviest, and the intersection along St. Paul Street, which were heavier than those along any other north-and-south street. The volume of traffic during the hour from 5 to 6 p.m. shows practically the same conditions, except that the traffic at the intersections along Cathedral Street was much heavier proportionately than during the other five hours of the count.

Checks of pedestrians crossing the intersection of Lexington and Howard Streets and the adjacent blocks show that 50,510 pedestrians crossed the streets and that 21,802, or about 30 per cent of the 73,312 pedestrians observed, crossed the streets adjacent to the

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intersections, between blocks. This argues well for pedestrian traffic control, as jaywalking is one of the chief sources of accidents.

Street Car Speeds Low

Many checks were made of street car speeds. The results are shown in a series of charts included in the appendix of the report. The speeds of cars outside the central district range from 6 m.p.h. to 16.4 m.p.h. The speed in the central business district ranges from 3.4 m.p.h. on Charles Street between Saratoga and Lexington to 12.9 m.p.h. on Calvert Street between Franklin and Mulberry. In general the speed of street cars in Baltimore is slower than that in most large cities. This is due to several factors, chief of which are the narrowness of the streets on which most of the lines are operated and the short distances between some of the stopping places. For the purpose of comparison the schedule speeds of street cars in a number of cities are given in the accompanying table.

SCHEDULE SPEED OF STREET CARS IN VARIOUS AMERICAN CITIES

City	Average Speed, M.P.H.
Baltimore	9.5
Buffalo	10.0
Boston (surface lines only)	10.5
Chicago	11.2
Cincinnati	10.0
Cleveland	10.5
Detroit	10.1
Milwaukee	10.1
Philadelphia (surface lines only)	10.0
Pittsburgh	9.4
San Francisco	10.2
Washington	10.2

In Baltimore the distribution of population is such that the time required for the majority of residents to travel from residence to place of employment or business would be comparatively short if the cars made the speed which it is possible for them to make with safety. Therefore, an increase in the speed made by the street cars must be one of the salient features of any plan to improve transportation service. The "limited stop" service which is recommended in the report, it is stated, will do much to reduce the time spent on street cars. It should also be pointed out that the restriction on the speed of cars while crossing intersections in the downtown district should be made less stringent. A time saving would thus result and the higher speed would be reflected in a somewhat better movement of all classes of traffic.

With regard to the designation of one-way streets, the engineers hold that the possibilities of improving traffic conditions by creating additional one-way streets beyond the four now in use was given careful consideration and it does not appear that any particular improvement could thus be obtained.

Roadway Obstructions

Traffic is impeded and in turn causes congestion at quite a number of points in the downtown district because roadway space which should be used for moving traffic is occupied by traffic semaphores, push carts and temporary huckster and vendor stands. All of these have fulfilled a useful purpose in the past, but the increasing need for more roadway space due to the growth of the city and the constantly increasing vehicular and pedestrian traffic has brought about a condition where the space used by them would be more valuable to the city at large if it were kept free for the purpose for which it was intended. A comparatively small stationary object in a roadway diverts traffic from its course, retards its flow and causes congestion. The congestion is more than proportionately increased when an entire traffic lane, and in some instances two lanes, is obstructed by such objects. Traffic congestion adds to the cost of operating commercial as well as pleasure vehicles and consequently increases the cost of doing business. Therefore all possible measures to prevent it should be taken, and among the first should be the utilization of roadway and sidewalk space for the purpose originally intended, by removing all obstructions to traffic therefrom. Traffic semaphores should be replaced by more modern equipment and if possible other quarters should be provided for push carts and the like. In any event they should not be permitted to utilize roadway or sidewalk space.

Sidewalks in the heart of the retail district are comparatively narrow. This is particularly true of those which carry the greatest volume of pedestrian traffic, namely, along Lexington Street. It is also true of the sidewalks along Charles Street. The complete utilization for pedestrian traffic of some of the sidewalks, narrow as they are, is made impossible by cellar openings, light wells, doorsteps, waste paper boxes and kiosks. The time has arrived when the available sidewalk space in the shopping district is being used at some time of the day up to the limit of its capacity and in some cases pedestrian traffic overflows into the roadway. Three measures can be adopted to meet this situation: (1) Set back the building line; (2) widen the sidewalk by reducing the width of the roadway, and (3) remove all obstructions from the sidewalk and utilize the full width from building line to curb for pedestrian traffic. Of the three, the last is the most practical and can be wholly or partially accomplished with comparatively little expense.

Canvass of Residential Distribution of Workers

It was decided to make a canvass of large groups of persons employed in the downtown district and several of the more important industrial districts so as to determine the modes of transportation used and whether or not the transportation facilities were so located as best to serve those using them. All members of the Baltimore Chamber of Commerce gave full co-operation in making the survey, and 112,642 persons answered a questionnaire.

The means of transportation between residence and business places used by 79,831 persons engaged in the downtown district are shown in the accompanying table:

MEANS OF TRANSPORTATION USED BY 79,831 PERSONS EMPLOYED IN THE DOWNTOWN DISTRICT OF BALTIMORE

	Central Business District		Outer Area		Total Downtown District	
	Persons	Per Cent	Persons	Per Cent	Persons	Per Cent
Street cars	50,012	79.5	11,895	70.2	61,907	77.5
Buses	1,816	2.9	165	1.0	1,981	2.5
Total	51,828	82.4	12,060	71.2	63,888	80.0
Steam and interurban railroads	595	1.0	181	1.1	776	1.0
Total	52,423	83.4	12,241	72.3	64,664	81.0
Passenger autos	5,478	8.7	1,317	7.8	6,795	8.5
Walkers	4,991	79.9	3,381	19.9	8,372	10.5
Grand total	62,892	100.0	16,939	100.0	79,831	100.0

The outstanding fact shown by the table is that over four-fifths (81 per cent) of the persons canvassed used the collective transportation agencies. Those using

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automobiles and taxicabs amounted to 8.5 per cent of the total and 10.5 per cent walked. In the outer area, the proportion of walkers is 2½ times that in the central business district. This is due to the close proximity of residences to the outer edge of the downtown district.

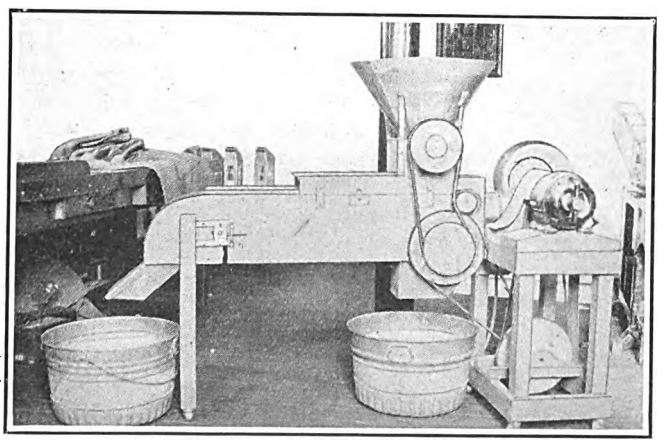
The same information is presented graphically in the set of maps of the city, with dots representing the distribution of the workers. The comparatively small numbers using individual means of transportation are quite evident.

Similar data were collected for seven principal industrial districts. In general the same conditions hold as in the central district. Out of a total of 31,034 persons counted 16,966 or 54.7 per cent used street cars; 389 or 1.2 per cent used buses; 32 or 0.1 per cent traveled by railroad; 2,264 or 7.3 per cent used automobiles, and 11,382 or 36.7 per cent were walkers. It was also found that there is to a great extent an avoidance of superimposing the rush hour traffic of the outer industrial districts on that of the central business district. Of the 31,034 persons canvassed in the seven industrial districts only 8,000 or about 25 per cent are required to travel through the central district on street cars in going to and from work.

In the second article, to appear in a subsequent issue, the car routing and plans for betterment of traffic through improved control and a major traffic street plan will be discussed.

Time for Ticket Sorting Reduced 50 per Cent

SEPARATING of tickets from coins as they are received from fare boxes is a considerable problem on most electric railways. In Erie, Pa., a shop constructed blower device has reduced the time of sorting 50 per cent. Tickets and coins as they come from the fare box are placed in the hopper of the machine



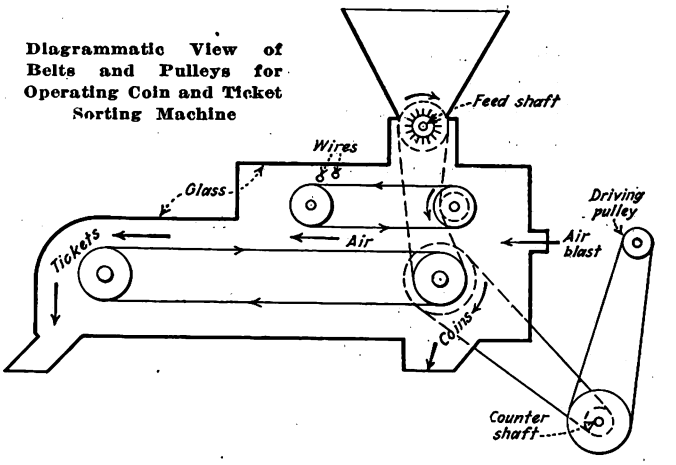
Ticket and Coin Sorting Machine Used by the Erie Railways

and a feeder shaft delivers them on top of a belt. As they drop from this belt to a lower one a blast of air blows the tickets out the far end of the machine, while the coins remain on the belt and drop down into a chute, which delivers them through an opening at the opposite end of the machine. The accompanying halftone shows the construction of the machine and the line diagram gives an idea as to its operation.

A blower from a Peter Smith heater is used to supply the air. It is driven by a ¼-hp. motor. The motor shaft is also provided with a pulley which is belted to a countershaft directly underneath. From this countershaft a belt leads to the driving shaft of the lower coin belt, and another pulley on this shaft is connected to the feeder shaft. A pulley on the top coin belt shaft rests against this connecting belt and so is driven from it.

The hopper is 18 in. diameter at the top and slopes to 6 in. diameter at the bottom. The feeder shaft passes through the bottom of the hopper and is pro-

Diagrammatic View of Belts and Pulleys for Operating Coin and Ticket Sorting Machine



vided with teeth which are welded onto the shaft in eight rows. The center teeth project 2½ in. above the shaft and these slope toward the edge so as to conform to the curvature of the opening at the bottom of the hopper.

In order to prevent coins and tickets from becoming lodged at the sides of the belt, wooden blocks overlap the belt for a space of ¾ in. on each side. There are also two cross wires provided a short distance from the bottom of a hopper, which, passing across the upper feeding belt, prevent coins from rolling and insure that they lie flat on the upper belt. Otherwise, it was found that the rolling coins might continue to roll along the lower belt and so pass out of the opening intended only for the tickets. To enable the operator to see what is happening inside and also for convenience of cleaning the machine, glass slides are fitted to the top of the machine through which the coins pass.

In operation, the coins and tickets as they are fed from the hoppers are deposited on the top belt, which is 13 in. from the center of the hopper to the extreme end. The blast of air from the blower passes between the surfaces of the two belts and the tickets are blown out as they drop from the top to the lower belt, while the coins drop down to the lower belt, the top of which is 6 in. below the upper one. This lower belt passes over pulleys which have centers 27 in. apart, and its top travels in the reverse direction from that of the shorter belt. Coins as they drop from the upper to the lower belt are thus conducted back to the starting end of the machine and pass out an opening and fall into a basket underneath placed to receive the coins. The tickets, on the other hand, are blown out at an opening the opposite end of the machine and pass into a similar basket arranged underneath the opening at that end. The upper belt is made of canvas, since it is take-up bearing is provided at the far end of the lower belt to make certain this is kept tight should stretching of short length, while the lower belt is of leather. A occur. Standard Ford generator ball bearings are used throughout for all rotating parts.

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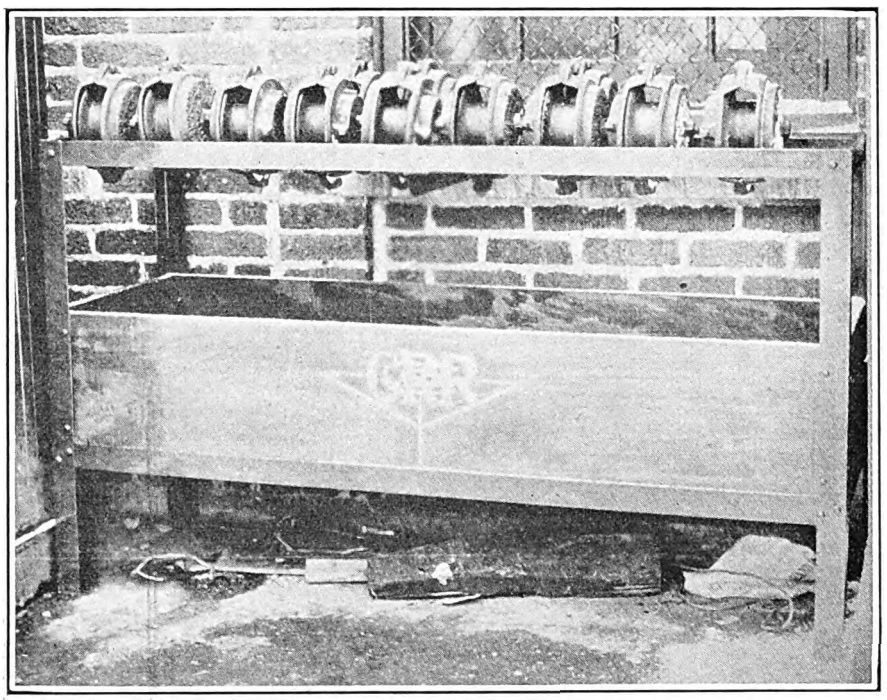
Maintenance Notes

Convenient Rack for Trolley Catchers

ORDERLY arrangement for the storage of trolley catchers being desirable, the Grand Rapids Railway, Grand Rapids, Mich., has provided each of its operating carhouses with

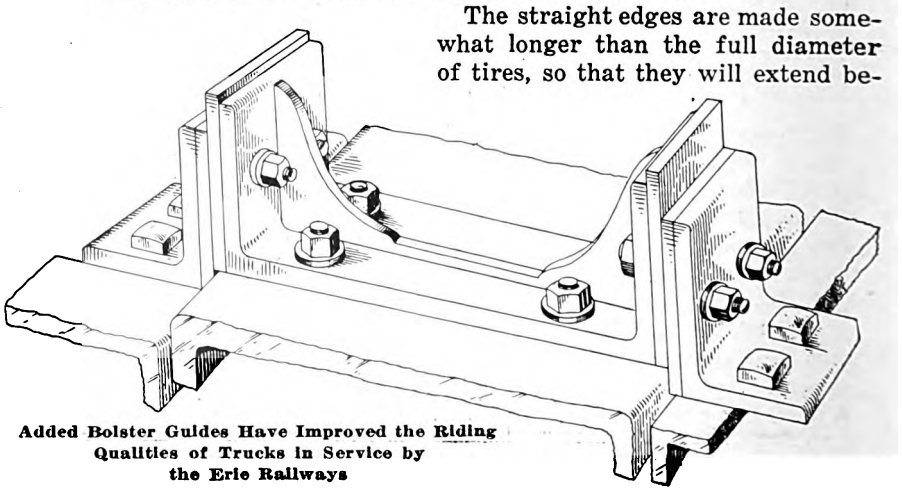


Racks Are Provided at Each of the Carhouses of the Grand Rapids Railway for Storage of Trolley Catchers

a rack to hold the trolley catchers when they are not in service. This rack is made of 2 x 2 x ⅛-in. steel angles. It has provision at the top for holding trolley catchers which are O. K. for service. A bin is installed at the bottom, in which bad order catchers are placed. These are removed from the cars and sent to the shop for repairs daily, being replaced by catchers in good condition.

Added Bolster Guides Improve Car Riding

WHEN a car stops there is a tendency for the truck bolster to tip forward. Likewise, when the car starts, due to the acceleration of the motors, the tendency is for the bolster to tip backward. Bolster guides are therefore subjected to a considerable strain which causes wear at each stopping and starting of the car. In order to provide additional bolster guide surface and to damp out the rocking tendency of truck bolsters, P. J. Wood, superintendent of equipment, Erie Railways, Erie, Pa., is adding two angle plates to the truck transom with two corresponding angle plates on the truck bolster at each side of the truck. These extend upward for a distance of 6 in. and are 8 in. wide. Hardened steel wearing plates are bolted to the faces of each of these angle supports and a clearance of 0.020 in. is allowed between the faces of the wearing plates coming together from the truck transom and bolster. The accompanying illustration shows the installation of these additional bolster guides on a Baldwin No. 77-18 K truck. Their use has produced a great improvement in the riding qualities of the truck and also prevents the tendency of other truck bolts to work loose.



Added Bolster Guides Have Improved the Riding Qualities of Trucks in Service by the Erie Railways

Gage Checks Alignment of Bus Wheels

By F. J. Foote
Superintendent Motive Power and Equipment Columbus-Dayton Transportation Company, Springfield, Ohio

SAFETY and economy are never best served by tires that are improperly aligned. This is so by reason of the facts that difficult steering, an enemy to safety, and rapid tire wear, an enemy to economy, are caused by wheels that have too little or too much "toe-in." After trying many methods for determining wheel alignment, a gage was finally evolved in our shops that has proved satisfactory because of the accuracy and speed with which it can be used on certain models where ordinary gages cannot be used.

The principle used is that of the parallel ruler, which depends on the theorem that opposite sides of a parallelogram are always parallel. The gage consists of two thin hardwood straight edges connected at equidistant points with two links of equal length. If this device is accurately made the outer edges when parallel in any one position will be parallel in any other.

The straight edges are made somewhat longer than the full diameter of tires, so that they will extend be-

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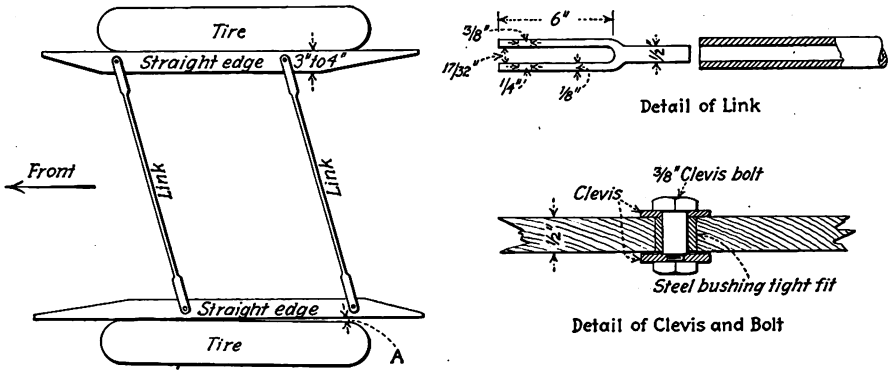


Wheel-Aligning Gage. Necessary "Toe-in" Is Indicated at *A* in Assembly Diagram. Link Is Composed of Two Clevises and Section of Pipe Riveted and Welded Together

yond the tires both ways. To use this gage one straight edge is held firmly against one tire as high up from the floor as possible (or against the rim if same projects beyond the tire), then the other straight edge is carefully moved out against the opposite tire (or rim). Unless the tires happen to be parallel this edge will touch the tire at one point only, while the other end of the straight edge will stand away from the tire a certain amount. As this measurement must necessarily be made at points below the wheel center, the amount that the straight edge stands away from the tire will be less than the amount of the toe-in. This is so because of the camber or "dish" of the wheels.

It has been found that the best method is to determine with as much accuracy as possible just what toe-in gives the best results, then select a bus whose wheels have the exact toe-in required, apply the parallel gage to the wheels, noting down the amount that the straight edge stands away from the tire at one side. This need be done only once, as the setting will then be the same for all time unless it is desired to change the size of tires or the toe-in.

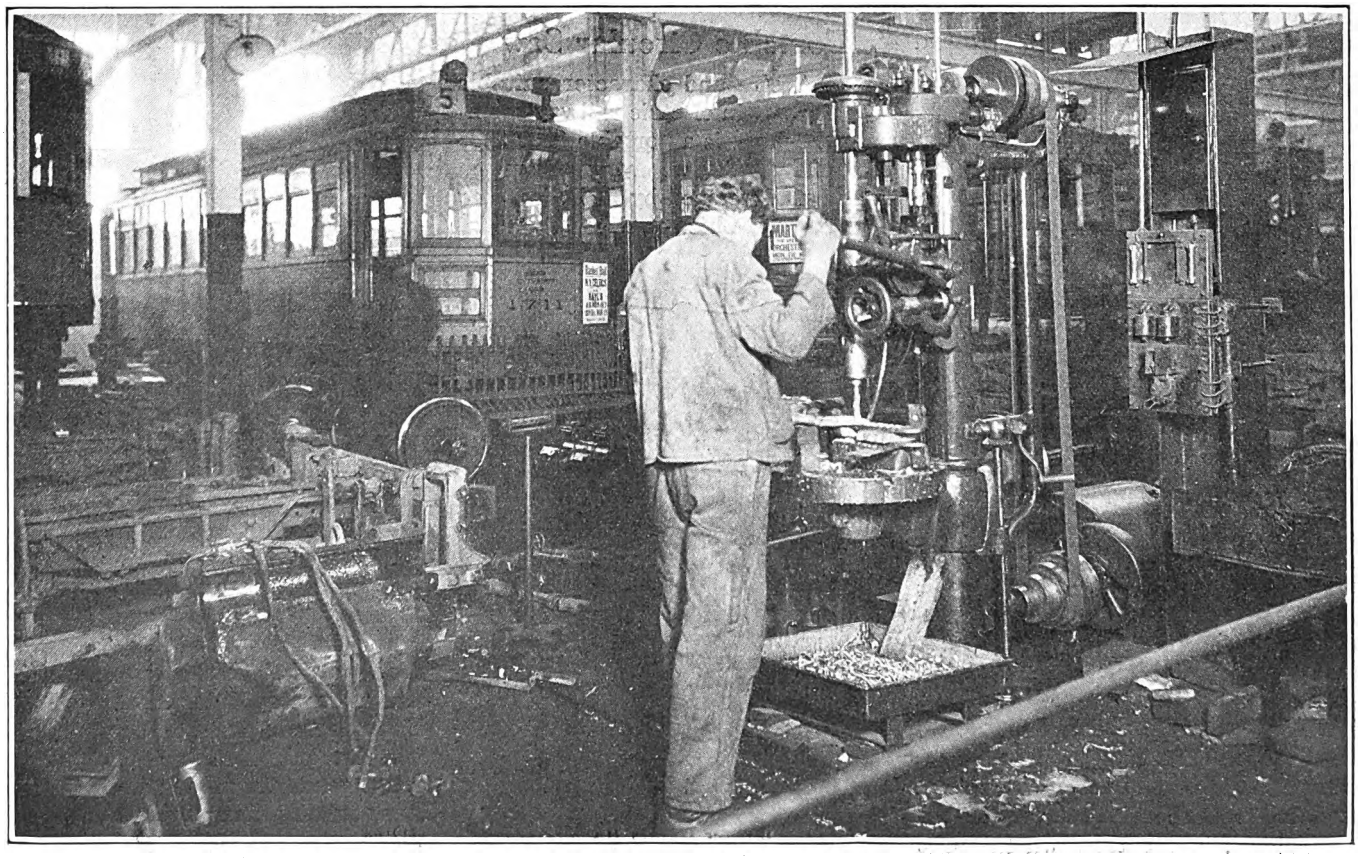
After this gage is used a few times the mechanics will be able to judge the required opening between straight edge and tire by eye with sufficient accuracy so that a scale or other measuring device is unnecessary. In practical use it is always advisable to apply the gage in at least two or preferably three places around the tires, taking as the proper "toe-in" an average of the readings obtained to compensate for wheels or tires that do not run true.

This should be done with the full weight of the bus on the tires, and it is preferable to move the bus forward a short distance before each measurement in order to take the slack out of tie rod joints and other parts. Any good mechanic can build the gage, but great care should be exercised to get the bolt holes in the straight edges the same distance apart and the same distance from the working edges, also to get the bolt holes in the links the same distance apart. The bolts should be lathe turned with a very close fit in both links and straight edges so that there will be no lost motion.

As a final check for accuracy one straight edge should be placed on a level floor, the links held stationary in a nearly vertical position and the straight edges carefully checked for parallelism.

Drill Press Convenient for Truck Overhauling

DRILLING and grinding of various truck parts have been facilitated by a modern high-speed drill press and an emery wheel which have been installed in the truck overhauling shop of the Department of Street Railways, Detroit, Mich. This has been found of particular benefit



Drilling a Truck Hanger in the Overhauling Shops of the Department of Street Railways, Detroit

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in saving workman's time, as otherwise the parts would need to be taken to the machine shop. Often the workman can finish the job completely in much less time than would be needed to have the parts carried to and returned from the machines in the machine shop.

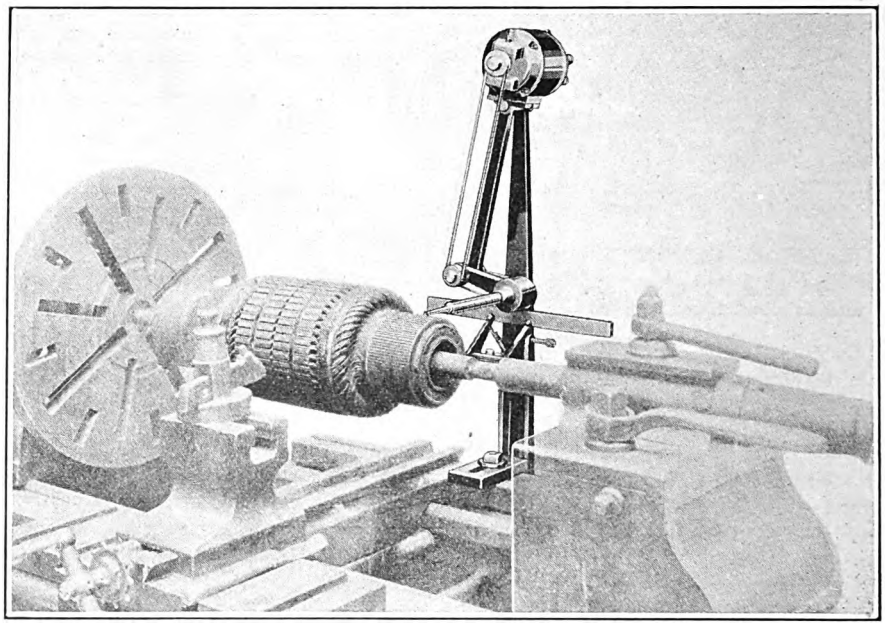
New Equipment Available

Commutator Slotting Attachment for Any Lathe

ONE of several types of commutator slotting devices recently put on the market by the Hullhorst Micro Tool Company, Toledo, Ohio, is a lathe type of particular interest to electric railway men. This is designed for attachment on any make of large lathe, and its simplicity of operation enables work of undercutting commutator mica to be done speedily and with ease. This particular type of machine, known as No. 9, is mounted on the lathe by attaching the slotted angle plate at the bottom to the lathe carriage. The main upright, which supports the mechanism, is held to this angle plate by two cap screws. Rough adjustment up and down to suit varying diameters of commutators is obtained by sliding the upright with the cap screws loosened.

For accurate adjustment of the depth to which slotting is to be done, a depth bar gage fits to the upright. The lower arm of the undercutter slides on this depth gage, which serves as a rest to insure accurate work. The slotting saw or cutter is driven by a small motor through belting. Motors are furnished for operation on either a.c., 60-cycle, 110-volt circuits or for d.c., 110-volt circuits. The motor is pivoted at the top of one swinging arm, and a pulley on the armature shaft provides for belting to a countershaft and from this to a pulley on the cutter spindle.

The cutter spindle is built into the lower arm of the machine. It has a tapering arbor $\frac{3}{8}$ in. diameter at the cutter end. The spindle and arbor are made of crucible steel lapped into bronze bearings. The disk mica cutter is placed on a screw at the end of the arbor. It is a mill-cut precision made cutter, which mills



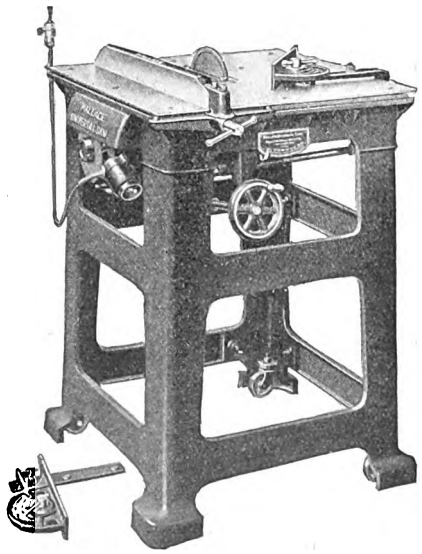
Slotting an Armature by Means of the Undercutting Machine Attached to a Lathe Carriage

out a clean smooth groove of uniform depth.

In operation, the workman sets the cutter over the mica at the back end of the commutator and then pulls the handle toward him. Very little pressure is needed for cutting. When not in use, the swinging arms can be pushed up and the construction is such that they remain in the upward position out of the way, so that the lathe can be used for other work.

Portable Circular Saw

OF A size and character suitable for use in electric railway maintenance shops is a portable floor type circular saw for woodworking which has been developed by J. D. Wallace & Company, Chicago, Ill. It may be expected to relieve larger machines of considerable work so that both types can be operated to full capacity on the work for which they are best adapted.



New Circular Saw Suitable for Railway Use

The motor and all working parts are built into the upper portion with the table and fences. Thus the top part is a complete self-contained bench type saw when lifted off the regular stand. A constant-speed air-cooled motor is directly geared to the saw spindle, thus eliminating all belts and their attendant troubles. The electric motor operates on either the lighting or the power circuit. It is started and stopped by means of a toggle switch located on the motor itself.

A table of one-piece finished steel 25 in. x 25 in. and fitted with a removable throat piece is provided, so that special saws, dado and cope heads requiring a wider throat opening may be used. The machine is designed to handle the smallest and most delicate work with absolute accuracy and yet is sufficiently rugged to cut efficiently stock $2\frac{1}{2}$ in. in thickness.

To cut various angles the saw is tilted instead of the table and it is possible to cut at any angle up to 45 deg. with either ripping or cross-cutting saws by this tipping of the blade. Two cross-cut fences are provided so that right or left hand mitring up to 50 deg. can be done, the angle being indicated on a degree plate located on each fence. Provision is made for taking up any play, thus assuring accuracy. Both fences can be removed when not in use.

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Association News & Discussions

Control of Inventories*

By W. F. MAHER
Storekeeper United Electric Railways

FUNDAMENTAL principles of storekeeping require the keeping of records in two forms, namely, the control account and the unit record. The control account, known as general stores, material and supplies or some such term, simply reflects the aggregated valuation of material on hand at the closing of each accounting period. The unit, or individual card record, shows the quantity and value of each item, constituting the basis of perpetual inventory. While both the control account and individual record are essential, they do not provide a means of quick analysis when there is a substantial fluctuation of the inventory, an increase in inventory always being disturbing from a storekeeping standpoint unless there is a known reason for such increase.

To determine the cause of fluctuations and to maintain a better control of the inventory on account of the vast sum of money represented, it is necessary to equip the stores system of accounting with controllers, slack adjusters, shock absorbers and other protective devices as follows:

1. An annual physical inventory is taken.
2. A card is kept in each bin or location showing receipts, delivery and current balance.
3. A stock record card is kept showing on one side complete data embracing requisition number and date, order number and date, quantity ordered, received and billed, amount of invoice, unit cost and firm from which purchase was made, monthly disbursement and annual inventory. The reverse side provides for disbursement showing date of issues, department furnished, quantity and perpetual balance.
4. A maximum and minimum quantity is established, where practicable, which provides for unit control.
5. An actual count, where practicable, is made at each turnover before new stock is stored, at which time bin cards and stock records are checked and adjusted. With this method several physical inventories are obtained during the year.
6. A subdivision of stores by means of a logical grouping of material by classes.

When we arranged our classification of material we endeavored, where possible, to group in a class by itself material that in the ordinary course of events would be used by one department and chargeable to one operating account. This reasoning, of course, could not be applied to all material, as items such as bolts, nuts, screws, washers, etc., are used by all departments and chargeable to sundry operating accounts, so to cover these miscellaneous items a general division was incorporated. The classification consists of 42 classes divided into the following major divisions: (1) track; (2) line; (3) structures; (4) equipment; (5) power; (6) general; (7) scrap; (8) containers.

Receipts and disbursements are posted to the various classes: classes are balanced, and a stock report forwarded to the vice-president each month showing a summary of activities in each class for the month. A fluctuation in the inventory can be readily ascertained by an analysis of the various classes, and if fluctuation is due to seasonal requirements it will be evidenced in the classes affected.

The reduction of the inventory, of course, is to a large extent dependent upon the control we have of the inventory, one being very closely related to the other. In order to facilitate the reduction of our inventory by reducing our obsolete and slow moving stock, we have set up another classification which is used when the annual physical inventory is taken and material inventoried under the following captions: Class A—New material; Class B—New material, obsolete; Class C—New material, inactive; Class D—Partly worn material; Class E—Scrap. In this manner we gather under one head all new, but obsolete material. Under another, our inactive or slow moving items. We endeavor by letter to heads of departments and by personal interview to ascertain if this material cannot be used or substituted for material which would otherwise have to be purchased and representing an additional investment. If we find that there is no place on our property where this material can be used, a report is sent to the vice-president setting forth the name of the material and book valuation and he in turn refers the matter to the purchasing agent, who endeavors to find an outside market for such material. If there is no market for this material it is then scrapped, metals salvaged and sold under the competitive bid system.

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 10-11—Advisory Council conference electric railway executives, Eastern region, starting 3 p.m. June 10, Engineering Societies Building, 29 West 39th Street, New York City.

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Quantity Buying for Small Railways*

By A. B. FULLER
Purchasing Agent Union Street Railway, New Bedford, Mass.

QUANTITY or seasonal buying is undoubtedly practical on large properties where the turnover is rapid and large quantities of material are used, but in the case of small companies the financial saving is offset by two factors which must be considered, namely, depreciation of material and too long a tie-up of money. In general, small roads would do better to follow the hand-to-mouth policy.

The buyer is frequently offered opportunities to order supplies which will be delivered at hand-to-mouth intervals and invoiced accordingly and still take advantage of quantity prices. However, unless he is buying on a very large scale, the saving is insufficient to counteract the cost of the clerical work involved in taking care of the several contracts.

With stock now being carried almost at our door by the large supply houses and manufacturers, who are constantly striving to give better service, it seems no longer necessary to anticipate our standard material requirements two or three months in advance. The burden of carrying large stocks has been assumed by them and has made possible a great saving in interest on money which would otherwise be invested in supplies. For instance, we no longer find it necessary to buy our entire winter's supply of armature coils in the fall.

It is the policy of our company to take advantage of all discounts, both in buying and discounting of bills. The

*Abstract of a paper presented at a meeting of the New England Street Railway Club, Boston, Mass., May 6, 1926.

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only disadvantage in this practice is that goods are very frequently paid for before they have been delivered, and if they are not satisfactory it is harder to adjust the matter than if the invoices had not been paid prior to the arrival of the goods.

Quotations are requested by us on purchases involving large amounts. No definite policy is followed in awarding contracts, but they are usually awarded in accordance with the best judgment of the purchasing agent, quality usually being of the greatest importance.

It seems to me that in the case of small roads, having no adequate testing facilities or no means of getting our specifications, it is much better to rely upon the manufacturer, who, it is safe to assume, knows more about the article he is producing than the buyer, whose only guide must be the manner in which the material fills his requirements.

We have found that, with our limited facilities and comparatively small requirements, goods can be purchased more cheaply than we can manufacture them. We confine our efforts in this direction to reclamation work and some small amount of manufacturing which is done in spare time.

	Material on Hand	Gross Earnings	Per Cent Ratio
1920.....	$83,998.68	$1,724,902.98	4.8
1921.....	69,907.41	1,600,018.55	4.3
1922.....	52,491.40	1,606,395.66	4.2
1923.....	57,730.46	1,634,286.60	3.5
1924.....	46,355.91	1,458,888.05	3.1
1925.....	46,071.10	1,422,630.71	3.2

We are fortunate in having our stock practically all under one roof and under the constant supervision of only two men. This has a tendency to keep the amount of supplies down to the minimum requirement, which eliminates the waste and unnecessary accumulation which is likely to occur on large properties, where the supplies are distributed over a large territory and they must be handled by a large number of men.

During the last six years we have reduced the amount of money invested in supplies about 40 per cent by means of these practices. An additional reduction has also been effected by immediately disposing of any obsolete material discovered in stock instead of carrying it from year to year, thinking we may use it some day, or depending upon inventory to bring it to light. In the rush of stock taking it is very likely to be overlooked.

The accompanying table shows the comparative ratio of supplies on hand to gross earnings of the Union Street Railway for a period of six years.

Central Electric Railway Master Mechanics Meet

FIFTY-ONE delegates attended the quarterly meeting of the Central Electric Railway Master Mechanics' Association which was held in Decatur, Ill., on May 13. E. B. Gunn, Wapakoneta, Ohio, superintendent of equipment for the Western Ohio Railway, presided in the absence of Pierre V. C. See, who was kept away from the meeting by strike conditions in Akron, Ohio.

J. D. Barnhart, superintendent of shops, Illinois Traction System, Decatur, entertained the delegates at a luncheon at the Hotel Orlando, and later the guests made a trip in the new buses of the Illinois Power & Light Corporation through the territory. The ride was arranged by courtesy of M. L. Harry, general manager of the corporation for the Decatur territory.

Interesting talks were made by J. S. Y. Frelich, district manager of the Westinghouse Traction Brake Company, on "Maintenance and Safety Features of Air Brakes," and by J. D. Barnhart, who opened a round-table discussion on public safety methods. The discussion on this latter subject brought out opinions that the electric railways are rapidly recovering from the temporary slump and are successfully combating the effect of the introduction of the automobile into the transportation field. E. J. Hoefler, technical representative of the Sherwin-Williams Paint Company, Cleveland, Ohio, discussed paints and lacquer systems.

The various representations from the different states were: Illinois, 24; Ohio, 13; Indiana, 10; Missouri, 2; Pennsylvania, 1, and Michigan, 1.

Standard Track Bolts and Nuts Proposed

PREPARATION of tentative standards for track bolts and nuts have recently been completed by sub-committee No. 4 of the sectional committee on standardization of bolts, nuts and rivet proportions of the American Engineering Standards Committee. These tentative standards are now being submitted to the sectional committee for discussion and approval, after which they will be sent to the sponsor bodies for their approval. The prepared standards are thus only in tentative form and are open for discussion and criticism by electric railways. Those interested in the new standard can obtain copies by addressing C. B. Le Page, assistant secretary American Society of Mechanical Engineers, 29 West 39th Street, New York, N. Y.

The sectional committee which is dealing with the standardization of bolts, nuts and rivet proportions consists of 49 men, representing twenty national organizations, among which is the American Electric Railway Engineering Association. The committee was organized in March, 1922, by the Society of Automotive Engineers and the American Society of Mechanical Engineers acting as joint sponsors, under the procedure of the American Engineering Standards Committee. Subcommittee No. 4, which has compiled the standard, includes representatives from the largest steam railroads in the United States, electric railways and the leading manufacturers of track bolts and nuts. Clarence W. Squier, associate editor ELECTRIC RAILWAY JOURNAL, represented the American Electric Railway Engineering Association and served as chairman of the sub-committee.

Two types of track bolts are submitted. These differ only in the shape of the neck, one neck being oval, while the other is elliptic. Nominal diameters over threads have been standardized so as to increase in steps of $\frac{1}{16}$ in. from $\frac{1}{2}$ to $1\frac{1}{4}$ in. A large majority of the railways and railroads now use the oval neck type, but a few of the larger systems have gone to the elliptic neck as it offers certain advantages in preventing turning of the bolts. Where a change from present types of bolts used by electric railways is necessary in order to comply with the new standard, it is considered advantageous to use the elliptic neck bolts.

The proposed standards for track bolt nuts include three types, square, hexagonal and the Ideal recessed. Dimensions are also standardized for common and treated nuts. The track bolts and nuts have either the American National Standard form or Harvey grip threads. They may be formed by cutting, drawing or rolling.

Buses Will Conserve Rail Investment, Says Reeves

DECLARING that the steam railroads and electric railways had always arisen to the occasion in providing transportation service demanded by the public, Alfred Reeves, general manager National Automobile Chamber of Commerce, in an address before the New York Electrical League luncheon, held at the Hotel Astor, April 29, gave it as his opinion that the transportation interests would take up bus operation with increasing enthusiasm.

"It is true," he said, "that the electric railways were far too late entering the bus field, just as some of the railroads have been slow in entering the truck field. However, I think we ought to consider that it is hard to get men to take up hurriedly any new form of transportation. I have the feeling that mass transportation in the big cities will be moved by trolleys and subways, but that those trolleys and subways can supplement their service by buses, and that in many cases it will be cheaper to install buses in new territories and in some places have them replace some of the non-paying trolley lines."

Mr. Reeves declared that while he had a profound respect for any statement made by L. F. Loree, president of the Delaware & Hudson Railroad, he could not wholly agree with the statement made by Mr. Loree in his address to the St. Louis Chamber of Commerce recently, when he expressed the opinion that the country could wipe off the books the $6,000,000,000 invested in electric street and interurban railroads because the automobile bus and truck had placed them in the discard as effectively as steam railroads had killed the stagecoach during the last century. "Studies carried on by the National Automobile Chamber of Commerce," he said, "have brought no such conclusion."

"Unfortunately," Mr. Reeves declared, "too many of the trolley and railroad men have adopted buses and trucks in self-defense, rather than with enthusiasm. Many even now would apparently be glad to see this development cut off by drastic legislation. To many of them this form of transportation is a stepchild and they are more interested in its death than in its development. Not all trolley or railway men have taken this attitude, however. We are, of course,

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in favor of proper regulation of buses and trucks. We advocate limited weights and limited sizes, but naturally we oppose, as any would oppose who are interested in transportation, the passing of legislation that would have to throttle rather than encourage such form of service to the public. Public opinion, which is the final arbiter after all, will demand buses and trucks."

Co-operative Colleges to Convene in Cincinnati

COLLEGES and universities giving co-operative instruction in engineering, commerce, architecture and other subjects have formed an association to further this form of education. The association will hold its first annual meeting at the University of Cincinnati on June 14-15. It was here the co-operative system was originated by Dean Herman Schneider twenty years ago.

Under the co-operative plan the students spend alternate periods at the university and at work in industry. While one student is in school his alternate is receiving practical training in some factory or office, and vice versa. In this way both the school and the shop are always fully manned. The theory learned in the classroom is thus applied in industry, and the problems which arise in industry are brought to the classroom.

Practically all types of manufacturing and construction enterprises have been used successfully in the training of co-operative students during their outside work period. Transportation and commercial organizations have proved equally useful for the same purpose, and, more recently, co-operative relations have been established between the colleges and those industries in which art is a factor, such as jewelry, ceramic and textile works.

The students profit by an opportunity to study technical problems at first hand and by access to the best modern equipment. The firms have the benefit of the enthusiasm and the analytical point of view brought into their organizations by student employees who are frequently able to contribute more than the satisfactory completion of the day's work.

International Conference at Barcelona, Oct. 10-16

DATES for the next convention of the Union Internationale de Tramways de Chemins de fer d'Intéret Local et de Transports Publics Automobiles have been definitely fixed for Oct. 10-16, 1926. It will be held in Barcelona, Spain.

The program of the convention was published in ELECTRIC RAILWAY JOURNAL, Jan. 23, 1926, page 161.

Internationaler Verein Selects Copenhagen for 1927

COPENHAGEN will have the next convention of the Internationaler Strassenbahn und Kleinbahnverein, to be held in June, 1927. An invitation to meet in Copenhagen has been received from the authorities of that city and has been accepted. The last meeting of the association was in Budapest in 1925.

American Association News

American Executive Committee Meeting

Progress Reported on Convention Plans—Large Street Car Exhibit Expected—Special Car Report Completed—Second Advisory Council Conference Announced

PROGRESS in the work of various committees was reported to the executive committee of the American Association at a meeting held at association headquarters on May 14. Publicity activity, national relations, plans for the coming Cleveland convention and the work of affiliated associations occupied attention during a busy morning session.

Under the heading of publicity, J. W. Welsh, executive secretary of the association, who outlined the work of the committee, reported that 70,000 booklets covering the Indiana and New York bus situation had been distributed throughout the country. In addition, more than 25,000 booklets containing the "daily dozen" recommended by Mr. Storrs and the address of Britton I. Budd delivered at the Indianapolis meeting of the Central Electric Railway Association have been distributed.

Increase in company membership from 736 to 741 was reported by J. H. Hanna, chairman of the membership committee. There also was an increase in individual membership from 1,022 to 1,060. This, according to report, represents a total increase of 204 individual members since last October. C. E. Morgan called attention to the reorganization of the Public Service Railway company section, which recently held a meeting at which approximately 200 were present.

PLANS FOR CLEVELAND CONVENTION

Progress on plans for the Cleveland convention was outlined by J. H. Alexander and F. C. J. Dell. At a meeting held in Cleveland a sub-committee of the exhibit committee approved a space diagram for the exhibit, which is being prepared for printing and distribution to the industry. The Cleveland convention committee held its first meeting recently and approved a form of contract with the association with some slight modifications. A special subcommittee consisting of C. E. Morgan, B. A. Hegeman, Jr., and C. R. Ellicott was appointed by President Coates with power to act on the contract before the next executive committee meeting. Tentative commitments for approximately 40 street car exhibits were reported. Plans are being made to intensively circulate the industry for the purpose of stimulating car exhibits during the convention. The matter of throwing the exhibition open to the public on one night during convention week was left in the hands of the Cleveland convention committee, together with the question of charging an admission fee for such public attendance. Tentative arrangements have been made with the Cleveland Orchestra to have it available for Tuesday night during the Advisory Council meeting if that plan fits in with the general convention program.

Friday afternoon and Saturday morning were designated by the executive committee as the proper time for visiting manufacturing plants in and around Cleveland. This plan was adopted in order to avoid having such inspection trips interfere with the program of the convention.

M. B. Lambert, Mr. Storrs and President Coates reported on the recent meeting of the U. S. Chamber of Commerce at Washington. Mr. Lambert pointed out that the Chamber of Commerce is becoming a leading spirit in guiding the destinies of American industry, and emphasized the importance of the chamber's work. He urged that railway executives become active in the chambers of commerce in their respective cities.

On the subject of national relations, C. L. Henry said that electric railways have been definitely exempted from the provisions of the railroad labor bill. He also said that according to the latest information available there has been no general hearing called on the question of the application of section 15a to electric railways, although a specific hearing in the case of the Interstate Public Service Company of Indiana has been set for May 25.

TO DESIGN ASSOCIATION FLAG

T. W. Casey, C. C. Peirce and H. C. Clark were designated as members of a special committee appointed to design an association flag. C. R. Ellicott was authorized to arrange for a special association booth in the convention hall for the sale of canes with an appropriate A.E.R.A. ribbon attached. A special donation of $1,000 to the American Engineering Standards Committee was approved. This is in addition to the regular dues, amounting to $1,000 annually, paid by the association.

An outline of the progress of work in the Engineering Association was given by C. R. Harte, president. This included work by the purchasing agents and storekeepers on the establishment of an obsolete material exchange. He secured authorization for the committee to send out a special questionnaire to obtain the sentiment of the industry regarding the establishment of such an exchange. Mr. Harte expressed the belief that the new procedure of approving standards by letter ballot would help to eliminate the tendency toward perfunctory approval and subsequent failure on the part of member companies to adhere to standards adopted. He emphasized the importance of the co-operative work done through the American Engineering Standards Committee.

The committee approved general let-

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ters to be sent out by the association giving the conditions of a speed contest and public relations contest under the auspices of *Electric Traction* and *Forbes Magazine*, respectively.

J. H. Hanna reported the consummation of arrangements with L. R. Nash to take over the work on depreciation formerly handled by Mr. Maltbie. E. F. Wickwire, speaking on the program of the committee on co-operation with manufacturers, said that the committee had decided to make its principal work for the present that of furthering interest in traffic congestion relief. Arrangements have been made to print the address of President Coates at the United States Chamber of Commerce meeting for distribution to all manufacturing members of the association.

Edward Dana, chairman of the committee on education, said that his committee is co-operating with the committee on management and operation. Arrangements are being made to hold a typical foreman conference during the Cleveland convention. Two men from each of seven widely distributed companies will take part.

Report on Improving Cars Completed

For the committee on management and operation, G. C. Hecker of the association staff reported general activity and announced that approximately 900 copies of the book on modern methods and practices had been sold. Mr. Hecker also reported completion of its report by the special manufacturers' engineering committee which has been studying the question of improving car design and reducing the number of types of cars which are required by the industry. This report was turned over to Mr. Storrs pending appointment of a committee of manufacturers' executives to take charge of various phases of a general campaign looking to the improvement of electric railway rolling stock. In a brief abstract of its work the committee indicated that it had made a study of various recent car types submitted by manufacturers, and had reached the conclusion that the large variety of designs required in the past has prevented manufacturing economies from being accomplished. It was the opinion of the committee that agreement on the basic features of design would permit approach by manufacturers to a quantity production basis through elimination of needless variations in dimensions, weight and general arrangement.

As a basis for agreement on fundamental features the committee submitted plans of a city and an interurban car. These are intended to show that cars of the general types indicated may be adapted to meet conditions on various properties. Either car may be arranged for one-man, two-man or combination one-man two-man operation. The designs are also adaptable for single or double-end service and for various seating capacities. It was the intention of the committee to provide for increased size by lengthening the body in window sections. Only three standard sized motors, namely, 25, 35 and 40 hp., are considered necessary under average conditions. Twenty-six-inch diameter wheels were recommended.

It was pointed out that the designs submitted may be equipped with any known specialty or safety devices and that in adhering to the recommendations, manufacturers are in no way limited in developing a distinctive product; that ingenuity may be fully exercised in the design of structural details to reduce weight and that features to add comfort and attractiveness to passengers are optional with the individual builders. The committee recommended prompt publication and distribution of the report. It also urged that a referendum of the industry on the proposed cars be made to give a definite idea of the extent to which the recommendations may be made effective on various properties.

Modern Cars Earn 13 To 65 per Cent

Part 2 of the report contains experience data on eight properties where modern light-weight cars have been installed. Returns on the investment based on savings in equipment maintenance, power and platform labor range from 13 to 65 per cent. Some properties also showed a gratifying gain in gross revenue, indicating that attractive new cars are important factors in stimulating traffic. A bibliography of articles appearing in the technical press on advantages of new cars is included in the report. In Part III interesting data concerning the purchase of cars since 1907 and a summarized statement of the age of equipment in service by five-year periods as compiled by ELECTRIC RAILWAY JOURNAL is presented. From an analysis of these figures the committee concludes that there are 25,000 cars in the industry that are more than twenty years old.

A nominating committee for the officers of the association and five directors—two railway and three manufacturers—was named by President Coates and approved by the executive committee pending acceptance. A resolution on the death of Randall Morgan prepared by a special committee, of which Mr. Shannahan was chairman, was read by Mr. Welsh.

Regional Conference Announced

Mr. Storrs announced a regional conference under the auspices of the Advisory Council for the Eastern territory, similar to that held in Chicago. This meeting will be at the Engineering Societies Building in New York City on June 10 and 11.

An invitation from Barron Collier to hold the next executive committee meeting on board his yacht on the Hudson was accepted. The yacht will leave the dock at 79th Street and the Hudson River promptly at 10 a.m. daylight saving time on July 30.

Those present at the meeting were as follows: F. R. Coates, R. P. Stevens, Barron Collier. L. S. Storrs, C. R. Harte, J. H. Hanna, H. B. Flowers, E. F. Wickwire, W. S. Hammond representing C. S. Hawley, C. E. Morgan, E. P. Waller, B. A. Hegeman, Jr., T. A. Kenney, M. B. Lambert, S. J. Cotsworth, C. R. Ellicott, J. W. Welsh, C. L. Henry, Edward Dana, F. W. Doolittle, G. C. Hecker, L. H. Palmer and J. H. Alexander.

Advisory Council to Hold New York Meeting

FOLLOWING a meeting of the Advisory Council of the American Electric Railway Association on the morning of Thursday, June 10, a general regional conference of executives will be held. This will be similar to the one held in Chicago last February for those in the central region. Invitations are being sent out to executives of electric railways in the eastern part of the country. The conference will convene at 3 p.m. on Thursday and will continue through Friday.

Matters of great importance to the industry as a whole and to each of the individual companies will be discussed by those actively engaged in directing the affairs of these companies.

A.E.R.A. Elects Members

NINE applicants for company and associate membership and 46 for individual membership were elected at the meeting of the executive committee of the American Electric Railway Association held on May 14. Following are the new company and associate members:

Operating

Anglo Argentine Tramways Company, Ltd., Buenos Aires, Argentina.

Associate

Ross W. Harris, consulting engineer, Madison, Wis.

Manufacturer

American Malleable Castings Association, Cleveland, Ohio.

Baltimore Copper Smelting & Rolling Company, Baltimore, Md.

DeVilbiss Company, Toledo, Ohio.

R. Roy Holden, Chicago, Ill.

Larkin Company, Inc., Buffalo, N. Y.

Martindale Electric Company, Cleveland, Ohio.

Railway Materials Corporation, Toledo, Ohio.

Bus Operation

ELIMINATION of a number of subjects from the list which the committee on bus operation will present in its final report marked a meeting held at association headquarters, New York, on May 20. Customer ownership of stock in bus companies and methods of buying tires were among the subjects dropped.

Advantages of establishing differential rates for chartered bus service, depending on the need for the equipment in regular service at that time, were outlined. Types of equipment with reference to their suitability for various classes of service were discussed. Gas-electrics received particular consideration. Possibilities of carrying packages, trunks, mail, etc., by bus were commented upon.

Determination of fares and the problem of non-paying lines were discussed at considerable length. The advantages of having the bus operating company carry its own insurance were brought out.

Members present were J. B. Stewart, Jr., chairman; V. W. Berry, E. D. Dreyfus, Adrian Hughes, Jr., R. N. Graham, S. W. Greenland, Alexander Shapiro, C. D. Smith and R. H. Smith.

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The News of the Industry

Governor Against New Haven Control Bill

Governor Fuller returned to the Massachusetts Legislature on May 13 a bill petitioning the right of the New Haven road to acquire the securities and property of the New England Investment & Security Company. In so doing the Governor has halted, at least for the time being, the plan announced recently by the New Haven company for rehabilitating the Springfield Street Railway and the Worcester Consolidated Street Railway, properties which the New Haven planned to reconstruct if acquired under the provisions of the bill.

In returning the bill the Governor authorized the statement that it seemed best for the public welfare to keep these two large street transportation systems free from railroad control. He further recommended that an amendment be added to the bill providing that all towns and cities served by these two transportation companies shall vote on the project of consolidation with the New Haven interests.

If these amendments were adopted, it was pointed out, not only the New Haven Railroad, but the cities of Springfield and Worcester as well would be at the mercy of the smallest town now served by either the Springfield or Worcester company. If the Board of Selectmen in any town, for political or other purposes, decided to force the railroad company to build an unprofitable extension, it would have the power, under the proposed amendments, to prevent the carrying out of the railroad's plan to spend more than $1,000,000 in improving street railway transportation in Springfield and a similar amount in Worcester.

In the form in which the measure went before the Governor the bill represented the result of more than three months of study on the part of the railroad committee of the Legislature. It embodied an agreement on the part of every interest, including the stockholders and bondholders of the railroad and of each of its subsidiary companies, and also of the officials of both Springfield and Worcester.

Notwithstanding these apparently very unfavorable developments, events took a turn at the last moment that may result in saving the legislation. After the bill had been held up by Governor Fuller and returned to the State Senate with suggestions and amendments that approval of the bill be subject not only to the city councils of Springfield and Worcester but also all other municipalities sharing the service of the two trolley companies, conferences concerning this change were held and were attended by Charles H. Beckwith, City Solicitor of Springfield; Senator George J. Chamberlain, Springfield; Mayor O'Hara and Senator Nelson, Worcester; Senator Look for the railroad committee, and George L. Barnes for the New York, New Haven & Hartford Railroad. Compromise was sought regarding the amendment. It was suggested that a majority of the other municipalities should suffice. Governor Fuller was willing to let it go if four-fifths of the cities and towns agreed. Later it was agreed by both parties that three-fourths of the municipalities served by the companies must accept the provisions before the railroad can proceed with its development plans.

It would appear now that this amendment is quite certain to pass both houses of the Legislature. It is found that the Worcester and the Springfield trolley lines serve 49 cities and towns, which means that the plan will become operative unless vetoed by thirteen of these municipalities.

Mayor Fordis C. Parker of Springfield did not favor the amendment to the bill. He let it be known that the superlative interest in the development lay with Springfield and Worcester. To him it did not seem right to make it possible for a group of small towns to hold the matter up.

Bills for Track Removal in New York Approved

A bill approved on April 16 authorizes the city of New York, with the approval of the Transit Commission, to acquire by condemnation the right to remove the street railway tracks from Central Park West and Eighth Avenue, between 59th Street and 116th Street, the cost of such removal to be divided between the city and the owners of the property benefited thereby. The removal of these tracks would cut the Eighth Avenue Railway in two, but it is expected that the large damages which would be awarded the company in the courts will discourage the city from undertaking this plan. Moreover, the difficulties of determining the extent of the benefits to be derived by adjoining realty would be great. The act is permissive only and the best informed do not believe the city will take advantage of the powers conferred by it. A somewhat similar act authorizes the city of New York to remove the street surface railway tracks from East 59th Street between westerly lines of Second and First Avenues, Manhattan.

One-Man Cars in Downtown Milwaukee

State Commission Permits Test for Six Months—Cars to Be Painted Different from Others—More Cars Recommended for Use in Regular Service

THE long-heralded order permitting the installation of one-man cars by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., on its Walnut Street line has finally been issued in favor of the company by the Wisconsin Railroad Commission. The new service will start on May 23. Instead of being permanent in character there will be a six months trial or test period, inasmuch as it will be the first one-man car line to run through the downtown section. All the other similar lines serve outlying sections.

The operation of one-man cars will result in more frequent service. The twelve cars now operated in the morning will be increased to sixteen and the sixteen now operated in the afternoon will be increased to 21. The same number of extra trains in rush periods will be provided as heretofore on this line. Because of their sole use in the downtown section the new cars will be painted a brilliant orange with a white band of cream around them in order that they may be easily distinguished from the yellow two-man cars. They will be the first city cars to be equipped with imitation gray suede seats.

The commission's order was the climax of many months of argument, in which city officials, civic organizations and patrons of the line opposed the extension of this type of car through the downtown area.

Coupled with its one-man car order, the commission also made public the results of its extensive report covering a general survey of railway service conditions in Milwaukee. It is one of the most comprehensive reports ever issued by the commission and represents a study of service conditions throughout the city for the past several months. This report will be made the basis of another hearing. Some of the commission's recommendations for providing more dependable and frequent service throughout the city were:

That 70 or 75 additional cars be purchased and placed in service, 21 to take care of inadequacies shown in the check of service, 24 to fill in because two-car trains fail to carry the loads at which they are estimated in the specifications, fourteen to provide additional service beyond turnback points on nine or ten lines, five to allow for cars in shops for repairs and a margin of six to ten cars to allow for readjustments in schedules which the dispatcher foresees will be necessary to allow greater running time on some lines. The report further recommended the double-tracking or extension of the Mitchell, Burnham, Eighth Street and Oakland Avenue lines.

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The commission found that single cars handled the crowds faster and moved more rapidly than the two-car trains.

Other recommendations made by the commission were that safety zones be lengthened to permit several cars to load, particularly where traffic is regulated by automatic signals, and that action be taken to stop the practice of automobiles parking so close to street car intersections as to interfere with the loading and unloading of passengers.

Coffin Award for Another Insull Property

The largest metropolitan electric lighting and power system in America received the 1926 Coffin award for meritorious public service when at the N.E.L.A. convention at Atlantic City during the week ended May 22, this distinction was bestowed upon the Commonwealth Edison Company, Chicago. Customer ownership, public relations, commercial activities, engineering developments and industry co-operation were some aspects of service in which the company was held to excel.

The Commonwealth Edison Company has more than 850,000 customers, a generating capacity of nearly 900,000 kva. and during 1925 produced more than 3,000,000,000 kw.-hr. of energy.

One Big Union at Winnipeg Seeks Government Aid

The one big union unit of street car men at Winnipeg, Man., has applied to the Dominion government for a board of conciliation, under the industrial disputes act, to investigate the situation which has arisen due to the actions of the Winnipeg Electric Company in refusing to negotiate an agreement with the one big union unit.

The company has signed an agreement with the Amalgamated Association, Division 99, granting an increase in pay of 1½ cents an hour to one-man car operators and an increase of 6½ cents an hour to bus operators, putting both these employees on the same wage basis.

The previous agreement of the company with its men was signed in 1922 between the company and a committee representing the motormen and conductors, but during the past twelve months the "One Big Union," which is a communistic organization, has obtained control of this committee. When the agreement expired on April 30 the company took the stand that it would not negotiate an agreement with any body of men whose affairs were controlled or whose actions were influenced by the one big union. If the men will eliminate O. B. U. influence the company will grant them the same agreement the Amalgamated has obtained.

This, in brief, was the situation on May 18. Up to May 21 there had been no further developments, but there appeared to be a possibility of the government appointing a board of conciliation during the week commencing May 24.

The company employs about 900 men on 115 miles of road.

Month's Delay in Albany Fare Case

A hearing was held by the Public Service Commission on May 14 at which the United Traction Company submitted valuation figures in the matter of its application for a 10-cent fare or thirteen tokens for $1 as an increase over the present 7-cent fare. A delay of one month has been granted by the Public Service Commission to enable the city of Albany, N. Y., to study the figures submitted by the company. In the interval a separate hearing will be granted on the Troy situation and the commission will pass on the arguments made by Troy that the commission is powerless to grant increases in fare on the company's lines in Troy because of a law passed by the Legislature designated to limit Troy fares to that specified in franchises granted by the city.

James B. McMartin, chief engineer of the Delaware & Hudson Railroad, who supervised the making of the United Traction Company inventory, testified that the values indicated were of Dec. 31, 1925. He gave the final value of the entire United Traction plant, the cost to reproduce it as of Dec. 31, 1925, as $18,350,374. The cost of the company's Albany plant is estimated at $5,035,352. Figures for some of the other communities follow: Rensselaer, $261,188; Menands, $231,946; Colonie, $71,510; Watervliet, $1,103,867; Waterford (town), $164,978; Waterford (village), $93,919; Cohoes, $706,261; Green Island, $280,885; Troy, $3,597,404.

Municipal Men Seek Wage Change

Employees Want Scale Calling for 7 Cents an Hour More than that Now in Force—Full Statement of Demands as Presented

EMPLOYEES of the local Department of Street Railways at Detroit, Mich., have requested a conference with department officials on a proposed new wage schedule calling for a general increase of 7 cents an hour for platform employees. The new wage schedules include for the first time carhouse employees, embracing car sweepers, washers and pit repair men. The demands were presented by a committee representing Local No. 26 of the Amalgamated Association. The present wage agreement expires on June 1.

Exceptions to the flat increase of 7 cents an hour are made in the cases of the platform employees for the first six months of service, who are scheduled to receive an increase of 5 cents an hour; for the second six months, an increase of 6 cents an hour is provided, and for one-man car and motor coach operators and owl car and snowplow platform operators an increase of 5 cents an hour is proposed. The new schedules provide the following rates:

	Cents an Hour
First six months	70
Second six months	75
Thereafter	80
One-man car and motor coach operators	85
Owl car men	88
Overtime	$1.00
Overtime for one-man car and motor coach operators	$1.05
Snow plow service	$1.00
Minimum platform men's wage	$80.00 a month
Instructors, 50 cents a day in addition to regular wages.	

The schedules for the new services covered by the union scale were announced as follows:

	Cents an Hour
Construction car platform men	80
Laborers in construction yard	62
Yardmen, carhouse men sweepers	62
Pitmen	82
Pitmen's helpers, first six months	67
Thereafter	72
Controller men	87
General repair men	82
Fare box men	$185.00 a month
Pump men	$185.00 a month
Janitors	62
Watchmen	62
Station cashiers	$155.00 a month
Garage repair men	87
Garage helpers	80
Coach cleaners	62

The schedule committee wants a revision of schedules which would shorten the working day by the time between runs when the men are idle. Schedules are desired giving the men as nearly as possible straight working hours without split runs. It is suggested that on scheduled runs where the time is in excess of eleven hours, platform men shall be paid 25 per cent more than the regular wage for the first hour and 50 per cent more for the second and third hours. No run is to exceed fourteen hours.

Tripper Runs a Problem

Runs less than six hours in duration are to be considered tripper runs and are to be paid at actual platform time except that no tripper run shall be less than two hours. The number of tripper runs is limited to 5 per cent of each given schedule.

It is provided that in case any electric line is motorized, the men employed on the line shall be placed on other lines without loss of seniority rights.

Regular men whose runs terminate after midnight are not to be asked to report the next day before 10 a.m.

The regular rate for an eight-hour day is to be deducted for absence. Other provisions include a seven-day vacation with pay every year after the first six months' service, and a ten-day vacation every year for fare box men, with every second Sunday off. Station cashiers are to be allowed ten days' vacation a year with every third Sunday off.

A statement attributed to officials of the local division of the union says D.S.R. platform men are 99 per cent unionized. Car sweepers, pitmen, car washers and carhouse employees have been invited to meet a committee appointed to discuss wages and working conditions intended to apply to the platform employees.

Aside from fixing wages the agreement provides that in case of grievances and disputes platform men are to be permitted to be represented in hearings by the representative or representatives of the employees chosen by the associated employees. This term "associated employees" is used by the men to designate their union.

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Richmond Franchise Adopted

Without a dissenting vote and with no material amendments which affect the future operation of the Virginia Electric & Power Company, the proposed blanket traction franchise has been adopted by the Richmond Common Council just as it came from the streets committee with the approval of that body. It is probable a special meeting of the Board of Aldermen will be called to dispose of the measure.

The franchise is acceptable to the Virginia Electric & Power Company. That company's "surrender instrument" was read and approved by the Council. The instrument recites the manner in which the company's property is to be transferred to any other company that may obtain the franchise when it is offered for sale. It is to surrender all existing franchises and is required to sell to the purchaser its property at a valuation fixed at $9,491,084, slightly less than the amount allowed by the State Corporation Commission when that body fixed the present rate of fare.

The company, under the provisions of the franchise, is to pay upon its gross receipts as a tax, a certain sum, beginning with 5 per cent and gradually dropping annually until within ten years such tax shall amount to 3 per cent, at which figure it is to remain until the expiration of the franchise. It is also to pay for paving between its tracks and 2 ft., on each side, and agrees to turn over to the city any of its viaducts within a period of five years at no cost to the city. Permission is given the company to extend its service in several directions by the laying of new tracks and to augment its present fleet of passenger buses. The company may at some future date be required to install an underground system on Board Street, and it was provided that the city might, whenever the necessity arises, require the removal of the one-man cars.

A $1,500,000 improvement program is planned for this city by the Virginia Electric & Power Company. Fifteen passenger buses will be added to the present fleet and fifteen new street cars, representing an outlay of $200,000, have arrived in Richmond to augment those already in operation.

Akron Interurban Service Under Way

Interurban cars are now running between Akron and Massillon on the Northern Ohio Power & Light Company system. The first interurban car started between Canton and Massillon on May 18. Massillon officials dug up a twenty-year-old ordinance which provided that interurban men must have nine days training in the city before they could operate cars in the city. Some crews operating cars were arrested, but the company kept on operating.

The first serious strike disorders in Akron occurred on May 20, when the Northern Ohio Power & Light Company began interurban operation between Canton and Akron. Strikers smashed windows in nine Canton city cars and tried to wreck an interurban mail train near North Canton. The company obtained a temporary injunction in the federal court of Cleveland against Patrick J. O'Brien, vice-president of the Amalgamated Local. Federal officials are also planning to take action against men involved in the attempted wreck of the mail train. Despite disturbances, the interurban cars kept fairly well on hourly schedules during the day. At night the interurbans are shut down.

The union men admit their cause is lost in Akron and Canton, but pin their hope to the Akron-Cleveland interurban. They declare that is the division upon which they hope to win. Just when the company plans to open its Akron-Cleveland line has not been fully determined. No early attempts will be made to operate cars in Massillon. The company had applied to the city before the strike for permission to abandon its city system. The company is in no hurry to operate its interurban line south of Massillon for the reason that the line has been losing money for years. Arrangements have been made with other operators for the establishment of a bus line in that territory.

Edward McMorrow, who has been handling the strike situation for the Amalgamated, has been replaced by P. J. O'Brien, another vice-president.

Franchise Agreement Defeated in Omaha

Citizens of Omaha, Neb., by a vote of about 5,000 at the election held on May 13 defeated the proposed franchise agreement between the city of Omaha and the Omaha & Council Bluffs Street Railway. The ordinance covering the new agreement was passed by the City Council on March 30. It provided for neither an exclusive nor perpetual grant as to buses or street railway system or both. Right was reserved to the city to acquire the property and take over its operation.

For a number of years there has existed between the city of Omaha and the Omaha & Council Bluffs Street Railway a difference of opinion as to the duration of the company's principal franchise in Omaha. The city contended that this franchise expired in 1928, while the company was advised by its attorney that the franchise was perpetual. The city further held that the company's right to make extensions had already expired. With this uncertainty regarding the matter everything was at a standstill and would have to remain so until there was an adjudication by the courts or until the question was disposed of in some other way. After careful consideration the company decided that it would be far better, both from the standpoint of the city and from the standpoint of the company, to negotiate for a new franchise rather than to litigate the matter.

Rates Reduced on Massachusetts Line

The Atlantic Improvement Association, Atlantic, Mass., has won its fight for reduced fare rates in the Squantum-Atlantic section from the Eastern Massachusetts Street Railway.

The Improvement association, representing citizens of the town and headed by Joseph M. Goode, Jr., objected to the 10-cent fare rate in Atlantic. The railway did issue a commutation fifteen-ride ticket for $1, or 0.0667 cents per ride. This ticket, however, could not be used in the Atlantic-Squantum district.

The board of trustees voted to make fares on the Squantum line from the end of the line at Squantum to Atlantic depot, 10 cents cash or one punch on the Quincy fifteen for $1 ticket. From the end of the Squantum line to Quincy Square 15 cents cash with a free transfer privilege at Atlantic Depot, or two punches on the fifteen for $1 ticket, one punch to be made between Squantum and Atlantic Depot and another punch between Atlantic Depot and Quincy Square. The cash fare between the end of the line at Squantum and Neponset will be still 19 cents, with a free transfer at Atlantic Depot.

Suggestions by Chicago Railways to Be Received

Chicago is about ready to listen to the proposals for a franchise settlement made by Surface Lines officials and the seven committees representing the security holders. The ordinance which has been under consideration by the committee on local transportation of the City Council reflects the attitude of the city alone.

It is understood that when all the differences are ironed out, a new ordinance will be drafted and submitted to the voters next November.

The report of the Citizens' Advisory Subway Committee, which was appointed to induce downtown property owners to agree to voluntary assessments to pay the cost of a proposed subway, is expected in the next few days. Practically 80 per cent of the property owners in the Loop district, it is stated, have already signified their willingness to stand assessment for this purpose.

Assurance has been received from Major R. F. Kelker, Jr., the committee's engineer, that the technical parts of the separate ordinance for the subway lines will be completed in about four months. The question of unification of elevated, surface and subway lines will be taken up after the terms of the surface and elevated ordinances have been arranged.

Rather than accept the $152,500,000 which was represented as the valuation of the Surface Lines in the traction ordinance defeated last year, or any other previous estimate, the committee has decided to leave the question open until officials of the company can present their position. The committee approved and inserted in the tentative ordinance, however, the present requirement that the companies set aside 8 per cent of their gross income for a depreciation and renewal fund.

Objection has been expressed in committee sessions to the suggestion that the companies be relieved from the obligation to pave and clean the part of the streets occupied by their tracks, but no definite agreement has been reached on this.

Talk of subways has been revived by the incorporation of the Chicago Tube Transit Company by W. J. Newman and associates.

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New York's Governor Approves Thayer Bill

Governor Smith of New York has signed the Thayer bill as chapter 846 of the laws of 1926 amending subdivision two of section 54 of the public service commission law, in relation to the purchase and holding by a corporation, organized under and pursuant to the provisions of the transportation corporations law, of the capital stock of another corporation so organized.

The public service commission law now provides that no railroad corporation, street railroad corporation or electrical corporation, domestic or foreign, shall hereafter purchase or acquire, take or hold any part of the capital stock of any railroad corporation or street railroad corporation or other common carrier organized or existing under or by virtue of the laws of this state, unless authorized so to do by the commission empowered by this chapter to give such consent.

It further provides that no stock corporation of any description, domestic or foreign, other than a railroad corporation, or a street railroad corporation, shall purchase or acquire, take or hold more than 10 per cent of the total capital stock issued by any railroad corporation or street railroad corporation or other common carrier, organized or existing under or by virtue of the laws of New York state.

In his memorandum approving the bill Governor Smith said:

> This bill proposes to include corporations which own or operate a stage, omnibus or other vehicle line or route which is now under the jurisdiction of either the Public Service Commission or the Transit Commission.
>
> When the original public service commission law was enacted, motor-driven stages and buses were not in common use. Today they are gradually being accepted as the modern means of transportation both inside and outside of our large cities, and should, therefore, be brought under the control and regulation of the Public Service Commission.
>
> For the above reasons the bill is approved.

Survey and Bus Extensions in Sacramento Planned

The Pacific Gas & Electric Company recently began a survey of its Sacramento, Cal., railway service for the purpose of submitting a definite plan of bus line extensions based on a 7-cent fare. This action was agreed upon between Councilmen and heads of the company. It is said that the company officials, even if they are successful in securing fares, are unwilling to consider railway extensions.

Wigginton E. Cress, president of the company, said he blamed the automobiles for the failure of the company to make the street railway business a paying venture. He said his company was losing money, but it was willing, as an experiment, to try the buses further, provided it could obtain additional revenue. He said he was not at all certain that an increase in fares would solve the problem.

The car and bus miles operated in 1925 were less than in 1920, being 3,233,015 in 1925 and 3,320,454 in 1920. The company had charts to show that revenues were $13,000 less last year than in 1924, but gross expenses were cut about $47,000. If the company's plans meet with the approval of the city authorities they say they will back the company before the Railroad Commission in an attempt to secure higher fares.

Franchise in St. Louis About Ready to Be Discussed

The service-at-cost ordinance for the St. Louis Public Service Company, which will succeed the United Railways, St. Louis, Mo., when the property of the latter company is sold under foreclosure proceedings, will be presented by Mayor Victor J. Miller for public discussion within the next few weeks. A vote of the people on the grant will be brought about through the initiative provisions of the city charter.

Mayor Miller and the railway men have agreed on a plan which will give the city arbitrary authority to order extensions and to specify the character of the service so long as a fare is provided which will enable the company to pay operating expenses and earn a fair return upon the property valuation. The valuation and rate of the return will be fixed in the ordinance.

Substitution Bill Signed by Governor Smith

Governor Smith of New York on May 18 approved the Messer bill as chapter 840 of the laws of 1926 amending the public service commission law by adding a new section 50-a, authorizing the commission after a hearing to permit the substitution of buses for cars on tracks on street surface or other railroad route.

Railway-Bus Proposal for Washington Cities

The City Commission of Chehalis, Wash., has received application from Earl B. Mills, Chehalis, and W. E. Bingham, Centralia, for a franchise for a railway bus system, with gasoline-propelled cars, to be operated on designated Chehalis streets, providing a fifteen-minute round-trip service in that city. The two applicants have also filed a petition with the State Department of Public Works, asking for a franchise in Centralia and also to connect this proposed service between Chehalis and Centralia, the whole making a one-hour round-trip service. Should all franchises be secured, Messrs. Mills and Bingham plan to put four twenty-passenger buses into service, which would give a fifteen-minute service between the Twin Cities. Local fare in Chehalis and Centralia would be 5 cents, with a 15-cent fare from any point in either city to any point on the regular traveled route in the other city. Fare between city limits would be 10 cents. Term of franchises for Chehalis and Centralia is proposed to be twenty years. Pay-as-you-enter cars will be operated.

Mayor West of Chehalis does not favor granting such a franchise. He calls attention to the fact that there is now a half-hour electric interurban service between the two cities, with railroad service at various times during the day, and that the interurban cars rarely carry any great number of passengers on a single trip.

Wage Negotiations to Be Taken Up at Toledo

Negotiations between the Community Traction Company, Toledo, Ohio, and the street car men's union over a new wage scale and revised working conditions will be taken up in the next fortnight. The present contract expires on May 13.

The present scale is 55 cents for all workers in service more than a year, 52 cents for those in service nine months and 50 cents for beginners. Bus drivers and operators of one-man equipment receive an additional 5 cents an hour.

No official announcement has been made but it is understood the men will ask an increase of 10 cents an hour.

Another Wage Proposal to Be Presented to New York State Men

Negotiations are to be reopened between representatives of the New York State Railways and the union with another proposal to be presented to the employees operating in Rochester, Syracuse and Utica. This is the next step following the joint vote on May 11 in which the men rejected the offer by the company for a wage and working agreement retroactive to May 1. This action on the part of the men was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 15, page 861. Polls were conducted simultaneously in the three cities. Walter F. Norton, business agent at Rochester, where the vote was tabulated, would not reveal the vote figures. The terms which the workers voted down failed to provide for any increase in wages, but made some concessions to the men in working conditions.

The present scale which the company wishes to renew calls for 55 cents an hour for members of city crews, 57 cents for interurban operators and 60 cents for bus and one-man car employees. The Rochester union members were out strongest for the wage increase, primarily because the railway put a 1-cent fare advance into effect there on Jan. 1.

It is hoped that the matter may be settled without resorting to arbitration. Magnus Sinclair, international organizer, said there was absolutely no possibility of strike action.

Census of Chicago Loop

People in the downtown district of Chicago, Ill., were waylaid at every turn on May 12 by representatives of the Chicago Association of Commerce and asked to indicate what form of transportation they used in covering the distance from their homes that day. In banks, retaurants and office buildings similar questions were tabulated on cards. Of those persons arriving in automobiles, the tally markers wished to know whether the machine was driven by a chauffeur and where it was parked. The census is a part of the metropolitan street traffic survey now being conducted by the Asociation of Commerce with a view to showing how many persons come into the "Loop" district daily and how street congestion may be reduced.

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Extension of Time Under New York Electrification Bill

Governor Smith of New York on May 18 signed the Senate rules committee bill amending the Public Service Commission law by authorizing the commission after a hearing to extend for not more than five years from Jan. 1, 1926, the time of any railroad or terminal corporation to comply with the provision for electrification of roads in New York City.

Supreme Court Upholds Validity of Duluth Case

The Minnesota Supreme Court in a decision on May 14 upheld the state law of 1921 covering the regulation of street railways. The court affirmed the District Court in St. Louis County in the case of the city of Duluth against the Minnesota Railroad and Warehouse Commission. After an order by the commission establishing street car rates in Duluth the Duluth Street Railway made further application for increased rate of fare and asked for determination of the valuation of its properties. The city sought a restraining order in the District Court to prevent the commission from holding more hearings and attacked the validity of the law itself. The railway contended that the 6-cent fare then in effect yielded only 70 per cent of a fair return on the capital investment. District Judges C. R. Magney, H. J. Grannis and E. J. Kenney, sitting together, held the law valid, and the Supreme Court has now affirmed their opinion.

News Notes

Amalgamated Issue Under Advisement.—A motion to dismiss the complaint filed by the Amalgamated Association against the city of Indianapolis, chief of police and others for a restraining order against interference with officers and employees of the association in their efforts to organize a branch in Indianapolis was taken under advisement by Judge Robert C. Baltzell of the United States District Court on May 15. The motion to dismiss was filed by the city and set out fourteen points attacking the jurisdiction of the federal court and denying that rights of the officials of the association were violated by local police as alleged in the complaint. The complaint was filed following the arrest of Robert Armstrong, a vice-president of the association, and other employees.

Railway Transports in Taxis.—Taxicabs were used recently by the Chicago, North Shore & Milwaukee Railroad in Milwaukee, Wis., to maintain service when a fire adjoining the Sixth Street viaduct, over which its cars operate, paralyzed all service between Milwaukee and Chicago. When the fire broke out many persons southbound for Racine, Kenosha, Chicago and intermediate cities were waiting at the main depot. They were loaded into taxicabs and taken over another viaduct to a temporary station established at First and National Avenues, where they boarded an emergency southbound train. On the return trip the same cabs took the waiting northbound passengers to the main station.

Recommends Relief from Paving Costs.—Two committees of the Danville, Va., City Council recently heard arguments from C. G. Holland, president of the Danville Traction & Power Company, in behalf of the modification of the company's franchise and relief from the obligation of paying the costs of street paving between the tracks. The two committees joined in a recommendation to the Council for this relief. As a two-thirds majority concurred in this action, the railway may be said to have won its point.

Wage Contract Renewed.—The Aurora, Elgin & Fox River Electric Company, Aurora, Ill., has renewed its contract with its employees for the ensuing year at the same scale. The employees voted two to one to accept the existing wage. Some changes in working conditions were agreed upon.

Summer Rates in California.—A new schedule has been arranged which provides residents of the territory served by the San Francisco-Sacramento Railroad and the Sacramento Northern Railroad with attractive excursion rates. Under the provisions, tickets good for sixteen days will be sold daily at the rate of one and one-third single fares for the round trip from all points on the two roads and the Sierra Nevada Stage Company and Pierce-Arrow Stage Company to Oakland and San Francisco. The new rates became effective April 30.

Tragic Accident at Atlantic City.—Mrs. Fannie L. Denman, wife of B. J. Denman, vice-president and general manager of the United Light & Power Company, resident at Davenport, Iowa, was killed on May 18 while riding a horse along the beach at Atlantic City. Mrs. Denman was thrown from her horse and suffered a broken neck. She died almost immediately. Mr. and Mrs. Denman were attending the annual convention of the National Electric Light Association.

Another Name Wanted.—An organization newspaper written for and by the employees of the Worcester Consolidated Street Railway, Worcester, Mass., has made its appearance and will be published in the future on the first payroll day of every month. The inter-district news organ is still nameless, being captioned with an interrogation point, but a contest is under way among employees for the selection of a name. The publication contains news of the road, shops and offices, interspersed with bits of humor and anecdotes contributed by employees.

Work Started at St. Petersburg End.—Ground was broken in St. Petersburg on May 8 for the first gas-electric interurban railway, the Florida Interurban Rapid Transit Railroad, that will connect Tampa and St. Petersburg. Actual construction work on the roadbed has already been started. A survey for the route has been completed and 96 per cent of the right-of-way for the route has been acquired. Reference was made to the progress of this project in the ELECTRIC RAILWAY JOURNAL previously.

Railway Plays Its Part.—In honor of "International Boys' Week" the Tacoma Railway & Power Company, Tacoma, Wash., issued special rate tickets on May 8 good all day for grammar and high school students. The company co-operated with Harold R. Pirret, chairman of Boys' Week in Tacoma, in an effort to make the celebration of that week a successful one.

Wage Contract Renewed.—Trainmen of the Wheeling Traction Company, Wheeling, W. Va., have renewed their contract with the company for three years at the old scale. This provides 49 cents an hour for the first three months of service, 52 cents for the next nine months and 57 cents thereafter. Operators of one-man cars receive 5 cents an hour additional.

New Fare Schedule Approved.—The Public Service Commission has approved a new tariff of the Southern New York Railway, Inc., providing for the sale of books containing 30 single tickets, good for transportation of purchaser and member of purchasers' family within 30 days from and including date of sale. The stations included in the tariff are as follows: West Oneonta and Junction, $2; Laurens and Junction, $5.85; Index and Cooperstown, $2.90; Cooperstown and Fly Creek, $5.85; Cooperstown and Toddsville, $3.85. The new fares are effective on June 14, and will continue in effect until June 14, 1927.

"Stop" Signs Ordered.—Several thousand new "stop" signs have been ordered by the Georgia Railway & Power Company, following an order of the Public Service Commission changing approximately 500 car stops on the Atlanta lines. While the commission's order calls for only 500 stops, the company has decided to place new "stop" signs at every stop in the city. The new signs are orange in color, with black lettering, making them more attractive than the old "stop" signs and giving them greater visibility. Within ten days work of rearranging and locating signs will be started.

Baltimore Attends to Complaints.—The United Railways & Electric Company, Baltimore, Md., received a total of 1,953 complaints during 1925, all of which were given the required attention. With a traffic of 330,000,000 revenue passengers this means there was about one complaint from every 163,850 people. The company states that not a single complaint is ignored, every one being subjected to investigation and scrutiny. In its "Service" bulletin the company states that it knows "it has a public that is critical but not sullen, watchful and articulate, but not hopeless of the company's sincerity."

Fares Reduced to Encourage Land Settlers.—To encourage settlement in the attractive new residential districts along Lake Michigan to the north of Chicago, the Chicago, North Shore & Milwaukee Railroad has recently announced a reduction of nearly 53 per cent in the rates for commutation tickets from all suburban communities on the main line and new Skokie Valley division, as far north as the Wisconsin state line. The new schedule, which applies to 10, 25 and 60-ride tickets to Chicago, is effective June 1.

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Recent Bus Developments

Michigan Bus Operators Included in Agreement

The dispute between the Michigan Electric Railway, Jackson, Mich., and the Amalgamated Association over the inclusion of bus operators in the Amalgamated agreement with the railway was recently settled by arbitration. An amendment was introduced in the present contract which provides for the inclusion in the existing contract of all motor vehicle employees in the service of the company. This change is intended to bring within the protective terms of the agreement bus operators employed directly by the Michigan Electric in cities and also employed in bus operation between the cities of Lansing and St. Johns, but it especially excludes all others employed in interurban service. The amendment will not cover interurban bus drivers who are in the service of the Southern Michigan Transportation Company, a subsidiary of the Michigan Electric Railway operating between Jefferson, Battle Creek and Kalamazoo, known as the Southern Division, and between Jefferson and Lansing, known as the Northern Division. The agreement was signed by George A. Kelly and Norman E. Leslie. Richard Price, the third arbitrator, plans to submit a minority finding.

Buses Operated at Loss in Tampa

Operation of buses in connection with the railway lines in Tampa, Fla., by the Tampa Electric Company is being carried on at a loss, according to a reported statement of Peter O. Knight, president of the company. Although the bus fare is 10 cents—twice as much as the railway fare—the company has been unable to make any net returns from the operation of buses, which was started in September, 1925. The company now has 23 buses in operation, and the results to date show total gross receipts insufficient to pay operating expenses. In order to keep up with increased population, the railway has ordered fifteen more cars for operation and eight more buses.

Bus Rights Granted in Westfield

The effort of the Springfield Street Railway to obtain additional licenses to operate other bus lines in Westfield, Mass., was successful on May 6 when the City Council of Westfield agreed to grant the necessary authority to operate. With the placing of these additional bus lines in service will come the abandoning of practically all the trolley lines in Westfield. Only one cross line trolley route will be operated in addition to the suburban line to Springfield.

The railway was granted licenses to operate two bus lines last fall, and at that time it discontinued railway service on Mill and Union Streets. Permission to add new bus routes will eliminate trolleys on Broad, West Silver, East Silver and Franklin Streets and on the Huntington line.

The only remaining intercity railway line will be operated from the Highlands to North Elm Street, at Clay Hill. The Westfield-Holyoke line will be abandoned. The company has agreed to operate buses to St. Mary's Cemetery, which heretofore was served by the Holyoke trolley.

Westfield has been decidedly against the abandoning of any of the trolley lines. The question has come up many times over a period of a year until it was finally stated that the railway would not continue to operate any of the railway lines at a loss. Thus the City Council was confronted with giving the required bus licenses or running the chance of seeing the railway withdraw service. The railway has promised an efficient service with buses.

Buses Meet Emergency in Akron

Vehicles Turned to Advantage to Meet Strike Conditions—Full Story of What Was Done to Transport People in City and Interurban Service

THIS is a bus story—the story of how buses met an emergency in Akron city service and in interurban service from Canton to Cleveland when 750 platform men employed by the Northern Ohio Power & Light Company struck on May 1.

It was not until 9 o'clock Saturday night, May 1, that the company learned trainmen would not take the cars out Sunday morning. That meant Sunday churchgoers would have no service except that supplied by buses and the few cars manned by employees who remained loyal. Twenty-eight street cars left the Kenmore carhouse Sunday morning on the main Akron city lines. Buses supplied the rest of the service.

On the Canton-Akron-Cleveland line not a car left the carhouse. It was up to the buses to stand alone. At 4 o'clock Sunday morning, seven hours after the Amalgamated Association had issued the order to strike, the first bus left the Terminal Building in Akron for Cleveland.

Right there this story starts. Commencing at this early hour—4 o'clock—on May 2, a bus entered or left the Terminal Building with a load of passengers every nine minutes until midnight—twenty hours later. And all of these trips were operated between Cleveland, Akron and Canton. A total of 140 trips was operated between Cleveland and Akron and 40 between Akron and Canton, a grand total of 180. Assuming that an average of 25 passengers was handled each trip, the buses moved 4,500 persons.

All of this operation was accomplished with a fleet of 25 buses—an average haul of 180 persons per bus. If all of the bus trips made during the day—180—were combined in one line, they would have made a bus caravan a mile long, with 120 ft. to spare for good measure.

What the bus company did on this day it has been repeating virtually every day since. Morning, noon and night the buses, like Tennyson's famous brook, go on and on, that transportation needs of the public may be efficiently satisfied.

To perform this tremendous service the bus company, on these 180 daily trips, operates approximately 6,500 miles, as compared with 3,000 miles before the strike. The 180 trips represent an increase of 96; the daily average previous to the strike was 84.

True, 22 buses were added to the total fleet and every bus owned by the company was pushed into service during the first week. Buses that were in the shops for repairs were rushed through and in service in two days. Ten new buses came from Cincinnati and twelve from various other sources. The close of the third week will find twenty more in service over the system.

When the strike came, the company was operating 114 buses in Akron city. Two days later the company had 130 in operation and two days more 140 were in use, with 58 interurban buses running. Most of these buses were drawn from the reserve supply.

Did they furnish the city service? The people say they did. Of course, there was much crowding. The buses were loaded, but the equipment stood up well. Of course the condition that existed could not be continued indefinitely, but the buses served satisfactorily until normal railway service was restored in Akron and suburban districts.

It is true that the public welcomed the car service back. This only goes to furnish additional evidence that coordinated bus and rail transportation is what they want.

The interurban situation was different. Patrons paid approximately 40 per cent higher fares on the interurban buses than they formerly did on the cars. They did this willingly and there have been few complaints. The interurban buses have been crowded, and it was necessary at times to switch city buses into interurban and suburban service. The complaints that came in were from the Akron-Canton division, where the service was not so good as between Akron and Cleveland. Between Canton and Massillon, where four big buses furnished a fifteen-minute service, there was not a single complaint. Fares by bus and by rail in the city of Akron were the same.

Although service was more than doubled, the efforts made merely represented what a loyal organization can do in an emergency. In brief, it is the "acid test" of bus service in northeastern Ohio. Every man in the company's bus system just put his shoulder to the wheel and worked faithfully. As one

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of the interurban bus drivers expressed it, by quoting Elbert Hubbard: "If you work for a man, in Heaven's name work for him. If he pays you wages that supply your bread and butter, work for him, speak well of him, stand by him and stand by the institution he represents. If put to a pinch, an ounce of loyalty is worth a pound of cleverness." That's the secret of the operation.

Credit for this successful bus operation is shared by all departments of the company. The garage force, like the bus drivers, has battled 100 per cent. The men that compose it have kept the equipment serviced, day and night. In fact, the records show that the fleet of buses has operated 97.5 per cent perfect. And when that per cent in operation is reached, it is a job pretty well done.

When it is taken into account that the majority of the buses are on the road twenty hours a day, an adequate idea is conveyed of the maintenance problem. It's a four-hour job; that is, the mechanics have four hours in which to work to keep the buses running twenty. Then, too, it must be remembered that five different kinds of equipment are used—Yellow Coaches, Whites, Pierce-Arrows, Studebakers and Fageols. This means that both the operating force and the mechanical force must be more or less versatile. Necessity often requires that a driver or a mechanic be shifted from one make of bus to another, so that service may not be interrupted. But it was done, and buses have demonstrated what they could do in an emergency when operated by a company that knows the transportation business. At no time was there the slightest confusion. Schedules were kept almost to the minute.

The buses performed a real service—a service that pleased the public, kept transportation going and proved a blow to the Amalgamated Association.

Partial Bus Substitution Proposed in Westchester County

The Westchester Electric Railroad has petitioned the Public Service Commission for permission to abandon a portion of its route in the town of Eastchester and the village of Tuckahoe, Westchester County, N. Y., and substitute bus service to be supplied by the Eastchester Transportation Corporation. It is claimed that this part of the route does not pay the operating expenses. Main Street, Tuckahoe, is to be paved, the petition says, and the village desires to have the tracks removed when the new pavement is laid.

Consents to bus operation have been given by the village and town authorities. It is proposed to operate buses between 6 a.m. and 1 a.m. on not more than a fifteen-minute headway. A 10-cent fare is proposed, with free transfer from the buses to the intersecting electric railway lines. Transfers will be given from the electric railway lines to buses for an additional fare of 5 cents. For pasengers traveling only between the Tuckahoe Railroad station and Waverly Square or between the Tuckahoe station and Bronx River it is proposed to charge a 5-cent fare. Where the 5-cent fare is effective no transfers will be given according to the petition.

Bus Routes in Northern Illinois Proposed

The Western Motor Coach Company, headed by Britton I. Budd, associate of Samuel Insull and president of the Chicago, Aurora & Elgin third rail line, has applied to the Illinois Commerce Commission for authority to operate a network of bus lines through northern Illinois, which would serve that section, the southern Wisconsin territory and connect with other lines reaching through Iowa, central and southern Illinois and Indiana. Elgin will be the hub of the proposed system. The four principal routes are between Wheaton and Westmore, Elgin and Bellwood, Oak Park and St. Charles and LaGrange and Aurora.

Buses Leased for Use in Toledo

Seven buses have been leased by the Community Traction Company, Toledo, Ohio, for use on Front Street while tracks are being taken up from that street and repaving is in progress. The City Council last year voted to tear up the tracks on that street.

Plans for a permanent bus service are not complete, but in the Riggs survey it was recommended that bus lines supplant car lines on all except the downtown loop, which could be cared for by several other east side lines through transfer.

The buses are owned by the Union Motor Truck Company, Bay City, and have been in use before in Detroit.

The new equipment is operated by employees of the Community Traction Company. The new plan of leasing equipment and operation by company employees has been found much more satisfactory than the "farming out" plan tried in Toledo for more than a year on some feeder lines.

Seven Cents on Buses.—Permission to increase bus fares immediately from 5 to 7 cents on all lines in the city of Evanston, Ill., was recently granted to the Evanston Bus Company, a subsidiary of the Evanston Railway, by the Illinois Commerce Commission. A rate of $2.25 for a 50-ride ticket, however, will be maintained for the benefit of students of a new high school at the western limits of the city.

Bus to Be Given a Trial. — The Menominee & Marinette Light & Traction Company is considering the purchase of a 21-passenger bus with a view to experimenting with bus service in outlying territory to determine whether patrons, city officials and the company would prefer bus to railway operation on outlying lines. The company hopes to give the plan a trial in Marinette, Wis., and Menominee, Mich., during the summer months.

New Route Authorized.—The Public Service Commission on May 17 granted a certificate to the Rochester Railways Co-ordinated Bus Lines, Inc., for the operation of a bus line in the city of Rochester, N. Y., and town of Irondequoit. The route will connect with the Rochester Street car lines at St. Paul Street and Ridge Road and will make a belt through the town of Irondequoit, connecting again with the street car lines at Clifford Avenue and Culver Road. The route is divided into three zones with a 10-cent fare in each zone. There was no opposition at the hearing to the granting of the petition.

Bus Company in Nashua.—Buses operated in the interest of the Nashua Street Railway, Nashua, N. H., will be run by the recently organized Nashua Transportation Company, incorporated under the state laws with the following officers: President, Josiah E. Fernald; secretary, Chester W. Clark, both of whom are directors with Englehardt W. Holst, manager of the railway.

Problems of Miami Beach to Be Discussed.—Citizens of Miami Beach, Fla., and officials of the Miami Beach Electric Company will consider, it is reported, the advisability of a double-deck bus system to replace the present railway system in Miami Beach. The decision came about as a result of a written communication from the Miami Beach Realty Board to members of the City Council. City Manager Renshaw will make a report after consultation with citizens and railway officials.

Permit Authorized Between East Chicago and Hammond. — The Gary Railways has received a permit from the Public Service Commission to run a bus line from Cline and Block Avenues, in East Chicago, to Sheffield and Gostlin Avenues, Hammond, Ind. The commission denied a petition of the Midwest Motor Coach Company to operate a bus line between Gary and Hammond and refused to grant the right to the Gary Railways to operate a new line between Gary and Hammond. In the two denials the commission ruled that public convenience and necessity did not require the proposed bus service.

Would Extend Bus Services.—The Pacific Electric Railway has applied to the California Railway Commission for authority to operate motor coach service in the city of Pasadena, covering lines now operated under the name of the Pacific Electric Land Company.

Buses Authorized to Replace Cars.—The City Council of Salem, Ore., on May 3 granted permission to the Salem Street Railway to discontinue railway service on its South Commercial Street Fair Grounds line and to substitute buses. The Council also reduced from $50 to $25 a year the license fee which the railway paid on buses. This leaves only two lines in Salem now served by the railway.

Authorization for Service Between Boston and Worcester. — The Boston & Worcester Street Railway has been granted a certificate of public convenience and necessity to operate motor coaches between Boston and Worcester, Mass.

Bus Reorganization Under Consideration.—The Jamestown Street Railway, Jamestown, N. Y., is planning a reorganization and rerouting of its buses. If the plan does not produce revenue sufficient to warrant the needed replacement of buses now in operation, service will be abandoned. Some time ago the Jamestown Motor Bus Transportation Company, a subsidiary of the Jamestown Street Railway, notified the City Council that it contemplated the abandonment of its bus lines in the city, but no date was set for the discontinuance of service.

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Financial and Corporate

Court Upholds $7,000,000 Easement Allowance at Baltimore

An opinion handed down by Judge Eli Frank in the Circuit Court of Baltimore upholds the Maryland Public Service Commission in placing a valuation of $7,000,000 on the easements of the United Railways & Electric Company, Baltimore, and also upholds the commission in allowing $8,560,210 as "going value" of the railway property. Both these items were included in a recent valuation of the United property fixed by the commission. The total value was $77,000,000.

Clarence W. Miles, formerly people's counsel, took the case into court following the commission's action. The opposition to the "going value" was from William S. Norris, president of the People's Corporation. Judge Frank said:

The easements of the railway are property in the sense that they cannot be taken even for public use without full compensation being paid for them. I have been referred to, and have found no case in which the allowance of a value to easements by the state authorities has been declared improper by the federal courts. It is only where such allowance has been refused and such refusal has been claimed to be confiscatory that its property has been passed upon.

After citing numerous authorities on the various points involved, Judge Frank said that an analogous argument might be made in the case of the United.

"It was the result in 1899 of the consolidation of several corporations, under the provisions of the general corporation law of this state," he said. "The easements of its constituent companies became vested in it. It issued many million dollars of securities, bonds and stocks, upon the faith of its ownership of its tangible property, franchises and easements. These securities have been largely dealt in for more than 26 years on the basis of such ownership."

The court then said:

I cannot reach the conclusion that easements which are real property subject to taxation, of which the owner cannot be deprived without just compensation, which became subject to the liens of its mortgages prior to the enactment of the public service law, upon the ownership of which it has obtained credit and upon the faith of which it sold its securities to the public, is not to be regarded as property upon which it is entitled to earn a fair return. As the valuation made by the commission is *prima facie* evidence of the value of said property in all proceedings before the commission, the importance of the valuation herein involved is apparent.

The valuation of $7,000,000 made by the commission which is now the subject of attack was reached without reference to the earning capacity of the easements so valued. The objection to valuing an easement in a rate base in terms of earnings is self-evident. The greater the earnings, the larger the value of the easement. The greater the value of the easement, the larger the fair return that must be allowed upon such value. While certain authorities regard this situation as conclusive against the inclusion of easements for rate valuation purposes, that result should be reached only where the value of the easement can be determined solely from the earnings of its owner. . . . The special recognition of the easement as taxable property in Maryland, coupled with its assessability without reference to earning capacity, seems to me to justify its treatment by the commission as property for rate-making purposes. I, therefore, approve the order of the commission on this point.

In discussing the petition opposing the $8,560,210 "going value" item, the court says:

It claims as matter of law that no award for going value can be made, that this element of value is already taken care of in the valuation of the tangible property of the company. On the other hand, the railway insists that the allowance made is, as a matter of fact, inadequate. Both of these contentions involve matters of fact. If in fact allowance for going value has been included in the valuation of tangible property, then obviously to value it separately would be a mere duplication which is not permissible. I do not find such to be the fact.

That going value is allowable as a part of the rate basis is determined by ample authority.

Constitutional protection against confiscation does not depend on the source of the money used to purchase the property. That it has been paid for out of past earnings is no ground for refusing a fair return on it.

The fact, therefore, that going value was built up by the expenditure of past earnings furnishes no reason for denying it its reasonable value. In this regard, also, I approve the unanimous conclusion of the commission.

Announcement has been made that the case will be taken to the Court of Appeals of Maryland.

$1,000,000 Price for Alton Properties

An "upset" price of $1,000,000 has been set by United States District Judge Lindley for the sale next month of the physical properties of the Alton Gas & Electric Company and the Alton, Granite & St. Louis Traction Company, referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 15, page 867. The sale was authorized by Judge Lindley to satisfy a mortgage covering the property of the two companies. The total indebtedness of the concerns amounts to about $4,000,000. The price set by Judge Lindley is the lowest bidders will be allowed to offer at the sale to be held in Edwardsville. It is likely that the property will be sold in groups rather than in its entirety.

The lowest prices Judge Lindley authorized on the groups were: $180,000 for interurban electric lines, $270,000 for the Alton city lines, $150,000 for the gas property and $400,000 for the electric property. Thomas Gregory, vice-president of the East St. Louis & Suburban Company, is receiver for both companies.

More Moves in Cincinnati Changes

Frederick W. Hertenstein, president of the Western Bank & Trust Company, and William F. Wiley, general manager of the Cincinnati *Enquirer*, have resigned as directors of the Ohio Traction Company, Cincinnati, Ohio, which formerly operated the electric railway system of Cincinnati under a lease from the Cincinnati Street Railway. The system reverted to the original owners under an agreement reached last November. Messers Hertenstein and Wiley have been succeeded on the board by Theodore H. Schoepf, brother of W. Kesley Schoepf, president of the Ohio Traction Company, and Gustav Weil, a member of the brokerage firm of Weil, Roth & Irving. Committees representing the preferred and common stock holders will meet shortly to decide on a plan of distribution of the assets of the Ohio Traction Company, which ceases to exist as an operating company in view of the recent changes of the traction situation in Cincinnati.

Committee Formed to Protect Auburn-Syracuse Holders

Affairs of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., are reviewed in a statement made by a committee representing the holders of the bonds of the company. The railway was unable to provide funds for the payment of the interest due on April 1, 1926, on its bonds. The committee says that constant effort has been made to offset decreases in earnings through the introduction of economies of every nature in the operation of the road, but that net earnings have gradually been reduced to a point where they are insufficient to pay the annual interest requirements of the bonds. The committee says:

The problems which have been encountered are fundamental. The rapid construction of hard surface roads and the increasing favor with which the bus and the privately owned automobile are regarded as a mode of transportation have combined to make for a falling off of about 15 per cent of the number of passengers carried in the five years ended Dec. 31, 1925. The rates of fare have been increased to 7 cents in Auburn and to 3 cents a mile on the interurban line. Further increases in rates are deemed inadvisable by the management in that they would, in their opinion, work to produce a decrease in traffic which would offset the increased income. Notwithstanding the increase in rates, the establishment of a bus system and the efforts of the management to bring operating expenses to an irreducible minimum, there are constant decreases in passenger traffic and earnings. This is due to the competition from motor vehicles. Furthermore, the constant increase in the mileage of hard surface roads and in the number of automobiles in use in the company's territory would seem to indicate that the present unsatisfactory situation will become more acute in the future.

The gross earnings, net earnings (after operating expenses, maintenances and taxes, but before provision for depreciation), and revenue passengers carried for each of the calendar years 1921 to 1925 follow:

	Gross Earnings	Net Earnings	Revenue Passengers
1921	$636,472	$118,925	3,904,572
1922	583,701	121,139	3,884,721
1923	625,862	116,524	4,137,734
1924	555,440	99,229	3,665,318
1925	509,837	59,575	3,343,573

The annual interest requirement on the bonds, of which there are $1,752,000 outstanding, is $87,600.

The company renders electric railway service in Auburn, N. Y., and between that city and Syracuse, N. Y. The property includes 56.45 miles of track (single-track equivalent) and 44 passenger cars. In addition the company owns an amusement park at Owasca Lake, south of Auburn. Franchises where necessary are satisfactory from a business standpoint. The line between Auburn and Syracuse, a distance of 27 miles, is located for the most part on private right-of-way.

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Deficit in Toledo in April

Operations of the Community Traction Company, Toledo, Ohio, during April resulted in a net deficit of $7,230, it was reported by Commissioner E. L. Graumlich to the street railway board of control at its monthly meeting on May 15. Total revenue was about the same as a year ago, but expenses of additional service, more power and refunds for overcharges to interurbans renting tracks produced an unfavorable result. Passenger revenue showed a gain of $5,449 over April 1925 and totaled $299,575. Revenue passengers totalled 4,275,732 in April, which showed a gain of 1,040 a day over March this year. This is the first time in several years that April has shown better results than March.

The commissioner's report also indicated that the Oak Street bus feeder line, the pioneer in its field, for the first time had shown a surplus over operating expense. The company took over the operation of the line last month with leased equipment and its own operators. Maintenance costs were practically nothing due to the new equipment. Other bus operations showed a loss. A total of 58,101 passengers on feeder buses was carried in April.

$1,301 Balance for Cincinnati Street Railway in April

Operations of buses by the Cincinnati Street Railway, Cincinnati, Ohio, reduced the company's revenue, in so far as the electric railway system was concerned, in April, according to a report filed with Edgar Dow Gilman, Director of Street Railroads and Motor Buses, by Walter A. Draper, president of the railway. The report covers operations for April and shows a decrease over the previous two months. Mr. Draper explained that the loss was not a loss in a direct sense to the company in that the bus operations likely would show sufficient revenue to offset the loss in electric transportation.

The railway has been endeavoring to link up its electric transportation system with its bus lines, and in this rearrangement naturally has incurred expenditures which undoubtedly will be eliminated when the readjustment is completely worked out. The revenue and expenses during April follow:

Operating revenue	$645,464
Operating expenses	465,615
Net operating revenue	$179,848
Taxes	58,221
Operating income	$121,627
Non-operating income	$4,857
Gross income	$126,484
Rental, interest, sinking fund and return on captial	125,182
Balance	$1,301
Revenue passengers	7,559,593
Transfer passengers	2,500,032
Free passengers	117,168
Total passengers carried	10,176,793

Will Operate Line in Ocean City

Upon application of the city of Ocean City, N. J., Chancellor Walker has appointed Robert E. Chew of that place as trustee to operate the Ocean City Electric Railroad, which previous to 1919 operated as a traction corporation at the shore resort. The company, as in the past few years, indicated to the authorities that it would not run its cars, which would mean that the city would be without trolley service. Mr. Chew will be paid $1,500 for his services as trustee in the operation of the line until Dec. 1 next. Twenty-five per cent of the gross receipts may be expended toward the purchase of new equipment. When the trustee concludes the operation of the line he will be required to pay to the company $3,750 for the use of the property. The proceedings were started under the act of 1919, which authorizes fourth class communities to take over the property of traction corporations which have abandoned their railway lines.

Earnings Reported in Grand Rapids

Results for 1925 Considerably Below Allowable Return, but Outlook Very Promising—Interesting Review of the Progress of the Company

BASED on the rates of fare which prevailed throughout the year 1925, viz., 10 cents cash or six tickets for 50 cents, the Grand Rapids Railway, Grand Rapids, Mich., was entitled under its service-at-cost franchse to earn a return of 7¾ per cent on the value of its property, after deduction of operating expenses and taxes and making provision for property retirement. Due largely to the need for operating leased equipment and to delay on the part of the city in carrying out certain work the company's earnings were $172,203 less than the allowable return.

COMPARATIVE STATEMENT OF INCOME AND EXPENSES OF GRAND RAPIDS RAILWAY

Gross Earnings:	1925	1924
Passenger revenue	$1,697,310	$1,719,562
Revenue from special cars, etc.	4,273	2,132
Rent of equipment, tracks, etc.	23,994	38,794
Non-operating revenue	13,200	10,843
Total	$1,738,779	$1,771,332
Operating Expenses and Taxes:		
Operating expenses	1,172,157	1,099,175
Taxes	144,122	137,542
Total	$1,316,279	$1,236,717
Gross income available for fixed charges, retirements and dividends	422,499	534,615
Interest on funded debt	268,248	261,959
Other fixed charges, including amortization of debt discount	55,828	82,768
Provision for retirements	165,963	144,459
Total interest, other fixed Charges and retirements	$490,041	$489,187
Net income	67,541*	45,427
Ratio of operating expenses to gross earnings, per cent	67.93	62.43
Ratio of operating expenses and taxes to gross earnings, per cent	75.70	69.82

* Deficit.

L. J. DeLamarter, vice-president and general manager of the company, explains that the high cost of operating rented cars and their general unfavorable appearance and riding qualities quite naturally affected both passenger riding and operating expenses during the year. Another factor which affected earnings in 1925 was the inability of the city authorities to adopt a definite plan for the widening of Division Avenue, over which several of the main lines of the system operate. This caused delay in laying new rail on this street. In consequence the company was burdened with track maintenance which required an unusual amount of labor and material to keep in operating condition. It is expected that this matter will be settled in the near future, thereby enabling the company to carry out its track renewal plans and so relieve it of the extra maintenance expense caused by present conditions.

In trying to keep pace with the city's growth, meet present day needs by improvements to its property that were imperative and make additions to conform to the public demands the company expended $321,036 during the year. These capital outlays have not only improved the physical condition of the property but, as part of a broad general program, they will enable the company to give a quality of service which will attract added patronage. Mr. DeLamarter says that the cumulative benefit of the expenditures which have been made since Jan. 1, 1922, and which total $1,099,608 over the period 1922-1925 inclusive, is evidenced by the improved condition of the property and in the fact that there is a public appreciation of the company's activities in this respect.

As referred to in the report for the year 1924, the company suffered a heavy loss of equipment in the Hall Street carhouse fire, all of which was covered by insurance. Recognizing the existence of changed conditions in the transportation field, the management decided that rather than proceed immediately with the replacing of its lost cars by others of similar character, the time had come to experiment with an entirely new street care designed better to serve and satisfy the riding public and to encourage increased car riding. As a result, the company carried on during the past year practical tests of three new types of electric rail coaches, embodying advanced ideas. Based on the results of these tests, the company has ordered for delivery in the spring of 1926 27 additional cars, which incorporate the best features of the three test cars. Mr. DeLamarter says:

> Coincident with these tests, a number of improvements were effected in present equipment. Recognizing the general attractiveness of bright color schemes, the company started an extensive car painting and renovating program and has received a great deal of commendation not only locally but nationally because of this work. Interest was further stimulated by naming each car after some local pioneer or person prominent in the development of the city of Grand Rapids. Another development has been the rebuilding of a "Birney" safety car with spring-filled leather upholstered seats and cushions and a smoking compartment. This experiment, if it proves out, will be followed by the rebuilding of additional "Birney" cars.

As a result of a plan of co-operating with the drivers of commercial vehicles, which has cost the company a negligible amount, there is being developed a spirit of helpfulness which is reducing delays due to blocking of tracks and lessening vehicle collisions. A reduction of approximately 23 per cent has been made in the number of col-

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lisions between commercial vehicles and street cars. Accident expense has reduced to less than 2 per cent of the transportation revenue. The company operated 3,674,633 car-miles in 1925 without a fatal accident to passengers or employees.

Despite the fact that the new electric rail coaches are not yet in service and that because of the fire, the company was forced to resort to the use of a number of rented cars, the program as worked out thus far gives promise that the results anticipated will be realized. In this connection it is pointed out that revenue passengers carried during the last quarter of 1925 show an increase over those carried during the corresponding period of the previous year.

A personal solicitation campaign of self-interest among store proprietors along street car routes has been started, and the relation of street car patronage to merchandise sales and the "cash register value" of supporting and talking in favor of the electric railway is being presented. This creates a realization that the use of the merchant's corner by riders waiting for cars brings more business than automobiles passing by or parking blocks away. Time-tables showing the passing time of street cars at particular points are placed on show cases in corner drug stores or other places of business near busy street intersections.

The motor bus service established by the company was improved during the past year. As needs justify, plans will be developed for further adequate bus service. In this connection the buses are operated on a straight 10-cent fare with transfers.

No public financing was done by the company during the year. Of the $368,112.27 insurance money received plus interest on the unexpended balance, there remained on deposit with the trustee as of Dec. 31, 1925, a total of $168,050, the difference having been expended for additions and improvements, including new buildings and car storage facilities on the old Hall Street carhouse site and the purchase of the three experimental electric coaches described in a former paragraph. The purchase of the 27 new coaches was arranged on a satisfactory payment basis.

New High Record for Passengers Carried in Chicago

Traffic on the Chicago Surface Lines is steadily gaining in volume. During April a new high record for the number of passengers carried was established, when the daily average number of rides equaled 4,381,763. The nearest previous approach to this number was reported for February, this year, when 4,331,531 rode daily. The total number of rides during April was 131,542,899, an increase of 5,400,422 over April, 1925.

In connection with the monthly report it is pointed out that during the first four months of this year, there have been 16,621,334 more rides on the surface lines than during the corresponding four months of 1925.

Gross earnings for April were $5,059,784, compared with $5,127,372 in the previous month and $4,838,293 in April of last year. Expenses were substantially reduced in comparison with those for March, but represented increases over the amounts spent in April of last year. Divisible receipts of $308,417 gave the city $169,629 for its 55 per cent interest in earnings and permitted a balance of $138,788 to the companies.

A comparison of the April statement with that for the similar month last year follows:

	1926	1925
Passenger cars, including motor cars	$5,059,784	$4,838,293
Other income	55,799	54,276
Gross earnings	$5,115,583	$4,892,569
Expenses:		
Way and structures and equipment	676,731	591,633
Renewals	409,247	391,405
Power	339,033	315,285
Conducting transportation	2,041,655	1,983,929
Damages	373,843	357,013
Taxes	275,000	255,000
Total operating expenses	$4,115,509	$3,894,266
Residue receipts	$1,000,073	$998,303
Less joint account expenses	20,000	10,000
5 per cent on purchase price	671,656	670,032
Divisible receipts	308,417	318,271
City's 55 per cent	169,629	175,049
Company's 45 per cent	138,788	143,222

Net Income Higher.—For the ten months period ended April 30, 1926, the total operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was $37,084,474, against $35,775,680 for the ten months period ended April 30, 1925. Operating expenses increased from $23,494,442 to $24,158,645. The net income for the ten months of the 1926 period was $4,631,470, against $4,119,290 for the ten months peroid ended April 30, 1925.

Improvements to Be Capitalized.—The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has applied to the Illinois Commerce Commission for authority to issue $1,000,000 of prior lien preferred stock and $1,250,000 of first and refunding bonds. The proceeds will be largely used to reimburse the treasury for expenditures on the new Skokie Valley line, costing about $8,750,000. The extension is about ready to be placed in operation.

Gross Earnings Increase.—For the three months period ended March 31, 1926, the gross earnings of the Indianapolis Street Railway, Indianapolis, Ind., were $1,469,877, compared with $1,431,535 for a similar period ended March 31, 1925. For the month of March, 1926, the gross earnings of $510,006 were approximately $22,000 in excess of the gross for March, 1925. The net earnings showed a decrease of $5,625.

Seeks to Abandon Line.—The Sacramento Northern Railway has applied to the California Railroad Commission for authority to abandon its line of track extending from Park Avenue and Sixteenth Street, in the City of Chico, thence extending into Fifteenth Street, Mulberry Street and to the end of the line. It is stated that the patronage of the line does not warrant the expense of maintaining and operating it. An average of 125 passengers per day only is carried on the line.

Net Income Increases.—The Middlesex & Boston Street Railway, Newtonville, Mass., reports for the quarter ended March 31, 1926, a net of $19,318, after interest and taxes, compared with $17,819 in the corresponding quarter of 1925. Passenger revenues increased from $289,460 to $299,831 and operating expenses from $232,836 to $243,397.

$26,110 for Surplus.—The Stockton Electric Railroad, Stockton, reports to the California Railroad Commission its 1925 operating revenue at $311,761 compared with $311,930 for 1924. The operating expenses, excluding taxes, for 1925 are reported at $267,318 and at $262,282 for 1924, leaving net operating revenue of $44,443 for 1925 and $49,648 for 1924. During 1925 taxes charged to operation amounted to $21,336 and for 1924 to $23,278. Deducting the taxes leaves operating income of $23,107 for 1925 and $26,369 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $26,110 for 1925 and $30,744 for 1924.

Total Earnings in Madison Improve.—Earnings of the railway department of the Madison Railways, Madison, Wis., for the months of March and April were below the average of the corresponding months for the last four years, but the total earnings continue to improve since the institution of city bus service. During March 626,074 railway and bus passengers were carried, against 575,121 in 1925; for the last four-year period the average was 680.487. Gross car and bus revenues in March was $41,808, against $37,548 in 1925; average for the four-year period was $39,744. During April 551,417 bus and railway passengers were carried, compared with 490,017 in April; average for four-year period, 609,802; total earnings during this month were $37,109, against $31,914 last year; average for the four-year period, $35,628.

$1,654,767 Available for Surplus.—The Los Angeles Railway Corporation, operating in Los Angeles, Cal., reported to the Railroad Commission its 1925 operating revenue at $12,852,118, compared with $13,097,425 for 1924. The operating expenses, excluding taxes for 1925 are reported at $10,507,389, and at $9,854,447 for 1924, leaving net operating revenue of $2,344.729 for 1925 and $3,242,978 for 1924. During 1925 taxes charged to operation amounted to $820,315, and for 1924 to $868,054. Deducting the taxes leaves operating income of $1,524,414 for 1925 and $2,374,924 for 1924. Adding to the operating income the non-operating income of the company resulted in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $1,654,767 for 1925 and $2,501,969 for 1924.

Court Sanctions Expenditures.—Judge E. D. Shurtleff in the Winnebago County Circuit Court, Rockford, Ill., has signed an order authorizing Adam Gschwindt, receiver for the Rockford City Traction Company, to sign contracts for material and labor to the extent of $75,000 to complete the work of double-tracking the Seventh Street line. It is considered that the court's action may be the forerunner of authorization to sell real estate to provide the necessary funds.

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Personal Items

E. M. Lunda Is Doing Big Job in Grand Rapids

Introducing a comprehensive system for recording defects in rolling stock and determining individual maintenance costs for each class of equipment are some of the principal tasks before E. M. Lunda, superintendent of shops and equipment of the Grand Rapids Railway, Grand Rapids, Mich. Mr. Lunda, whose appointment to this post was referred to in the ELECTRIC RAILWAY JOURNAL late last year, believes that a comprehensive recording system will assist materially in preventing defects in equipment and in promptly correcting them when they do occur. It is Mr. Lunda's policy to make the Grand Rapids system one of the most modern in the country. In this all-important work he succeeded William Goldner, who was in the employ of the company for approximately 37 years.

Mr. Lunda entered railway work in 1922 in the employ of the Wisconsin Public Service Corporation as engineer of equipment, at which time the interurban lines were changed over to one-man operation. A year later he was appointed master mechanic of the Green Bay Division in charge of equipment and substations. Having proved his worth in this capacity he was appointed general master mechanic of the Wisconsin Public Service Corporation's railway properties in 1924. He resigned on Sept 1, 1925, to accept the position of engineer of equipment with the Grand Rapids Railway.

Mr. Lunda was born in New Glarus, Wis., in 1898. He was graduated from the Janesville High School, and then did three years of general college work at Milton College. Later he entered the University of Wisconsin Engineering College and was graduated in electrical engineering in 1922, specializing in electric railways and central stations.

Change in Personnel in Grand Junction

The new officers of the Grand River Valley Railway, operating between Grand Junction and Fruita, Col., are Clare N. Stannard, president; Guy W. Faller, vice-president; Charles Rump, manager; John E. Loiseau, secretary, and Harry Hughes, treasurer. The company was recently sold by the Penrose-Carlton interests to Henry L. Doherty.

Carl H. Allen, formerly superintendent of the Illinois Traction, Inc., at Ottawa, Ill., was named temporary general manager of the company with headquarters at Joliet. He succeeds F. E. Fisher, who will take several months leave of absence.

A. B. Coryell, general superintendent and purchasing agent of the Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont., has also taken over the duties performed heretofore by the superintendent of way and structures. That office has been abolished.

New General Superintendent of Chicago "L"

Harry G. Hardin has been appointed general superintendent of transportation of the Chicago Rapid Transit Lines, succeeding the late John H. Mallon. Mr. Hardin's promotion to this post comes after 25 years of service with the "L" lines, during the last two of which he has been acting general superintendent.

He joined the "L" organization in 1901 as an extra trainman on the Metropolitan West Side Elevated Railway and worked his way up through various stages of promotion until, at the time of consolidation of the Elevated lines in 1911, he was serving as despatcher at Laramie Avenue on the Garfield Park branch of the Metropolitan.

H. G. Hardin

The same year he was appointed superintendent of transportation of the Chicago & Oak Park Elevated Railroad. He retained this position until 1920, when he was made assistant to the general superintendent of transportation. During 1921 Mr. Hardin served as general superintnedent of the Chicago & Interurban Traction Company, retaining his connections with the Elevated lines.

In 1922 he was made superintendent of transportation of the Chicago Northwestern Elevated Railroad, and the following year assumed similar duties with the South Side Elevated Railroad, holding the two positions simultaneously. He was appointed acting general superintendent of the Chicago Rapid Transit lines in November, 1924.

Mr. Hardin was born in Little Rock, Ill., in 1883. He came to Chicago with his parents in 1887. Previously to joining the "L" organization, Mr. Hardin was connected with the Kellogg Switchboard & Supply Company in Chicago.

Safety Director in New Post

John J. Connors, Who Made Remarkable Record at Nashville, Appointed to Atlanta Post

John J. Connors, safety director of Nashville Railway & Light Company, Nashville, Tenn., since 1923, has been appointed to a similar position with the Georgia Railway & Power Company, Atlanta, Ga. Mr. Connors has been speaking daily for several months before employees of industrial plants in Nashville in the interest of safety and last fall started the Safety Drivers' school at the Chamber of Commerce. He is chairman of the membership committee, electric railway section of the National Safety Council.

Mr. Connors is widely known among electric railway men, but few, perhaps, realize the extent of the experience which he has behind him. No better summary of this experience could perhaps be found than that contained in one of the Nashville papers. Here is the account:

Horatio Alger would have written about "Johnny" Connors and never strayed from fact. The literal romance of this safety expert, who set out at the age of fifteen as a conductor to support a widowed mother and six children, and who rose through the ranks to lead his associate employees to the safety championship of the world, was disclosed by H. A. Davis, superintendent of railway.

Fifteen-year-old Johnny Connors asked the Nashville Railway & Light Company for a job in May, 1903. He was just out of short pants and the conductor's uniform issued to him almost hid him from view. He mounted the rear end of an old Wharf Avenue street car, and one week later took his first pay envelope to his mother and her children. Later he "ran" on the High Street and the West End lines. Years passed, and he became foreman of the carhouse in 1920.

This limited success gave him the idea that he could not be kept down if he could only overcome the handicap of lack of education. He was then working twelve hours a day, but, seized with ambition and determination, he bought books and enrolled in Watkins night school. Five nights of every week he burned oil there. Also he studied his job and the railway industry at large.

In 1923 Mr. Davis called him to the main office and made him safety director. At once he started a school for safety and courtesy, in which all motormen, conductors and other railway and electric power operators enrolled. Regularly, under the tutorship of Mr. Connors, these employees met—to study methods of protecting human life and property and to establish a better relationship between railway men and their riders. Attendance and interest were pronounced. Results were awaited.

In the first year, 1923, street cars operated only two days without any semblance of an accident. They managed to travel 3,750 miles per accident. School "kept," and in 1925 Mr. Connors led his associate operators to the safety record of the world, operating 66 absolutely perfect days and travel-

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ing more than 1,000,000 miles without an accident. The feat has since been heralded throughout the world. In 1926, to date, street cars in Nashville have equaled last year's record for the equivalent period.

W. C. Sparks Leaves Operating Post

W. C. Sparks, for sixteen years vice-president and general manager of the Rockford & Interurban Railway, Rockford, Ill., has resigned as general manager, but will continue with the company as vice-president and a director. It is expected that Adam Gschwindt, receiver for the company, will assume duties of the managership.

Mr. Sparks was graduated from the civil engineering school of the University of Indiana in 1900 and later entered the government service in the Philippines, where he remained for nearly two years. On his return he entered the engineering department of the Union Traction Company of Indiana as chief engineer, but he resigned in 1910 to become general manager of the Rockford & Interurban Railway. In 1916 he was made vice-president.

In 1919 Mr. Sparks was elected president of the Illinois Electric Railway Association. He was also active in the affairs of the Central Electric Railway Association.

George L. Hanscom, for the last 25 years employed by the York Utilities Company, Sanford, Me., in various capacities, has been promoted from assistant superintendent to superintendent.

William Greenwood has become affiliated with the York Utilities Company, Sanford, Me., as master mechanic in charge of shops and power houses. He was formerly with the Westinghouse Electric & Manufacturing Company.

V. Watlington, who acted as managing director of the English Electric Company, during the absence of P. J. Pybus on sick leave, has been appointed managing director of the company.

Obituary

Frank G. Hart, superintendent of transportation for the Bloomington & Normal division of the Illinois Power & Light Company, died on April 21. Mr. Hart entered the service of the old Bloomington & Normal horse car system in 1894. He served with that company continually until 1903. In that year he resigned, but in 1907 he reentered the service under M. G. Linn, then manager of the Bloomington-Normal property, and served under the succeeding managers, D. W. Snyder and E. O. Brown. He was made superintendent of transportation in 1922, following the death of Charles L. Richards, and served in that capacity since then. Mr. Hart was well known throughout the company organization.

William J. Moody, a director of the Corning & Painted Post Street Railway, Corning, N. Y., and the Elmira, Corning & Waverly Railroad, Waverly, N. Y., died on April 26.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Chicago Surface Lines Places Orders for 100 New Cars

The bodies of the 100 new multiple-unit cars being purchased by the Chicago Surface Lines will be built by three companies, deliveries to begin in September. Contract for 34 of them was awarded to the Cummings Car & Coach Company of Paris, Ill., 33 to the J. G. Brill Company of Philadelphia and 33 to the St. Louis Car Company of St. Louis.

The cars are of practically the same design throughout as the 100 multiple-unit cars purchased in 1924 and described in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 15, 1924, page 837. They are designed for multiple-unit operation, giving them the maximum flexibility for train service or single unit two-man or one-man operation. Double-end equipment permits them to be operated on lines having stub terminals. National Pneumatic doors and the interlocking door and car control, automatic exit doors and Safety Car Devices apparatus are used. Their weight complete is 41,000 lb. The contract for motors is divided between General Electric No. 275 and Westinghouse 535, two motors being provided per car. Contracts for principal items of equipment awarded other than those mentioned above are as follows:

Trucks (Stucki side bearings)...J. G. Brill
Wheels .....Illinois Steel Company
Axles .....Carnegie Steel Company
Control equipment.....General Electric
Motors:
  67 cars .....General Electric
  33 cars .....Westinghouse
Door mechanism .....National Pneumatic
Air compressor .....General Electric
Rattan seat equipment.....St. Louis Car
Couplers ..... Ohio Brass Company
Heater equipment ..... Consolidated Car Heating Company
Ventilators .....Railway Utility
Signs .. Electric Service Supplies Company
Single-stroke bell and buzzer equipment.. Consolidated Car Heating Company
Curtains ..... Railway Curtain Company
Registers .....International Register
Thermostat equipment .. Railway Utility
Trolley catchers . Trolley Supply Company
Headlights ..... Trolley Supply Company
Sand traps.....Electric Service Supplies

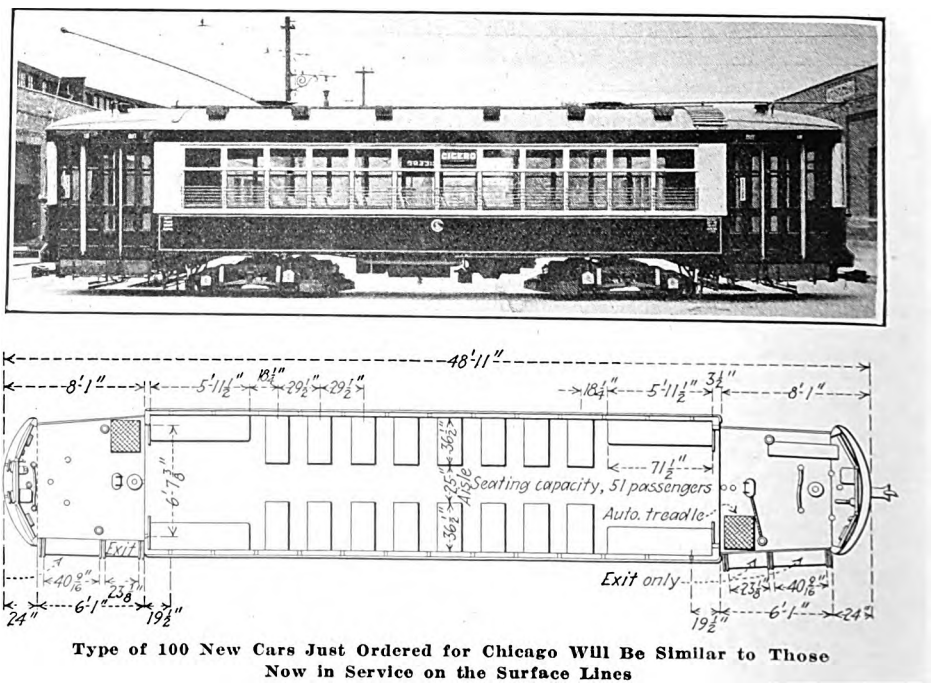
With the delivery of these cars Chicago Surface Lines will have added 445 new cars to its equipment in the past three years. Including this equipment the system will have 3,639 cars, with a total seating capacity of 160,000.

Alliance Specifies Haskelite

Haskelite has been specified for the interior trim on eight passenger interurban cars ordered by the Stark Electric Company, Alliance, Ohio, on March 13 from the Cincinnati Car Company. Specifications on these cars were published in the issue of ELECTRIC RAILWAY JOURNAL for April 17, 1926.

English Electric Anticipates Good Year

No dividends were declared on the ordinary shares of the English Electric Corporation, although profits for the year were £194,953. A reduction of £68,827 out of the earnings of the previous year occurred, this falling off being said by the directors to be occasioned by acute world competition in electrical and mechanical machinery. Unsettled conditions in certain foreign



Type of 100 New Cars Just Ordered for Chicago Will Be Similar to Those Now in Service on the Surface Lines

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markets reduced the volume of foreign orders of the English company.

An improvement has been noticeable in the last few months and the company has booked a much larger volume of business than at any time in the immediate past. The unexecuted orders on its books already exceed the entire output of 1925, it is reported.

Electrification in Italy

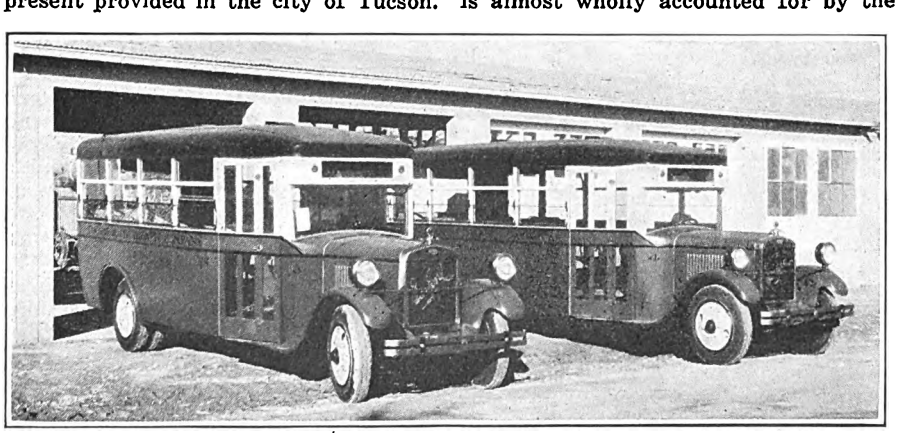
Railway electrification in Italy took another step forward with the opening of the newly electrified railway between Sestri Levante and Spesia. The total length of this improvement is 27 miles, and it marks the final step in the electrification of the line from Modane on the French frontier to Sestri Levante, a distance of 225 miles. It is reported that within a few months electric operation will be extended to Leghorn by the conversion of another section 58 miles in length. At present the total length of electrified line in Italy is 552 miles.

New Gasoline Produced by Texas Company

A "new and better" gasoline has just been announced by the Texas Company. It has been made possible in commercial quantities through the Holmes-Manley process, which is a patented method of refining controlled by the manufacturers. Among the advantages claimed for it are the fact that it vaporizes instead of merely atomizing, because of its higher volatility and freedom from heavy ends, that it is a dry rather than a wet gas and that it provides a quicker start and pickup, more miles per gallon, relief from carbon knock and better lubrication. All Texaco tanks and pumps are now supplied with the new gasoline.

Tucson Gets New Buses

Delivery has just been made of two pay-enter city type buses to the Tucson Rapid Transit Company, Tucson, Ariz. The buses, which were constructed by the Garford Motor Truck Company, Lima, Ohio, are designed to enhance the streamline effect, as practically all body lines have been carried across the doors, as shown in the accompanying illustration. The buses will seat 21 passengers and will augment the coordinated transportation service at present provided in the city of Tucson.



Two 21-Passenger Buses Purchased by Tucson

$14,122,000 Profit for Westinghouse

Sales of $166,008,800 Largest in History of the Company—Five-Year Comparison

The volume of sales billed by the Westinghouse Electric & Manufacturing Company last year shows an increase over the previous year, notwithstanding that the South Philadelphia Works, devoted to the manufacture of large apparatus such as land turbines, condensers, equipment for merchant ships, battleships, cruisers and other naval vessels, was insufficiently loaded with business and operated at a loss for the year. The value of new orders booked during the year also shows a substantial increase over the previous year. After adjustments, the value of unfilled orders at the end of the fiscal year was $55,163,247. A condensed comparative statement of operations for the past five years follows:

	Year Ended March 31				
	1926	1925	1924	1923	1922
Gross earnings—sales billed	$166,006,800	$157,880,292	$154,412,918	$125,166,115	$99,722,026
Cost of sales	151,711,929	144,242,065	137,006,280	111,694,832	93,461,846
Net manufacturing profit	$14,294,861	$13,638,227	$17,406,638	$13,471,283	$6,260,180
Other income	2,295,363	4,203,179	1,336,438	1,296,601	2,673,809
Gross income from all sources	$16,590,224	$17,841,406	$18,743,076	$14,767,884	$8,933,989
Interest charges, etc	2,468,223	2,517,042	2,617,773	2,504,398	3,096,600
Net income available for dividends and other purposes	$14,122,001	$15,324,364	$16,125,303	$12,263,486	$5,837,389

The statement of the profit and loss account follows:

Surplus as of March 31, 1925		$51,199,324
Surplus—George Cutter Company, July 1, 1925		82,764
Net income for the year		14,122,000
Total		$65,404,090
Deductions:		
Dividends:		
On preferred stock	$319,896	
On common stock	9,154,615	
Total dividends	$9,474,511	
Additional reserve for federal taxes—1917–1921	4,000,000	
Miscellaneous—Net	214,182	
Total deductions		13,688,693
Surplus March 31, 1926		$51,715,396

Property and plant account were increased during the year mainly due to the equipment of new buildings erected during the previous year. An increase in investments over the previous year is almost wholly accounted for by the additional capital paid into the Westinghouse Commercial Investment Company and Westinghouse Acceptance Corporation. All of the outstanding capital stocks of these companies are owned by the Westinghouse Electric & Manufacturing Company, but because of the nature of their business, their operations are not included in the Westinghouse report.

The Westinghouse Commercial Investment Company was incorporated for the purpose of increasing the distribution of Westinghouse products by supplementing its system of distributing agents with its own jobbing houses advantageously located throughout the United States. The Investment company declared a dividend of 6 per cent on its capital stock as of Dec. 31, 1925.

The Westinghouse Acceptance Corporation was created to assist Westinghouse distributing agents and users of Westinghouse products, by financing sales on the installment plan. The Acceptance Corporation operates on a basis similar to that of other financing corporations and has already proved of valuable assistance in securing business. It has been in operation less than a year and satisfactory profits are anticipated.

The export business of the Westinghouse company, excepting for Canada, is conducted through the Westinghouse Electric International Company. Final settlement was received during the year on the contract for the electrification of the Chilean State Railways from Santiago to Valparaiso. According to Chairman Tripp competition in foreign markets continues to be keen and the outlook for the ensuing year shows no marked change.

The average number of employees during the year was 46,427. The total of all payrolls for the year was $74,144,607, equal to about 49 per cent of the cost of sales billed.

Metal, Coal and Material Prices

Metals—New York	May 18, 1926
Copper, electrolytic, cents per lb	13.875
Copper wire, cents per lb	16.00
Lead, cents per lb	7.75
Zinc, cents per lb	7.22
Tin, Straits, cents per lb	61.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.875
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.70
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago, net prices, without bags	2.10
Linseed oil (5-bbl. lots), N.Y., cents per lb.	11.20
White lead in oil (100-lb. keg), N. Y., cents per lb	15.00
Turpentine (bbl. lots), N. Y., per gal	$0.86

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Rolling Stock

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been recommended by the Railroad Commission to purchase 70 or 75 additional cars for use in that city to augment present service.

Wilkes-Barre Railway, Wilkes-Barre, Pa., has placed an order with the J. G. Brill Company, Philadelphia, Pa., for ten 30-ft. 11½-in. closed motor cars mounted on Brill 177-E-1 trucks.

Dallas Railway, Dallas, Tex., has placed an order with the American Car Company for 30 45-ft. 8-in. double-end motor cars mounted on Brill 177-E-1 trucks.

Aurora, Elgin & Fox River Electric Company, Aurora, Ill., expects delivery in August of eight double-end, single-truck, safety cars ordered from the St. Louis Car Company on April 23. These cars are to be of steel construction and will seat 32 passengers. Some of the principal specifications are given here:

Weight:	
Car body	8,200 lb.
Trucks	4,500 lb.
Equipment	5,250 lb.
Total	18,050 lb.
Length over all	28 ft. 0 in.
Truck wheelbase	8 ft. 0 in.
Width over all	7 ft. 9⅛ in.
Height, rail to trolley base	9 ft. 10⅛ in.
Body	Steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air Brakes	Westinghouse
Axles	Heat-treated
Bumpers	Channel, 5 in.
Car signal system	Faraday
Car trimmings	Polished bronze
Compressors	Westinghouse
Control	K-63 double end
Couplers	St. Louis Car Company draw bar
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	St. Louis Car Company
Fare boxes	Cleveland No. 5
Fenders	St. Louis Car Company
Gears and pinions	General Electric
Hand brakes	St. Louis Car Company drop handle
Heater equipment	Consolidated Car Heating
Headlights	Golden Glow S. M. 95
Journal boxes	St. Louis Car Company
Lightning arresters	G. E. aluminum cell
Motors	Two-G.E. 265-A, 35 hp., inside hung
Sanders	St. Louis Car Company "Weather-proof"
Sash fixtures	St. Louis Car Company
Seats	St. Louis Car Company R-50, reversible
Seating material	Genuine leather
Slack adjuster	St. Louis Car Company screw type
Springs	St. Louis compound heli-elliptic
Step treads	Feralun
Trolley catchers	Keystone
Trolley base	General Electric
Trolley wheels	General Electric
Trucks	St. Louis Car Company No. 7
Ventilators	St. Louis Car Company, "Peerless"
Wheels	26-in. diameter rolled steel
Special devices, etc.	Root track scrapers

British Columbia Electric Railway, Vancouver, B. C., has ordered two four-cylinder parlor car chassis from the Fageol Motors Company of California.

Southern Indiana Gas & Electric Company, Evansville, Ind., will spend $175,000 for thirteen new large high-speed cars which will be delivered and ready for use by Oct. 1. The new units will be of the latest type safety cars. Six are designated as light-weight double-end double-truck cars. To defray the expense of the new equipment the company has been granted permission by the Indiana Public Service Commission to issue $750,000 of 6.6 per cent preferred stock.

Los Angeles Motor Bus Company, a subsidiary of the Los Angeles Railway and the Pacific Electric Railway, has placed an order for six double-deck buses with the Fageol Motors Company, Oakland, Cal. Delivery of the new unit is expected to be made shortly.

Birmingham Electric Company, Birmingham, Ala., has just purchased sixteen new electric street cars of the most modern design for its lines in Birmingham, at a total cost of $250,000. The cars are expected to be delivered about Oct. 1, 1926. Each of these cars has a seating capacity of 62 passengers. According to General Manager Pevear new cars will be practically the same as those now in use on the East Lake and South East Lake lines, having the large side-door entrance and front exit, and many new features including standard safety devices. Heavy upholstered seats and full spring cushions have been specified. Noiseless gears and motors will be in use and rubber-tiled floors are included in the detailed specifications.

Northern Ohio Traction & Light Company, Akron, Ohio, has just received one Differential car from the Differential Steet Car Company of Findlay, Ohio. This is a trail car and will be used on trackwork and for cinder service.

Municipal Railway of St. Petersburg, St. Petersburg, Fla., has included in an improvement program eight new double-truck cars at a cost of $100,000. The new cars are to be of the same size as the largest of those now in use. This is a further expenditure of bond moneys provided for betterments in public utilities by the electors who sanctioned an issue of more than $200,000 last November.

Track and Line

Sioux City Service Company, Sioux City, Iowa, has started to relay new street car rails on Dubuque Street between Seventh and Eleventh Street. Work is being done at this season because the city has decided to pave the street. The new rails will be laid in a concrete monolithic base.

Pacific Northwest Traction Company, Everett, Wash., plans the construction of an overhead crossing on the North Trunk road, a link in the new Pacific Highway between Ronald and Foy Stations. The company will ask for alternative bids on a steel girder span and frame truss. The new trestle will be 125 ft. long and have a clearance of 14 ft. over interurban rails. Plans also include concrete abutments.

Power Houses, Shops and Buildings

New York Rapid Transit Corporation, Brooklyn, N. Y., operating subsidiary of the Brooklyn-Manhattan Transit Corporation, is inquiring for 25 cranes for its Coney Island shops.

Georgia Railway & Power Company, Atlanta, Ga., has obtained a permit for the construction of a new carhouse in Atlanta, at a cost of $90,000. The building will be of brick and concrete with metal roof. Construction will start immediately.

Trade Notes

Graybar Electric Company, New York, N. Y., has announced the opening of three additional distributing branches to be located in the following cities: Reading, Pa.; Dayton, Ohio, and Hartford, Conn. It is expected that these new branches will be in operation this spring.

Timken Roller Bearing Service & Sales Company, has announced the closing of its Baltimore, Md., office, formerly located at 33 Cathedral Street. The service requirements of Timken customers in this territory will be supplied through the Richmond, Pittsburgh and Philadelphia branches hereafter.

E. Hamilton Berry, manager of the electric railway department of the Philip Carey Manufacturing Company, Cincinnati, Ohio, has resigned from that office. He has held this position since November, 1925, and prior to that time was engineer of maintenance of way Cincinnati Traction Company for many years.

Fred T. Rumball, formerly manager of the Kansas City branch of Timken Roller Bearing Service & Sales Company, has been promoted to the position of sales engineer, automotive division, of the Timken Roller Rearing Company. Mr. Rumball will have his headquarters in Cleveland, with Edgeley W. Austin, assistant manager of sales. The position of branch manager at Kansas City will be filled by J. M. Carey, who has been promoted from the position of salesman under Mr. Rumball.

Charles E. Parsons has recently been made general sales manager of the Auto Body Company, Lansing, Mich. Mr. Parsons has had long experience in the automotive industry, having served for many years with the Fisher Body Corporation and later becoming vice-president of the Ternstedt Manufacturing Company.

Henry Eggelhos was recently appointed exclusive representative for the eastern half of Texas by the Uehling Instrument Company of Paterson, N. J. Mr. Eggelhos' address is P. O. Box 945, Dallas, Tex.

New Advertising Literature

Nichols-Lintern Universal Lanterns is the title of a booklet recently issued by the Nichols-Lintern Company, Cleveland, Ohio. This booklet contains a complete description of the N-L industrial lanterns and illuminated signs, rapidly coming into wide use in steel mills, factories and electric railways.

Carnegie Steel Company, Pittsburgh, Pa., has issued a booklet which contains complete information, life and cost data and illustrations of Carnegie steel cross ties. The booklet states that these ties are suitable for electric and steam railways, mines, quarries, plantations and portable tracks.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

CORNELL UNIVERSITY LIBRARY JUN 1 1926 ITHACA, N. Y.

Volume 67 New York, Saturday, May 29, 1926 *Number* 22

Car Design Gets a Forward Impetus

PRINCIPAL features of the new cars developed by Grand Rapids are presented elsewhere in this issue. These are the outgrowth of the ideas incorporated in three sample cars submitted by competitive builders last spring. The cars which are being delivered include what were considered the best elements of the sample cars.

In this effort to stimulate the improvement of cars, Grand Rapids has rendered a notable service to the industry. Mr. DeLamarter believes that street cars can be made attractive to passengers and a credit to the city in which they are operated. There is unmistakable evidence in these latest cars of the possibilities in this direction.

Neither Mr. DeLamarter nor the JOURNAL believes that they represent the ultimate in design. Development of the automobile did not take place in a single model or in the mind of any one individual. It has been the result of collective thinking and collective experience. Primary significance attaches to the Grand Rapids cars not as an ultimate design but as a definite step beyond the bounds of precedent. If the net result is merely to stimulate a more general effort to improve the street car as a transportation merchandising agency Mr. DeLamarter's strenuous efforts in the face of many obstacles and some skepticism will prove of invaluable service to the industry.

British Transport Workers Find They Are Not Indispensable

DOGGED determination to see it through at whatever cost of personal comfort and convenience enabled the British public to win a real victory in the recent general strike. Rudyard Kipling, who has put the psychology of his fellow countrymen into words as few other writers ever have done, tells:

> How in all time of our distress
> And our deliverance too,
> The game is more than the player of the game
> And the ship is more than the crew.

Although written years ago, these lines epitomize exactly the spirit that broke the general strike. It was the realization that "the ship is more than the crew" that impelled Tom, Dick and Harry to keep the wheels turning when the regular workers quit.

At this distance, it is impossible to evaluate accurately the merits of the controversy between the British coal miners and the mine owners; nevertheless, it is sufficiently clear that the attempt to paralyze the life of the nation by calling a general strike, including public service employees, was not the way to settle the coal question. Grave fears were entertained in many well-informed quarters, however, that this effort might succeed to the point of forcing some concession from the government. But the trades union officials apparently misjudged the temper of the British public. The ordinary, easy-going citizen got mad and upset the plans of the labor leaders.

Volunteer workers were instrumental in restoring the transportation services promptly, as told in a news article from the London correspondent of ELECTRIC RAILWAY JOURNAL, and published elsewhere in this issue. While these volunteers undertook to operate to some extent the tramways rapid transit lines, and steam railroads, it was in the field of bus operation that they were most successful. A large part of the London traffic normally is carried by bus, and it was found possible by the combined efforts of the independents and experienced automobile drivers hastily converted into bus drivers, to provide a surprisingly effective transportation service. Private motor cars also carried many thousands of people. Conditions generally similar to those in London prevailed also in the smaller cities.

Thus the British transport workers discovered that they were not indispensable. The public, greatly irritated by the attitude of the unions, determined to break the general strike and found they could do it. The experiment and its outcome taught a lesson that will long be remembered.

Failure of Interstate Bus Lines Points to Need of Regulation

LACK of interstate bus regulation has encouraged operators in many instances to undertake a type of service which the bus is not fitted to perform. Recent developments in the field of New York-New Jersey operation furnish convincing evidence of this. Traffic checks show only 24 lines now in operation, carrying some 6,000 passengers a day, as compared with 30 lines carrying about 9,000 daily passengers a month ago. Altogether nearly half the routes that were in operation at one time or another have been discontinued.

Suspension of service on these bus lines is due to their failure to attract as much patronage as was expected. The total volume of interstate traffic in this territory is enough to support many times the number of buses which have been engaged in such operation. The bus service, however, has been not only less regular than the rail service but also considerably more expensive. The slow crossing of the Hudson River on ferryboats crowded with other vehicles has been a serious obstacle to successful operation. Traffic congestion in New York City has been another difficulty.

On account of these conditions only a small part of the rail traffic has been taken away—not enough to support the hundreds of buses which rushed into the business. The weaker operators have been forced to the wall, and in a number of instances the dealers have replevined the buses for failure to make purchase payments. Many operators still continue, and in some

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cases probably are filling a real transportation need. By providing through service without change of vehicle from certain suburban communities to the shopping district of New York City the buses supply a type of transportation which the rail carriers cannot offer. The extent of the demand for such service at the price which must be charged for it is problematical. Judging by the present trend of events it appears that the peak of this kind of operation has passed.

However, it would be a grave mistake to assume that because there has been some improvement in this particular situation the whole problem will work itself out satisfactorily without official regulation. In the North Jersey area the rail carriers are in a strong position and have not been seriously affected by the competition. This is not true in every locality where interstate bus operation has been undertaken, and protection of the rail carriers is undoubtedly necessary in many cases. Moreover, needless duplication of facilities is bound eventually to increase the price of transportation and proper regulation is needed to protect the interest of the public in this regard. Responsible bus operators themselves would profit from regulation, which would prevent overcrowding of those routes where an opportunity exists to furnish service that is really needed. From every point of view the sooner that proper regulation is secured the better it will be for everybody.

Amateur Engineering Is Dangerous as a Basis for Spending $4,000,000

CALLING the report of Seattle's Rapid Transit Committee a layman's report is perhaps the kindest thing that can be said. It is a noble effort but fraught with the pitfalls that lie in the wake of such attempts on the part of the uninitiated in technical matters. The "findings and recommendations" included in this report to the City Planning Commission are abstracted elsewhere in this issue.

Seattle has had a hard time with its transportation. Its surface lines were dragged down for years by political barterers while under Stone & Webster management, and now as a municipal proposition it has been almost sunk to oblivion. Costs have mounted under city management and revenues have steadily decreased. Now a new idea develops. Because the municipal operation has failed, as is maintained in the report, the committee finds that a combination subway-elevated system of rapid transit is necessary.

No brief is held by this paper for or against the necessity of such a system, but the methods of arriving at the conclusion in the report in favor of it, founded on the variegated and somewhat heterogeneous nature of the material, would lead one to doubt the value of the findings, whether they were for or against the object of the investigation. Certainly the finding by the committee that a rapid transit scheme was desirable because of the advertising value to the city will make cold beads of perspiration stand out on the brows of those who have lived through the early financing of some existing operations.

The industry has trouble enough to solve the problems confronting it, even with the use of the best talent available, without being embarrassed with projects that liken themselves to the old stanza, "I shot an arrow in the air, it fell to earth I know not where." The report is colored with quotations from men well known in the industry, such as Frank Sprague, Roger W. Babson, John Beeler and Edward W. Bemis. None of these men has reported on the Seattle situation, but the quotations and comparisons are drawn from public reports or testimony given in connection with investigations in other cities or from correspondence. Such scattered statements are interpreted in the report to have a bearing on the Seattle situation.

Probably the committee was vested with the authority to make a report without being allowed an appropriation for the work involved. If this be the case, more respect would have been forthcoming if the committee had recommended that an engineering investigation be made rather than produce the superficial report that, wrongly used, may cause incalculable harm.

Neither Seattle nor the industry can afford amateur play with its transportation.

Present Expediency May Endanger the Future

NEWS of the consummation by the Fifth Avenue Coach Company of an agreement to buy the New York Railways as a step in bringing about the establishment of a comprehensive bus system in Manhattan has again aroused general interest in the popular subject of bus versus street car in that city.

There are some phases of this latest move that may well be given attention by local transportation men in other cities, in order that the facts and the conditions surrounding the New York developments may be properly interpreted and in order that the wholesale drawing of general conclusions from a most specialized set of premises may be avoided.

It may be well to reiterate here that ELECTRIC RAILWAY JOURNAL is a hearty advocate of the bus as a valuable transportation tool. It is interested primarily in the development of the local transportation industry and has no fetish of sentiment or precedent in favor of any one vehicle over another. It believes that the bus makes possible a broader field for common carrier passenger business instead of foreshadowing the passing of the street car as a mass transportation agency; that the successful exploitation of this broadened field depends on the establishment with the bus of a higher grade form of common carrier transportation at proportionately higher rates of fare.

One outstanding fact characterizes all of the various proposals to substitute buses for cars in New York. There is in the whole situation a primary motive of expediency. Some of the trolley lines which it has been proposed to remove have proved unprofitable. Others have been more or less profitable. But the significant fact is that these results have been obtained under conditions peculiar to operation in New York. These have been both political and physical. Under the former classification falls the 5-cent fare; under the latter is the expensive conduit slot contact system which the railways in Manhattan are required to use. There is also no apparent effort in New York through traffic regulations to expedite movement of street cars.

In the sense that the proposal to substitute buses for certain rail lines offers a means of surmounting these obstacles which have retarded transportation improvement in Manhattan for years, the proposal may prove to be a wise one. But in the sense that it makes of the bus a mass transportation vehicle rather than a preferred service vehicle it is open to question. Worthy of note in this connection is the fact that there is no intimation in any of the various proposals which

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P.R.T. Plans to Carry 62,000 an Hour at the Sesqui-Centennial

Public Transportation to the Exposition Grounds and Inside Will Be Cared for by the Philadelphia Rapid Transit Company—Information Booths Established Throughout the Grounds and in the City — Approximately $2,000,000 Has Been Expended by the Company in Preparation, 90 per Cent of Which Is a Permanent Outlay

By Edwin F. Thayer
Assistant Editor ELECTRIC RAILWAY JOURNAL

Airplane View Taken Several Weeks Ago, Looking to the Northwest

The stadium is pictured in the immediate foreground, while the auditorium, located just to the west of Broad Street, may be seen in the upper right hand corner. Pattison Avenue (east and west) bisects the middle of the picture and the construction work on the main loading terminal is shown under way at the extreme right. The "Gladway" for amusement concessions is in the open space at the upper center, while to the left center may be seen the India Building and the Street of '76.

FROM a pictorial standpoint the Sesqui-Centennial Exposition, opening on May 31 in Philadelphia, holds much of interest. But from a transportation standpoint it perhaps offers even more to stimulate the fancy of a railway man. When one turns over in his mind the thought that the numbers of visitors who are expected to come to Philadelphia are variously estimated at from 65,000 to 150,000 per day, it becomes evident that the conveying of these crowds to and from the exposition grounds will prove no small task. Furthermore, the visitors must be transported in addition to Philadelphia's regular heavy traffic and over streets congested with thousands of private automobiles.

The fame of the Sesqui-Centennial has been heralded to the Antipodes. This colorful drama is expected to draw millions of visitors from every corner of the country and from every section of the world during the six months of its history. Buildings of imposing size and elaborate decoration constitute the physical plant that has been erected at great expense. In the southeastern corner is a mighty stadium, capable of seating 100,000 spectators and of accommodating many thousand additional standees. There is also a large auditorium that will seat 20,000 people. These two structures will handle most of the important events that the exposition will boast, but in addition there will be countless other attractions to lure the visitor to the grounds.

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Had the exposition been located in West Philadelphia, rather than to the south of the city, a large portion of the traffic problem might have been eliminated, for automobiles entering the environs of the city from the north or west and destined for the exposition grounds might have found ingress without having to traverse the main business district and the principal transportation arteries. With the present location practically every vehicle must pass through the center of the city and south along Broad Street or one of the adjacent thoroughfares, and it is over these identical streets that the Philadelphia Rapid Transit Company must operate its exposition cars and buses.

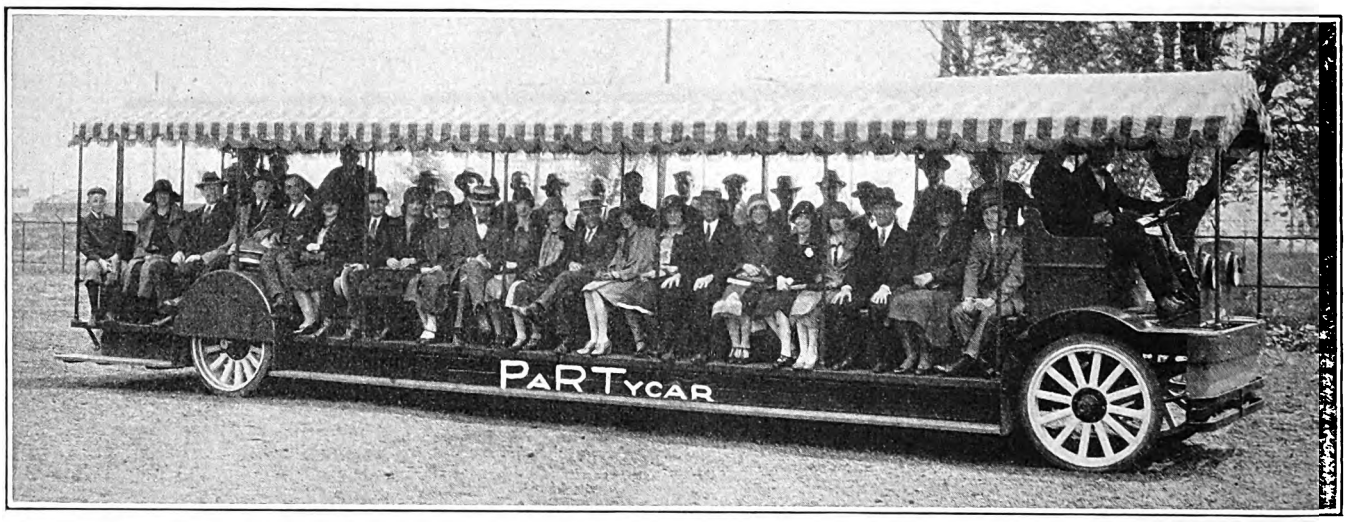
How to meet the great difficulties thrust in their path by this condition has been puzzling P.R.T. officials for several months. It required no major prophet to foresee many and many an exasperating traffic tie-up during the course of the exposition period, and the knowledge that these tie-ups would be due to conditions beyond their control, rather than to inadequate equipment, provided little comfort.

Full co-operation has been received from the city and Sesqui officials in scheduling exposition feature events so that peak hours for exposition crowds would not fall at hours when the regular city transportation is at its height. In other words, a big event which has been in progress in the stadium during the afternoon will be continued until after the downtown peak hour has passed or will be resumed again in the early evening. Thus two birds will be killed with a single stone, for the crowds will be kept off the downtown streets and the revenue of food venders on the grounds will be materially increased.

An outlay of approximately $2,000,000 is being made by the local railway company in providing tracks, loading terminals, intramural bus equipment (for transportation within the exposition grounds) and miscellaneous equipment which will serve directly in accommodating the city's guests. In addition 50 street cars and 135 new buses have been ordered. These are to be used in supplementing the present rolling stock in use in Philadelphia and environs and in providing adequate service for the Sesqui-Centennial. Of the $2,000,000 expenditure approximately 90 per cent will constitute a permanent outlay, for practically all of the track being laid on Seventh and Tenth Streets and on various east-and-west streets in the vicinity of the grounds will be left to serve the stadium, after the exposition proper is a thing of the past. It is probable that all loading stations, other than the main one at the Pattison Avenue entrance, will eventually be abandoned and the tracks at those points relaid for through service.

Throughout the summer and fall months a host of important spectacles have been scheduled for the stadium and auditorium on the grounds. To meet the heavy peak conditions which these events will occasion, the railway has available street car and bus equipment which will be able to handle approximately 62,000 persons per hour. Of this total, 52,000 will be cared for on the several street car lines leading to the grounds, while the remaining 10,000 will be carried by bus to the various bus terminals located in the vicinity of the exposition.

To date it has not been possible definitely to determine just what the bus routes will be, although it is known that all buses will follow a single general route to the vicinity of the grounds and will there be directed to the various loading stations.



Intramural Bus Equipment to Be Used Within the Exposition Grounds

The tracks on Broad Street, which previously served the League Island Navy Yard, have been abandoned. They bisect the exposition grounds and it was desired to keep all forms of transportation, other than the intramural buses, out of the area set aside for the exposition. Now the Navy Yard is being served by tracks laid on Eleventh Street south from the Pattison Avenue trolley terminal and bordering the stadium grounds.

Cars are in operation over the tracks on Tenth Street at the present time, but the Seventh Street line will not be completed for several weeks, due to the great delay in getting under way with the street opening projects. The railway has been close on the heels of the city with its track-laying gangs ever since the street opening began, laying track almost before the grading had been finished. The city has been doing all of the grading work and has supplied the sub-grade and carried on the paving work. The company has been responsible for the laying of its tracks and for erecting the overhead line.

Due to the difficulty experienced in obtaining crushed rock for grading and ballasting purposes it has been

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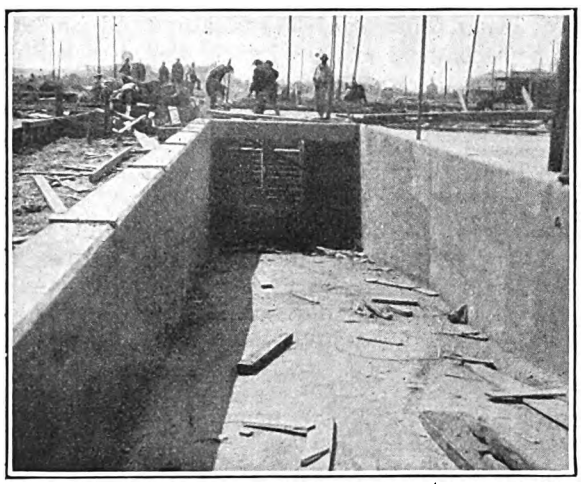
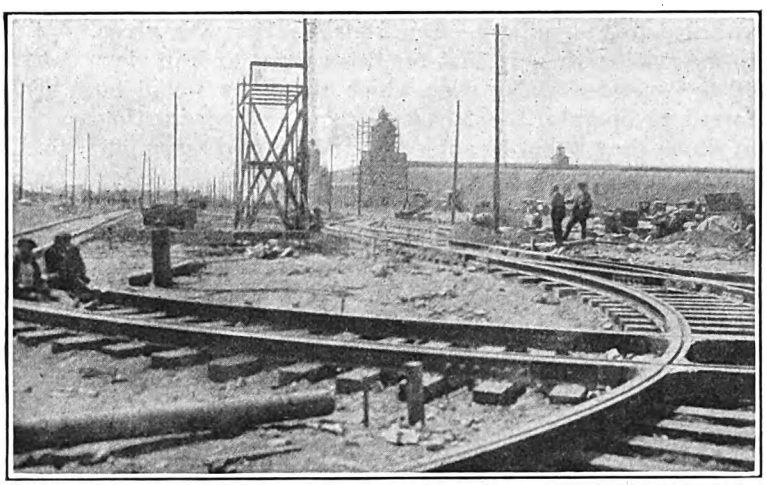




At Left, One of the Inclined Ramps Leading to the Pattison Avenue Loading Platforms. At Right, Some of the Special Trackwork at the Pattison Avenue Terminal

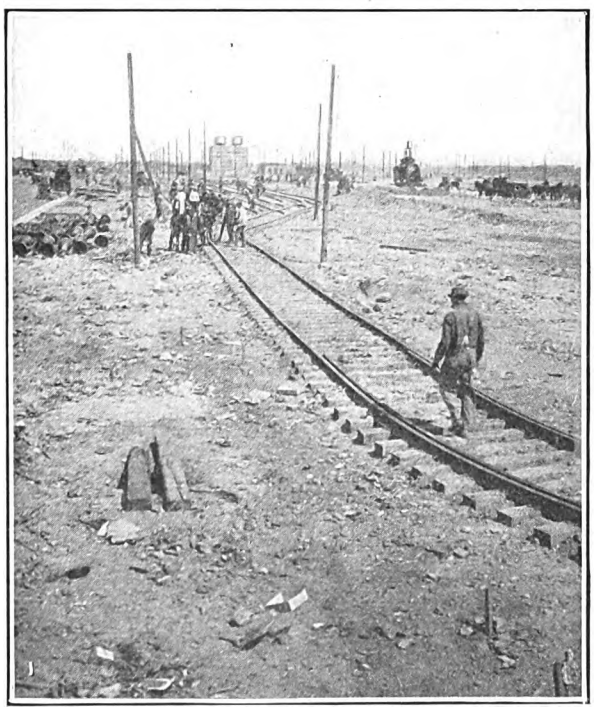
found necessary to use almost any material which came to hand. Furthermore, although intended to be permanent in nature, it was necessary to lay track over a sub-grade which had not been given time to settle properly and early rehabilitation expense is anticipated.

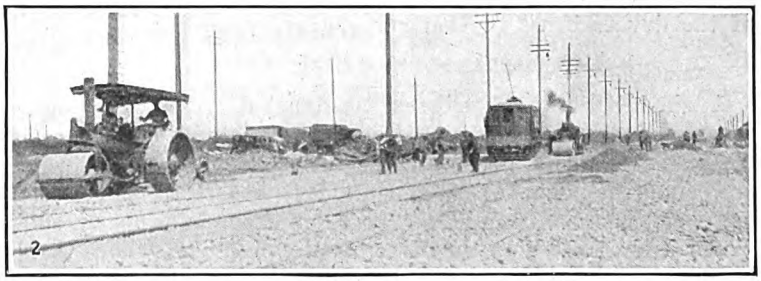
The main Pattison Avenue terminal is equipped with four concrete loading platforms and is capable of accommodating sixteen Tenth Street cars simultaneously. Passengers will reach these platforms by an underground passageway with ramps leading up to each. Between this terminal and the loading platform at Pattison Avenue and Broad Street, which will handle six Seventh Street cars simultaneously, storage tracks will make it possible to keep a reserve of 170 cars available to handle large crowds assembled for feature events in the stadium or elsewhere in the grounds. Some cars on Tenth Street will of course be operated for through service to the Navy Yard.

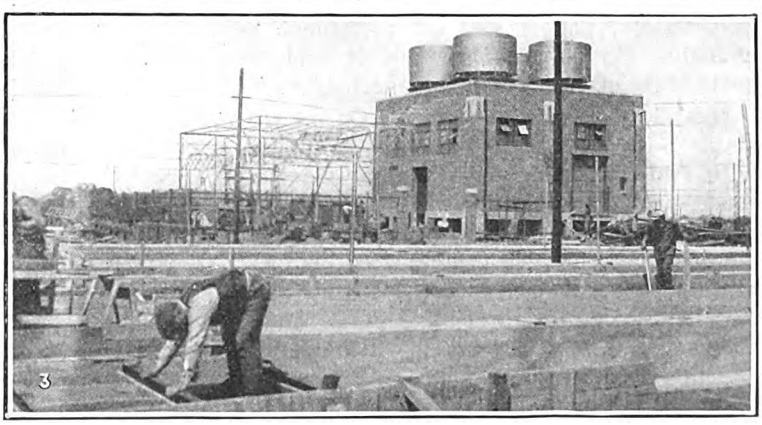
None of the loading platforms and terminals will be covered, as from the standpoint of economy it did not seem advisable to make this additional outlay. Furthermore, the lack of time made it essential to concentrate every effort on matters of more fundamental importance.

From the standpoint of the company, the Pattison Avenue entrance to the grounds will be the most important one. While the so-called main entrance is located at Broad Street, between the Auditorium and the Palace of Liberal Arts and Manufactures, the events which will attract the largest crowds will probably be those held in the stadium, and the Pattison terminals will handle most of that peak traffic. Additional loading stations have been constructed at Pollock and Marvine Streets and just west of Broad Street. These stations will handle visitors destined for or coming from the Broad Street entrance to the grounds.

An exclusive concession to handle all public transportation within the exposition grounds has been







Work Being Rushed on the Trackage Which Will Handle Street Cars in the Vicinity of the Grounds

1. Construction of the storage tracks at Pattison Avenue. These will accommodate a reserve of 170 cars.
2. Laying four lines of track on Pattison Avenue to care for the Tenth and Seventh Streets traffic.
3. Construction work on the Pattison Avenue terminal loading platforms. The substation to provide energy for the railway lines and for general exposition purposes is shown in the background. The substation has a capacity of 4,000 kw.

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awarded to the railway. Due consideration was given to the matter of equipment for this service and, in view of the crowded walks over which the units would be forced to operate, the frequent stopping and starting to which they would be subjected and the necessary low speed of operation, it was decided to use storage-battery equipment. Twenty-five standard Commercial Truck chassis were purchased. Special bodies for these were built by the J. G. Brill Company of Philadelphia. Originally it had been intended to use a much lower chassis, but it was found that the type of uneven roadway over which the buses were to be operated would not permit. Furthermore, the Commercial Truck chassis may be converted for regular trucking service when the exposition is over.

The bodies of the present equipment give the impression of long and rakish lines, however. Longitudinal seats facing outward and with a runway down the center of the bus and between their backs are provided. These extend from the front to the rear fenders, and seats for two additional passengers are provided over each of the rear fenders. The conductor passes up and down the center runway for purposes of fare collection. The heads of the passengers are protected from the beating sun by a gaily striped canopy. The bodies of the buses are painted with the conventional P.R.T. colors—green and cream yellow—while the operators and conductors are uniformed in a distinctive Sesqui-Centennial apparel. The buses have been nicknamed "PaRTycars."

The buses are 33 ft. in length, the distance from running board to the street is 7 in., the over-all width is 90 in. and the over-all wheelbase is 24 ft. The Philco batteries used in the buses give a fifteen-hour operating period with intermediate boosting service. As it is impossible to remove the batteries for charging, due to the special body construction, it was necessary to arrange for this system of boosting, which would permit of bringing the units into the charging headquarters at intervals during the less-busy hours of the day to boost the battery charge somewhat.

Intramural Service Building

A shed has therefore been constructed which will accommodate six buses for booster service and general maintenance. This plant and the office for the receiver and superintendent of this equipment constitute the only structures within the exposition grounds proper which are allocated to the intramural equipment. The building contains two generators of 100 kw. and 125 kw. respectively, panels and all equipment necessary for charging the buses. Provision is made to charge the entire fleet of 25 units simultaneously.

Dual 5-in. pneumatic tires are on the rear wheels and single 5-in. tires on the front. Each bus is equipped with two motors driving the rear wheels by means of concentric gearing. They have a maximum speed of 8 m.p.h. and an average speed of 6 m.p.h. The front wheels are adequately protected by bumpers. A Northeaster non-shrill horn is used, as it is desired to warn, rather than to frighten, the dense masses of pedestrians with which the buses will be forced to contend.

The operators and conductors are new men, specially employed for the period of the exposition. They are largely students who are experienced in handling automobiles and who have been specially trained for these unusually long buses. The entire force for the intramural buses consists of 65 operators and conductors, seven mechanical men to handle the shop equipment, a receiver, a clerk, and a supervisor.

Final determination of the routes within the grounds to be served by the intramural buses has not been made even today. Decision on this point will be influenced by traffic conditions as they develop, by the degree of popularity which is accorded to the equipment and by various other local conditions. Cash fares of 10 cents will be collected universally and no transfers will be issued. It is the hope of P.R.T. to be able to break even on this intramural venture—as a money-making undertaking it has never seemed feasible.

Information Service Provided by P.R.T.

Seven information booths have been erected at strategic points in the exposition grounds by P.R.T. These booths are manned by expert information men who have been in the service for years. In addition P.R.T. is training a force of men for service at large conventions, it being planned to have a man specially detailed to be present at conventions held in the city to supply all types of transportation information to the delegates. One man will be located at the Baltimore & Ohio Railroad Station to furnish information, and there will be a man working in the city hall square in conjunction with Sesqui-Centennial Housing Accommodations, Inc. This organization has the exclusive housing concession in Philadelphia during the exposition period and has undertaken to supply every visitor who requests a room with the type of lodgings that he desires. The P.R.T. information man will be on hand to direct the stranger to his portal for the night. The Housing Corporation will have representatives in every department store, and thus P.R.T. will be in touch, indirectly, with these bureaus.

All in all, more than 25 railway men will be engaged in this type of service. This number includes a highly-skilled man who will be constantly on duty at the general switchboard in the central information office. He will answer questions phoned in, either by the public or by the field information men who have been stumped by some particularly knotty question. While this service will indirectly work to the benefit of the street car company, it is a real contribution to the success of the exposition as a whole, for the information men will be expected to answer thousands of questions that have absolutely no bearing upon matters of transportation. Copies of the special Sesqui-Centennial edition of *P.R.T. Traveler* will be on sale at all of the branch information offices of the company and will also be supplied by conductors and subway-elevated cashiers.

Various estimates place the total expected attendance at the Sesqui-Centennial at between 25,000,000 and 35,000,000. Great haste has of necessity prevailed in laying some 6 miles of track, erecting terminals, employees' waiting rooms, information booths, and a substation, and in perfecting the general operating plan for the exposition period to handle the expected throngs. Yet for all that haste the transportation facilities that have been provided in so short a time show remarkable accomplishment. The job is not finished yet—nor will it be completed until the months of winter have chilled the gaiety which was the Sesqui-Centennial and relegated it to the shelf of memories. But in the meantime there is "something doing" in Philadelphia.

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Better Car Routing and Traffic Control Proposed for Baltimore

SECOND ARTICLE

Revision of Car Routing and Traffic Control Methods Are Proposed by the Engineers to Reduce Congestion in the Business District—A Major Traffic Street Plan Is Presented that Is Intended to Relieve the Present Inadequate System of Thoroughfares

SOME 80 per cent of the lines of the United Railways & Electric Company of Baltimore are operated through or looped in the central business district. As there are many narrow and but few continuous east-and-west streets, many turning movements and an uneven distribution of service naturally result. In this area, as in other portions of the city, competitive construction and ownership of tracks has in many cases resulted in circuitous routes designed to reach certain parts of the downtown area. It appears that these routes have been modified or changed from time to time, but, as in other cities, the tendency of public opinion has been to prevent the making of changes as long as possible.

From a study of the data collected by the engineers, Kelker, De Leuw & Company, and referred to in the article published in ELECTRIC RAILWAY JOURNAL for May 22, page 883, several alternative plans for routing were prepared, based on the following principles:

PRINCIPLES OF ROUTING CONSIDERED

1. The discontinuance of street car operation on certain streets to provide for greater freedom in movement for other street traffic.
2. An even distribution of car service so as to provide the maximum opportunity for future increases.
3. A reduction in the number of turning movements throughout the downtown area, especially in the congested zone.

There are three factors in the routing of street cars, apart from topography and street layout, which contribute largely to street congestion. They are, in the order of their importance: (a) Left-turn movements, (b) right-turn movements and (c) the attempt to operate more cars over any street in a given period of time than the existing traffic conditions will permit. Working under the limitations imposed by the conditions, the recommended rerouting plan reduces the left-hand curves used by street cars in the district bounded by Center, Gay, Camden and Greene Streets from 49 to 33 (33 per cent) and the right-hand curves from 59 to 40 (32 per cent). In the most congested section of the downtown district, that bounded by Saratoga, Howard, Baltimore and Calvert Streets, the left-hand curves are reduced from eight to two and the right-hand curves from seven to two, decreases of 75 and 71 per cent respectively.

The reduction in number of curves used, together with other changes made in the routing, will decrease the number of street car turning movements made daily in the larger areas as follows: Left-hand turning movements from 13,294 to 8,197, a decrease of 5,097 (38 per cent), and right-hand turning movements from 15,085 to 10,315, a decrease of 4,770 (32 per cent). In the most congested area the left-hand turns will be reduced from 2,261 to 789, a decrease of 65 per cent, and the right-hand turns from 2,617 to 789, a decrease of 70 per cent. The car flow charts reproduced herewith show the results with the present and proposed routings during the maximum half hour of the afternoon rush.

In the report the detail changes in the various routes, with the reasons therefor, are given, along with a list of the special work and tangent track required to make the plan effective.

LIMITED STOP PLAN

The general development of Baltimore, with subdivisions having blocks of from 300 ft. to 500 ft. in length, is the greatest cause of the low speed made by street cars. Street car stops are made at almost every intersection, and the frequency of the car stops when compared with the number of stops made in other cities is one of the outstanding features of street railway operation in Baltimore. The present number of stopping places per mile of single track within each mile zone measured from Charles and Baltimore Streets ranges from 13.12 in the first zone to 8.08 in the territory beyond the 5-mile zone, averaging 10.22 per mile of single track for the entire system, as compared with slightly more than eight in Washington and in Chicago. The diagram of the residential distribution of those persons using the street cars (see page 885, issue of May 22) shows that service to accommodate the majority of them and of the persons using automobiles must be given by operating cars over the principal streets radiating from the central business district. It follows that any measure which can be adopted to secure faster speed with safety will benefit the two largest groups of people using the streets.

Widening of streets, though expensive, will be necessary in many cases if the time spent in traveling between home and office, store or factory is not to be greatly increased in the future. In the meanwhile the traveling time can be reduced for the majority of workers if some of the steps were eliminated during the morning and evening rush hours. It is recommended in the report that a limited stop service be inaugurated between 6 and 9 a.m. and between 4 and 7 p.m., and that in these periods the stopping places be adjusted so that the average number of possible stops for the entire system be as nearly eight per mile of single

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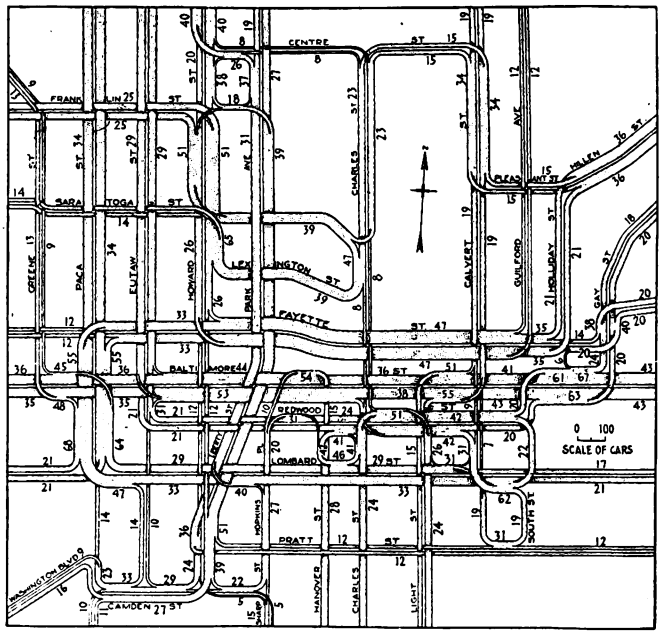
track as practicable, and that during all other hours of the day and night the stopping places remain as at present.

TRAFFIC CONTROL

Traffic control is required on the streets and highways for the safety and convenience of the users and also to provide for the efficient use of the street space. With the advent of the automobile street traffic has increased tremendously, and this, together with the necessity of promoting safety, has led to a wide extension of the scope of traffic control.

The American tendency to concentrate many activities in a small area in the center of a large city is one of the outstanding causes of traffic congestion. There is crowding, both on the roadways and on the sidewalks. In a few of the larger cities there are sec-



Car Flow in Baltimore Business District with Present Routing. The Confusion Incident to the Many Right-Hand and Left-Hand Turns Slows Down the Cars and All Vehicle Traffic

tions where saturation has nearly been reached; that is, the crowding and congestion have become so great that the streets are being used almost to capacity, and in many other cities the use of available street space is approaching 100 per cent.

The principal impediments to the free flow of traffic along any roadway are those presented by parking, cross traffic, left-hand and right-hand turns. While it is impossible to eliminate the interference of cross traffic except by grade separation, it is possible to accelerate the movement of traffic by adopting a method of control which will give to the opposing traffic streams the requisite amount of time and no more. The movement of pedestrians at intersections, if uncontrolled, greatly slows down all traffic movement and at the same time causes a very dangerous street hazard. So-called jay-walking, or the unregulated crossing of roadways between street intersections, is not only dangerous but at times interferes seriously with the free flow of vehicular traffic on roadways.

One of the greatest annoyances to a driver of a motor vehicle is the left-hand turn. The right-hand turn, in itself, is seldom an impediment to roadway traffic. However, it is a source of danger and annoyance to pedestrians. There is frequently a clamor for the elimination of both right and left turns. People who have given the subject little thought would have them eliminated entirely, and proposals for the regulation of them vary all the way from this extreme to the prohibition of turning movements at a single intersection. The elimination or prohibition of left-hand turns at a single intersection simply removes this cause of congestion to an adjacent intersection and results usually in causing equal or greater congestion at a different place. Consequently the best results are obtained in nearly all instances in dense traffic areas by the prohibition of left-hand turns on a group of streets or through an area.

A lengthy section on various forms of traffic control signals is given in the report. Automatic signal systems are held to have certain advantages. They keep traffic under control and speed more uniform. They also have the tendency to cause drivers of vehicles to follow in their own lane of traffic more closely and there is less weaving from one lane to another on wide roadways. However, synchronized signals have their disadvantages, which ordinarily are not as apparent as their advantages. The time allowance for movement in each direction is necessarily a constant throughout the zone, being governed by the heaviest streets. When automatically controlled, it frequently happens that traffic is not moved as efficiently at some intersections as it would be were these intersections under individual control. This is particularly true of the movement of street cars. Another disadvantage in this type of control is the power peak caused by the possibility of almost half the street cars in the district starting at the same time.

The erroneous idea that synchronized automatic signal systems speed up the traffic is rather widespread. This is probably because higher crest speeds may be attained with safety after the installation of synchronous signals; but the increased standing time at intersections more than offsets the slight gain resulting from any increase in crest speeds.

One of the chief interferences offered to the free flow of vehicular traffic is the unrestricted movement of pedestrians. The pedestrian has certain rights, to be sure, but certainly the time has come when his habits and rights must be modified somewhat in his own interest and in the interests of all other classes of traffic. Where there is vehicular traffic control the pedestrians should be required to obey the signals.

Safety zones for the protection and convenience of car patrons have been established and are maintained at 104 points in Baltimore, 89 in the outlying districts and 15 in the central business district. Twelve of those in the outlying districts are of the raised platform type. The minimum width of a safety zone measured from the nearest rail should be 5 ft. and the minimum space required for vehicles to pass between a safety zone and the curb 8 ft. Where the roadway space between rail and curb is less than 13 ft. the sidewalk can be recessed and the curb set back a sufficient amount to provide the necessary space for a safety zone.

Parking regulations should be progressive in their steps, advancing in restriction as traffic increases. The complete prohibition in the downtown district of Baltimore is not necessary today, but must be considered as an eventuality. At the present time it is essential to

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the city's best interest that the existing parking regulations be extended somewhat during the rush hours, but even an extended regulation will have to be modified from time to time to meet increases in traffic.

The recommendations for traffic control and parking are given in the summary at the beginning of the previous article (page 884).

THROUGH STREETS

The success of boulevard systems for pleasure cars, taxicabs and motor buses has led to a demand for a similar system of through arteries for the use of other classes of traffic. It is fully as important that commercial vehicles and street cars be afforded efficient and convenient thoroughfares as it is that pleasure cars be provided with them. A "through street" may be defined as any thoroughfare which carries all classes of traffic and which is protected by requiring all cross traffic to stop before entering them. Through streets have been found to serve a very useful purpose when carefully located.

In the establishment of a system of boulevards and through streets it must be borne in mind that too many restricted streets or a system which imposes so many boulevard and through street stops that they become burdensome will defeat its own objective. Where there are so many stops that motorists fail to observe the stop regulations, a situation is caused of much greater danger than were there no through streets.

A MAJOR TRAFFIC STREET PLAN

With one or two notable exceptions, the street system of American cities is the result of haphazard real estate development. Subdivisions have been made from time to time with one principal object in view—that of creating a unit which in itself would have an interior arrangement favorable to the selling of lots. The early highways carried very light traffic up to the advent of the automobile and were adequate to serve the needs.

Now all of this is changed. The volume of traffic which has resulted from the ever-increasing use of the automobile is bringing out clearly all of the defects of the early street plans, and today street plans are required that provide an adequate number of wide and well-paved highways to accommodate present and future traffic.

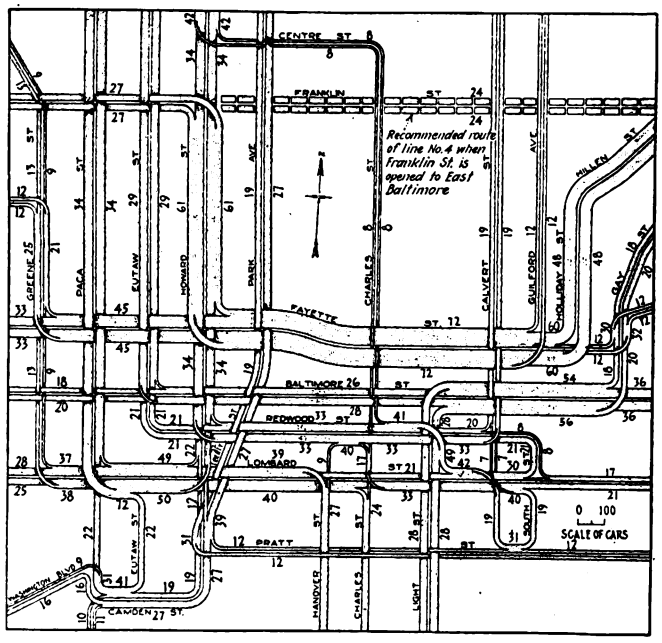
The streets of a city can be grouped roughly into two general classes—major and minor. In the first group are found those streets which, because of their location, furnish more or less direct routes from the central business district to centers in the outlying urban and suburban areas; those which by reason of continuity and the serviceable condition of their roadways are used as heavy traffic arteries; boulevards which form direct communication between parks and amusement and business centers, and business streets in the commercial and industrial districts. All other streets which connect the major streets, either directly or indirectly, may be classed as minor streets.

A system of major thoroughfares is composed of the following elements: (1) Distributor streets, (2) arterial thoroughfares, (3) inter-district thoroughfares, (4) boulevards and (5) business streets.

To reduce turning movements and unnecessary travel in the downtown area to a minimum a system of distributor streets just outside of and encircling a central congested area is required. Such a band of streets would connect with and articulate all of the important streets in the central area as well as the important thoroughfares radiating from it. Arterial thoroughfares are the principal traffic streets radiating from the central district to and through the urban residential areas to the suburban centers. Upon such streets is imposed the burden of carrying a large proportion of the traffic of the city. It is also important that a major traffic street plan provide traffic arteries connecting the various residential districts one with another.

A boulevard system should include streets touching or extending through the central business district and connecting it with the principal parks, playgrounds and residential streets, as well as to furnish easy access to the driveways in public parks.

Business streets are almost always street railway or bus line streets and, with the operation of these col-



With the Proposed Routing the Looping of Cars in the Central Area Has Been Much Reduced. Left-Hand Curves Are Reduced 33 per Cent and Right-Hand Curves 32 per Cent

lective transportation units and of other vehicular traffic, the highest traffic densities are found on them. Unfortunately these streets, which have the greatest need for ample width, are generally those upon which widening projects are almost impossible on account of the high values of land and buildings.

DETERMINING ROADWAY CAPACITY

Roadway capacity is determined by the number of traffic lanes, the amount of cross traffic, the system of traffic control, the uniformity of spacing and speed of vehicles, the skill and habits of the drivers, the type of vehicle, weather conditions and many other factors. While it is possible to calculate, assuming ideal conditions, almost any capacity for a traffic lane, such conditions are never realized. Reliance must be placed almost entirely on actual tests and observations.

It is generally assumed that a lane for moving traffic requires a width of from 9 to 10 ft. Theoretically, the capacity of a 20-ft. (two-lane) roadway for traffic moving in the same direction is twice that of a 10-ft. roadway, the capacity of a 30-ft. (three-lane) roadway three times that of a 10-ft. roadway, and so on. Practically

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the theoretical capacity of a wide roadway is seldom obtained. This is because vehicles going in the same direction weave back and forth from one lane to another, and also because the proximity of vehicles in adjoining lanes causes the driver to lengthen the interval between his and the preceding vehicle. Observations made on the Michigan Avenue Bridge, Chicago, during the maximum hour of the evening rush, show the following use of the three lanes: First lane, 100 per cent; second, 80 per cent, and third, varying between 50 and 60 per cent; making the combined use of all lanes less than 80 per cent of the maximum use of the first or inside lane. Other tests show somewhat similar figures. Counts in Baltimore showed no such degree of saturation.

From a comparison of the various counts and derived figures, it is concluded by the engineers that a single lane of a well-controlled boulevard has a capacity of about 1,500 vehicles per hour, and that 800 vehicles per hour represents the capacity of each lane of a roadway

Major Traffic Street Plan Proposed for Baltimore. The Proposed Plan Utilizes Existing Streets as Far as Possible so that a system of Arterial and Distributor Streets Can Be Provided with a Minimum Number of New Street Openings

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carrying all classes of traffic with normal conditions as to interferences. On street car streets with no safety zones it is probable that the maximum capacity of a single traffic lane will be not more than 600 vehicles per hour.

Parallel parking at the curb requires a lane of about 7 ft. in width. Street cars usually occupy a lane of about 10 ft., and for safety and convenient movement of other vehicles a 9-ft. lane is required and a 10-ft. lane is much to be preferred. In planning roadways for future developments the following allowances should be made: 34 ft. for roadways of four lanes, 54 ft. for roadways of six lanes, 74 ft. for eight lanes and 94 ft. for ten lanes.

A space must be provided on each side of the roadway for parkway and sidewalk, or for sidewalk alone. This should be a minimum of 13 ft. and preferably more. Consequently, in planning streets for future requirements, the following minimum allowances should be made:

60 ft. for streets of four lanes
80 ft. for streets of six lanes
100 ft. for streets of eight lanes
120 ft. for streets of ten lanes.

In planning for the widening of streets in built-up districts it is usually found more economical to establish new building lines well in advance of the necessity. By anticipating the necessity for wider thoroughfares and the establishment in advance of new building lines along the property lines of the streets to be widened much of the usual expense of street widening projects may be avoided. If such new lines are established ten or fifteen years in advance it would be made certain that no new buildings would need to be removed and the cost of removing the old ones may not be excessive. This method is proposed for Baltimore.

Development of Baltimore Street System

Baltimore has had a steady and continuous growth during the last 60 years and the greater portion of the street system was developed long before the advent of the motor vehicle. The original plan, adopted in 1801, with but few changes, was apparently adequate for the traffic requirements for many years. Not until after the fire in 1904 were any major street improvements consummated. The fire destroyed all of the buildings in a considerable portion of the downtown district. The Burnt District Commission carried out a comprehensive program of street widening, most important of which was the widening of Light Street and Pratt Street. Huge sums have been saved through the execution of these projects at that time.

While there are many wide streets in Baltimore, they do not have the essential continuity which makes possible the most efficient use of the roadways. The early radial roads and highways, which seldom have adequate widths in the older portions of the city, are well located and furnish more or less direct communication between the different urban and suburban centers and the central business district.

Analysis of available statistics of traffic flow in the central business district of Baltimore and on the highways throughout Maryland indicate that there is a definite relationship between motor vehicle registration and the volume of traffic. The total number of motor vehicles entering and leaving the central business district has been taken by cordon counts in October of each year from 1922 on. The following table gives the number of vehicles counted, those registered and the ratio of these numbers:

TRAFFIC FLOW AND VEHICLE REGISTRATION IN BALTIMORE

Year	18-Hour Cordon Count of Motor Vehicles	Estimated Motor Vehicles Registered	Ratio
1922.....	117,000	44,500	2.57
1923.....	138,000	55,000	2.51
1924.....	146,000	66,200	2.22
1925.....	176,000	81,400	2.19

The ratio of traffic flow in the central business district to the total number of registered vehicles is decreasing, but at a diminishing rate. It is estimated that this ratio will decrease until it reaches 2.00 in 1928 and then remain about constant. Based on this estimate the vehicles entering and leaving the central business district, if the street space permits, will increase from 176,000 in 1925 to 308,000 in 1930, an increase of 75 per cent, and to 386,000 in 1940, an increase of 119 per cent. From other statistics it is estimated that the traffic on highways where there is sufficient room for free movement will increase in almost the same proportion as does the total number of motor vehicles owned and operated. In the outer portions of the city it is predicted that by 1930 the volume of this traffic will be about 90 per cent greater than that of today, and by 1940 it will be about 135 per cent greater. From the foregoing statements it must be clear that the present street system of Baltimore must be made adequate to care for the traffic increases of the near future.

The remainder of the report deals with the detailed recommendations for creation of major streets. These follow along the lines of the City Plan Committee. The proposed changes are shown in the large map reproduced herewith. In general the recommendations provide for a series of inner distributor streets, a system of outer distributor streets parallel to and a mile or more from the inner distributor street system, with arterial thoroughfares and connecting streets to link the various centers with the central business district.

Trainmen Make Safety Suggestions

Platform Men of Cleveland Railway Appointed Regularly as Safety Inspectors—Department of Accident Prevention Formed — Co-operation with Safety Council Results in Well-Attended Mass Meeting

ONCE each month either one, two or three crews from each station, depending on the size, are appointed by the Cleveland Railway to spend one day inspecting the physical properties, including the cars, track and street conditions. A written report is made of unsafe conditions that are found. While these reports are directed to the department of accident prevention, they are reviewed in a conference held each month by the general manager, division superintendents, traveling dispatchers, superintendent of car washers, general superintendent and two of his assistants.

Suggestions that bear further analysis are assigned definitely to some one for investigation. Many suggestions are obvious and are ordered into effect at once. If corrective measures cannot be put into effect the reasons are explained to the crew making the report. Each of the men serving on these committees wears a green and white enamel button reading "Accident Prevention Committee."

A recent report picked at random (dated Feb. 3) is

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from one of the crews at the St. Clair station. It contains 23 suggestions which the committee believes will reduce accidents. To illustrate the nature and completeness of these suggestions, extending over four closely written typewritten pages, several are herewith reproduced as being typical of the reports of the trainmen's committee:

An inside grab handle is badly needed on the "1000" type cars, just outside of motorman's vestibule, in order that heavy, infirm and elderly people can board safely at the front door. The center-entrance cars have an inside grab handle and we believe they would be of great use on the "1000" type cars.

The water trough at Wheelock Road and St. Clair is always running over and then causes the street to be flooded with water. When it freezes, this place is very icy and dangerous. It seems as though the water is running too fast for the drain, which causes an overflow. The policeman on the beat ought to watch this trough more often and not let the drain get clogged up.

On the "1200" type cars there are two switch holes in motorman's vestibule that are being used by motormen who chew tobacco to spit the juice through. We have noticed that the front vestibule of these cars is cleaner and sweeter than the "1000" type. Many motormen are in the habit of expectorating behind the jack and behind the controller, rather than exerting themselves a little by opening the front door for this function. We believe, therefore, it would be a good thing in the way of sanitation if the company would put a hole in the floor of these cars near the gong at the right-hand corner, for the use of the tobacco-chewing motormen.

We believe the far-side stop, westbound, at E. 45th Street should be moved over to the near side of the street. This is a dangerous corner when the eastbound cars are unloading passengers and westbound cars are coming to the stop; the people run right in front of the westbound cars.

Since an automatic traffic signal has been installed at St. Clair and E. 105th, we believe that the eastbound cars should be brought up to the beginning of the bank building. At present, motorman stops car way back from this point and he might get the green light to go and before he gets up to the street the red light will be flashed against him and thus will have to stop and wait. We suggest also that the safety zone be extended up even with the bank building.

The accident report form now in use was in our opinion all right years ago when traffic was different. However, we believe it should be changed now to cover present times and conditions, such as a questionnaire form to include whether the driver of vehicle was intoxicated; make of vehicle; type of vehicle; number of passengers in vehicle; number of women and children; did driver make boulevard stop; rail condition; equipment condition, regarding brakes, sanders, etc. Also, another report for deadheading car caused by mechanical defects, to include such questions as, "Did conductor collect all fares; whether he gave out free transfers," etc. We believe the claim department should know about the defects, as some conductors when changing cars do not collect their fares and an argument ensues on other car.

Conductors claim that the reason so many slugs are being deposited for fare is because the table on fare boxes is generally dirty. A small light should be arranged to shine in fare box so they can see what is dropped in. The fare boxes on "1000" type cars are too low from the view of the conductor and he cannot see into fare box unless sitting on stool.

It seems that whenever a cable breaks from catching under the retriever, it is always one of the small size cables, and it catches in between the brace on retriever and retriever. These small cables should be taken off and larger or thicker cables put on or else there should be plenty of tape put on small ones so they will be larger.

A water drain is badly needed at E. 79th and Hough, southbound. The water comes from the hill and settles in the electric switch, and when motorman throws the switch the people are splashed with muddy water.

We suggest the discontinuance of eastbound East Boulevard stop and placing the Yale eastbound stop at Herrick Road. A traffic officer is stationed at this point and makes cars stop for Yale and Herrick Road traffic. The East Boulevard stop is useless where it is located as all the people live on the left side of East Boulevard.

We talked with Captain McMasters and Sergeant Nebe at the Fifteenth Precinct police station in regard to Moses' garage at St. Clair and Nottingham Road, and they said our complaint will be taken up with Mr. Moses. They told us they had many complaints about his parking violations, but this is the first one that came from the railway company.

The switch cover at E. 140th, north of St. Clair, is missing. This switch is where the Euclid cars used to wye.

Break in pavement at Larchmont switch.

Sand boxes empty at Brussells Road.

Car 923 has no hanger hook for run number.

Car 908—Retriever pulls trolley off on straight wire.

Car 917—Will not take the switch at E. 79th and Woodland.

Car 2073—No drawhead pin, front.

Car 2283—No rear screen.

Car 1025—Curtain off, front vestibule.

Car 1254—Curtain should be rewound in front vestibule.

Car 1035—Broken release spring on rear right truck.

We suggest that a lamp be installed in toilet at Euclid Beach Park.

From an examination of the several suggestions above, it will be observed that the trainmen have had some excellent ideas. Many other suggestions were made that referred to detailed operating conditions such as the elimination of certain stops, the change of safety zones and slight changes in the operation of the cars. Inspections of this kind have brought to light many minor defects and possible improvements that might otherwise pass unnoticed by the supervisory force who do not actually operate the cars.

From one of the suggestions, it is seen that the committee carried a matter to the Police Department. This has been done frequently by these platform committees, with excellent results.

Trainmen serving on these committees receive pay as if operating their regular runs. To them it is a pleasant relief from the routine of daily operation and gives them a feeling of taking an active interest in the company's welfare. This plan also brings to the notice of the company those men who are developing ability for a higher position.

Entirely apart from this inspection work are results that have been obtained by the increased co-operation recently with the Cleveland Safety Council on the part of the officials of the company. This Safety Council has been in existence for seven years. This year it has held a number of mass meetings. On Feb. 25 a general meeting of superintendents and foremen was held in the auditorium of the Chamber of Commerce Building, at which 1,200 people attended and 500 were turned away because of inability to crowd into the hall. Besides a talk on "The Philosophy of Safety" by Dr. Charles H. Rust of Worcester, Mass., an entertainment program was provided and attendance prizes were distributed. On the following evening, Feb. 26, a meeting of commercial drivers was held, with equally gratifying results.

While it takes some time to determine actually the results of such accident prevention activities, definite improvement has been noticed. A "no parking" ordinance has recently been passed and made effective during the rush hours. The ordinance requiring boulevard stops has been in existence for some time, but recently has been rigidly enforced.

The company has insisted that cars be under control while crossing special work and entering the subway under the high level bridge. The first tangible result to be noticed has been a reduction of 18 per cent of car collisions.

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Texas Properties Are Getting Results from Good Merchandising Work

SECOND ARTICLE

Subsidized Bus Service Is Houston's Answer to the Problem of Providing Transportation Facilities to Newly Developed Communities — San Antonio Relies on Its Widely Extended Telephone Dispatching Service to Perform a Large Part of Its Supervisory Work — Coffin Prize Contest Attracting Attention

By John A. Dewhurst
Associate Editor ELECTRIC RAILWAY JOURNAL

ALERT police regulations are common to all Texas cities. One does not cross a street against the traffic signals with impunity. A near-by officer always challenges the offender and explains the purpose of the regulation of pedestrians. The courtesy by which this is done is of particular interest to the northern visitor.

This trait of courtesy has been carried perhaps farther in El Paso under the direction of Stanley Good, captain of traffic police of that city. He believes that speed with safety is not much slower than recklessness and proved it to its citizens by dashing across that city during a busy hour violating every traffic rule and regulation, passing cars on the left and generally doing all things a good motorist would not do. The trip took eleven minutes. He then made the same trip under similar conditions in a safe and sane manner, obeying all regulations, and it required thirteen minutes—two minutes more for safety.

Of outstanding merit has been the co-operation between the police department of El Paso and the El Paso Electric Railway. Much has been accomplished by the close co-operation between these two organizations in the regulation of traffic and the movement of the large number of passengers who daily ride the electric cars.

HOUSTON GROWING RAPIDLY

Houston has benefited tremendously by the completion of the ship channel that allows ocean-going craft to reach the city. Home-building projects in outlying territories are extensive and have placed a trying burden on the Houston Electric Company, operating the city transportation system in this fast-growing city.

Bus service has been supplied on eight different lines, five of which are complete routes from the center of the city to outlying districts, while the remaining three provide feeder service.

SUBSIDIZED BUS SERVICE IN HOUSTON

Subsidized bus service is operated on four lines at present. The three of these lines running into the center of the city are express buses, running without stop from the outlying districts to the city center. The other subsidized line is a feeder or extension service to a car line. The subsidized lines are clearly marked and the passengers know that the service depends on the subsidy from the real estate operators.

The basis for a subsidy is a contract between the railway and the real estate company, whereby the Houston Electric furnishes the necessary equipment and operates it. The real estate developers agree to pay all operating expenses, after first crediting all revenues collected. The operating expenses, including depreciation, are equivalent to approximately 28 cents a bus-mile. On the main lines the revenue has gradually increased and is now running at about 16 to 18 cents per mile. The Houston Electric Company reserves the right to take over any operation at any time and agrees to do so whenever the revenue equals or exceeds the expense for a period of six successive months. The permit to operate received from the city is granted from year to year. It is dated coincidentally with the annual contracts or renewals. The fare charged on all express buses is 10 cents cash with free transfers to cars or other buses. On non-subsidized lines or on regular buses, the same fare is charged as on cars, namely, 7 cents cash or four tickets for 25 cents.

"Courtesy Pays." This Device, Distributed by the Northern Texas Traction Company, Consists of Two Cardboard Disks. By Moving the Under Disk to Any Position Marked, a Picture Is Shown of the Accident that May Happen

To improve the service in general and to give better transportation the company is giving some thought to operating express service on other car and bus lines.

Many city cars are being repainted and electric flashing signs are being supplied, reading "We thank you," "Enter at the front," Leave by the rear," etc. Treadle-operated rear doors are being installed on a number of cars as they go through the shops for overhauling.

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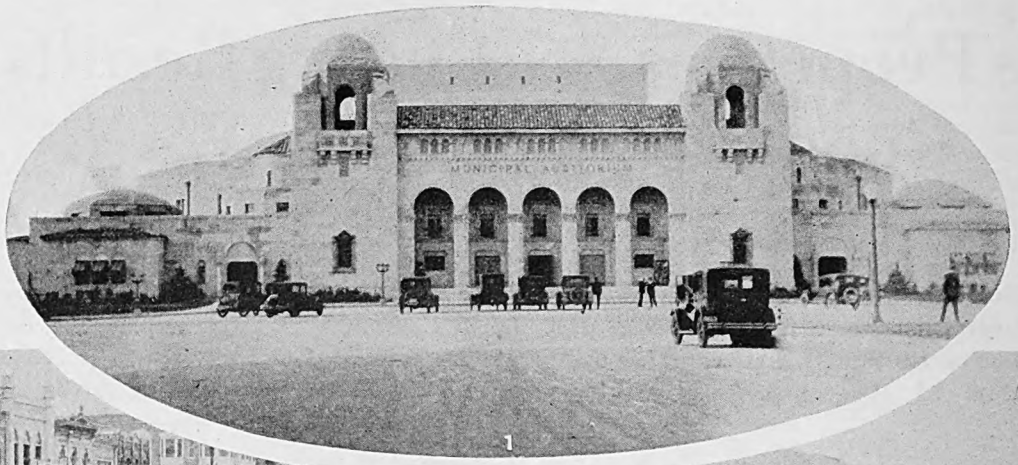

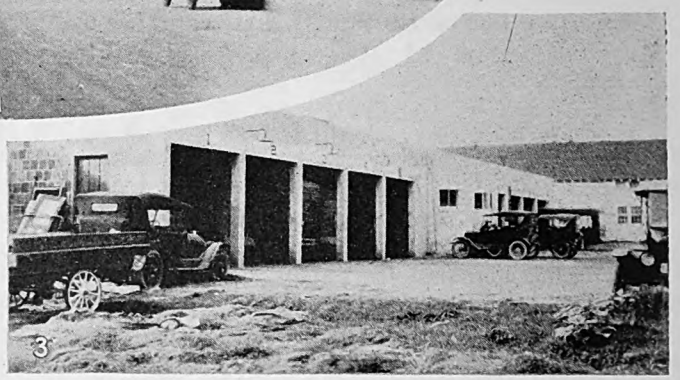

Furnishing Transportation in Texas Cities

1. New municipal auditorium in San Antonio opened on April 19. This is one of the outstanding developments showing the progress of this city during the year.
2. Street scene looking north on Congress Street in Austin. This 100-ft. street allows ample room for street car movements and enables this company to maintain a high schedule speed.
3. Houston's bus garaging facilities in the rear of the carhouse. Each berth will accommodate two buses.
4. Looking south on Main Street, Houston. Street car service was abandoned on this street to give way to vehicular traffic and the cars are now operated on adjoining streets, where vehicular traffic is not as heavy.
5. On the route of the River Oaks bus line in Houston is found this sign, which is self-explanatory. The bus is a recognized means of transportation to this community.
6. After two hours rain in San Antonio, the streets often become flooded, as shown in this picture. The re-establishment of car and bus service was greatly aided by the extensive telephone dispatching service used on this property. The auto to the left is stalled, the one to the right will be!
7. One of the River Oaks subsidized express buses ready to leave a downtown terminal in Houston.
8. Carhouse and storage yards of Houston Electric Company.

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Such cars are painted in different color combinations, it being desired to provide a change and to attract more attention. A further description of "Houston's talking cars" will be given in an article in ELECTRIC RAILWAY JOURNAL by F. J. Bennett, master mechanic for the Houston Electric Company.

MAINTAINS SERVICE BY TELEPHONE DISPATCHING

San Antonio has used a telephone dispatching service to maintain the cars on time. W. H. Holden believes that this system not only makes the service more flexible but is an economy that pays the cost of the telephone equipment and then some. Fewer inspectors are required and more efficient service is maintained. All operators call the dispatcher at the end of each line just before their scheduled leaving time. Other telephones are installed at intermediate points, there being 46 stations in all.

In addition to this system twelve inspectors are used to operate the eighteen car lines and the seven bus routes, requiring in daily operation 130 cars and 24 buses.

An example of the use of telephone dispatching was afforded on April 20. A severe rainstorm took place, 3½ in. of rain falling in two hours. Practically all car and bus lines were blocked by temporary floods for from 30 minutes to two hours. Several cars and buses went dead due to water-soaked equipment.

Despite this severe condition service was established on all but two lines in about two to three hours. On these two lines more serious trouble developed that required track or bridge repairs. Connecting service, however, was established until these lines could be repaired. Due to the telephone dispatching, lines could be placed first on long headways and then more frequent, as equipment became available.

In addition to this reliability feature, considered essential by Mr. Holden, the service is studied and schedules are changed as traffic checks indicate necessity. Cars are being repainted frequently and in many cases a blue lone star, the emblem of the state of Texas, is painted on the outside.

The work of the traffic study and control through

Northern Texas Traction Company
WELCOME LEGIONNAIRES

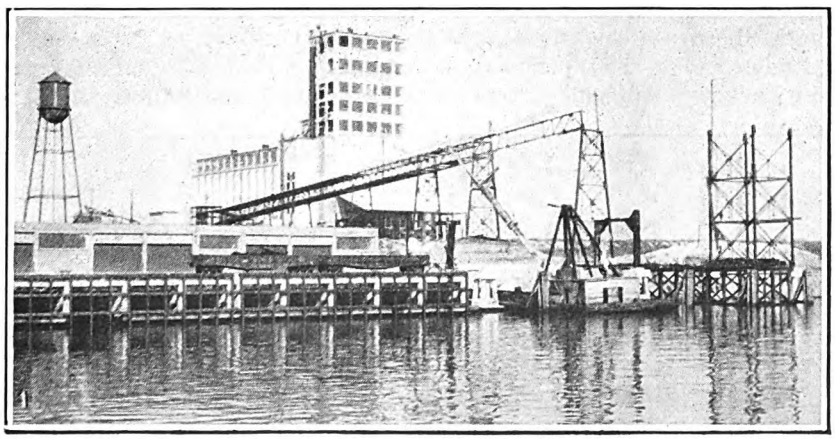
This ticket, if presented at any time on
SEPTEMBER 1, 2, 3 OR 4, 1925
will be accepted in payment of one fare on the CITY CARS only of this company.

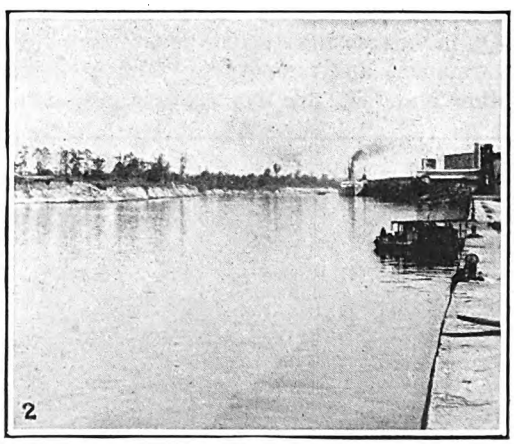
NOT GOOD IF DETACHED

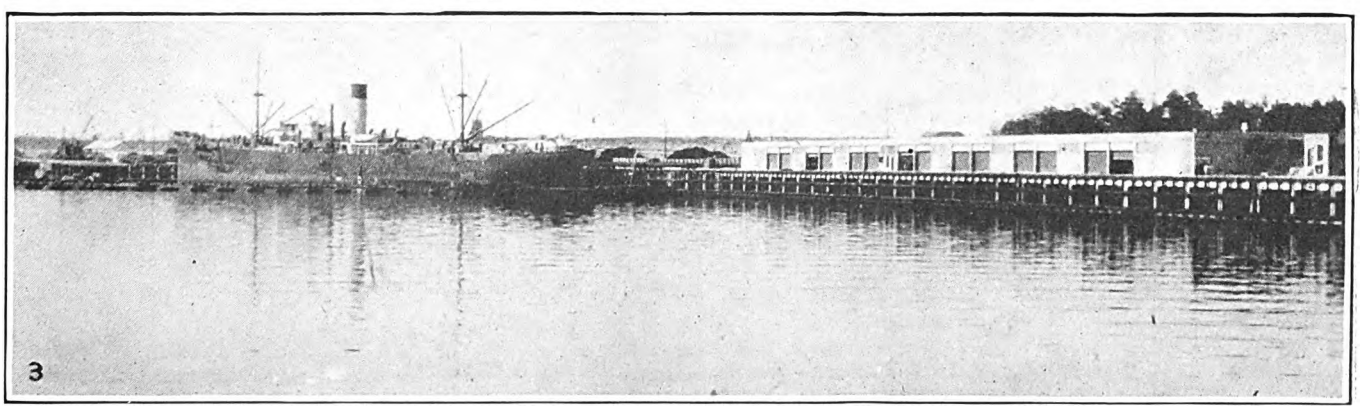
The "Information" Trainmen of the Northern Texas Traction Company will be glad to direct you to any part of the city.

These tickets are issued complimentary by the General Convention Committee of Bothwell Kane Post No. 21, Fort Worth, for the Seventh Annual Convention of the American Legion, Department of Texas.

Reproduction of One Ticket from a Book Distributed to the American Legion in Conjunction with the Northern Texas Traction Company of Fort Worth. The Book Contained Ten Such Tickets, and When Used Was Paid for by the American Legion. Nearly $1,500 Worth Were Sold During the Four Days of the Convention. This Plan Was Explained in an Article that Appeared in the May 22 Issue of This Paper







1. At the entrance to the turning basin of Houston's ship channel are large docks and elevators, as shown in this picture.
2. Houston's docks extend for some distance down the entrance of the ship channel.
3. Looking across the turning basin at the Houston end of the ship channel. Ocean-going craft can load and unload at extensive docks. It is this ship channel that has caused much of Houston's recent growth.

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engineering records has continued under the direction of W. R. Castle, transportation engineer. The work and methods used were told in the ELECTRIC RAILWAY JOURNAL of July 25, 1925, page 121. Service is budgeted in advance and schedules are built to provide this service. Careful checks are made continuously and changes are made in schedules wherever conditions warrant.

Schedules have been speeded up. Based on careful studies, the schedules between time points have been shortened to avoid slow running. Cars are given definite time points inbound from the end of the line to the city center, but are than allowed to proceed as fast as possible on the outbound trip to the end of the line, as few people are picked up on the outside of the city center on the outward trip.

Congress Street, Austin, being 100 ft. wide, has ample room for parking on the side and generally allows a clear track for the cars, so that a relatively high schedule speed is maintained.

The Austin Street Railway contemplates establishment of bus service to new developments, but to date all service is given by cars, most of which are the lightweight single-truck one-man type.

Many companies are planning to enter the contest for the 1926 Coffin Prize. Some companies have this work well under way. Based on the experience of three years past some excellent presentations are expected.

Railway Doing Well in Augusta

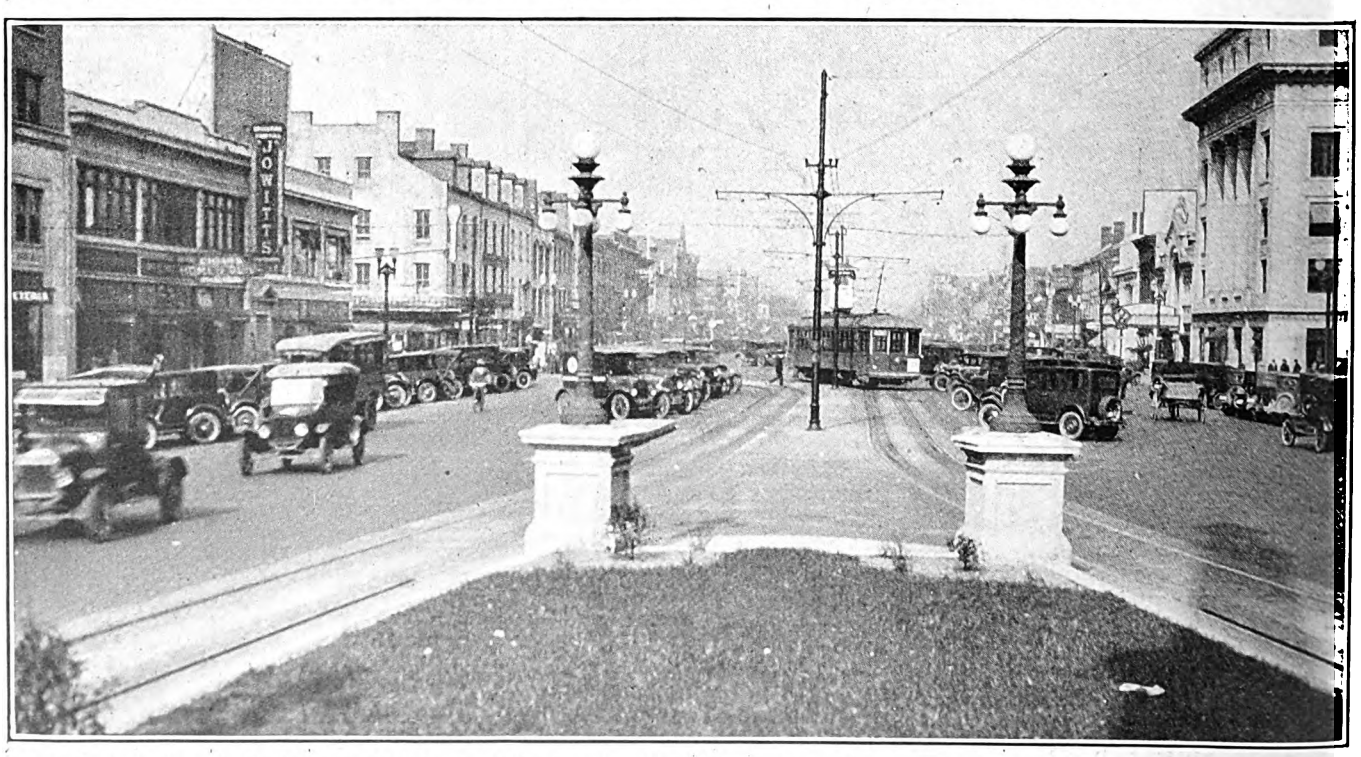
One-Man Cars Used Exclusively on City Lines—Improved Rolling Stock Has Brought Lower Costs —No Increase in Competition from Private Automobiles Expected

LIKE many other cities in the South, Augusta, Ga., is attracting each year more residents, both permanent and temporary. Owing to its altitude, dry climate and equable temperature, Augusta and its neighboring city in South Carolina, Aiken, have always been favorite resorts during the winter for many persons of means and leisure who wish to escape the rigors of a Northern winter. While the number of this class of residents is increasing, Augusta has also participated in the industrial activity and growth which recently has followed a better recognition of the advantages possessed by the South for manufacturing purposes. These advantages include a lower cost of labor because of cheaper living conditions, low cost of power because of the many hydro-electric developments and freedom from transportation delays because of practical absence of snow. To these, in some instances, may be added proximity to the source of raw materials, as in the case of cotton mills and manufactures requiring the use of lumber and steel.

All of these conditions have helped the traction properties of the South. As opposed to them have been the increasing number of private automobiles and a climate which permits their use without difficulty for twelve months during the year.

Augusta suffers from this latter cause. Its main street is wide enough to permit two trolley tracks in the center, a line of parked automobiles on each side of the double track, at least two lines of moving vehicles on each side of these parked automobiles and, next to the curb, still another line of parked automobiles. There are, it is true, regulations limiting the period of parking, both against the reservation in the center of the street and along the curb line at the side, but if an automobile leaves its place before the end of its parking period, another is pretty sure promptly to take its place. Of course, the loss of traffic which has come from the competition with private automobiles has a theoretical maximum which now must have been nearly reached, because of the difficulty which the average driver finds in locating a parking place.

The principal transportation improvements on the Augusta system by the Augusta-Aiken Railway & Elec-



The Principal Street in Augusta Is Wide Enough for Two Tracks in the Center, a Row of Automobiles on Each Side of These Tracks, a Roadway Outside of These Parked Automobiles and a Row of Parked Automobiles Along the Curb

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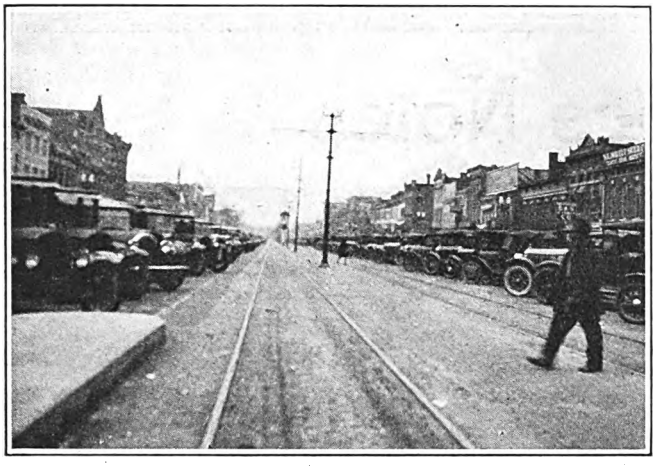


The Space Outside the Tracks Is Used for Parking Except at the Island Platforms

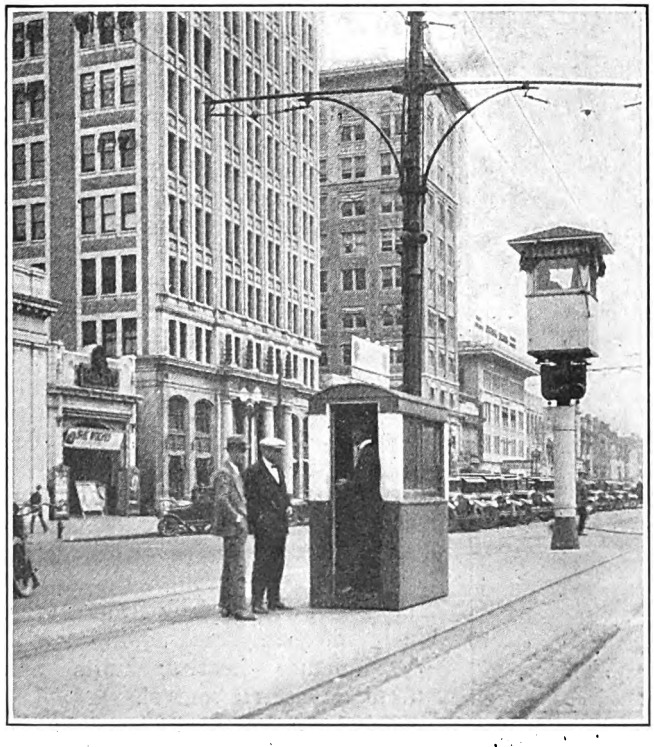
tric Corporation during the past few years are new cars, the addition by the city of several island platforms for waiting passengers and the construction of a dispatcher's office and information booth between the tracks at a central point in the downtown section. A representative of the company is stationed at this booth from 7:10 a.m. to 9:47 p.m. His duties are to make change and supply tokens to conductors, check schedules, issue orders to trainmen, etc. He is connected with other points on the system by telephone. All cars of the company, both city and interurban, pass this point.

The company uses 32 cars in its normal service. Fifteen of these are of the single-truck Birney type. Ten are double-truck safety cars made over from two-man

TABLE I—OPERATING EXPENSES PRINCIPALLY AFFECTED BY CAR MODERNIZATION, CENTS PER CAR-MILE

	1923	1924	1925
Power	1.12	0.84	2.07
Conducting transportation	10.92	8.74	8.68
Maintenance of equipment*	3.6	3.1	2.8

* Exclusive of depreciation.



This Dispatcher's and Information Booth Is on an Island Platform near the Center of the City

TABLE II—MAINTENANCE OF EQUIPMENT, EXCLUSIVE OF DEPRECIATION, CENTS PER CAR-MILE
(Including accounts 29 to 38 inclusive)

	1921	1922	1923	1924	1925
City	4.9	3.9	3.9	3.1	2.7
Interurban	6.6	4.6	3.05	3.3	3.3
Average	5.6	4.1	3.6	3.1	2.8

cars and seven are used for the interurban division of the company. Of these seven cars, five are used for through business and have two-man crews. The others, which do only a local business for about 5 miles out from Augusta, are one-man cars.

The company's modernizing program for rolling stock during the last four years has brought material savings in operation, as the accompanying tables show. The first table gives the expenses for power, conducting transportation and maintenance of equipment, on the car-mile basis, for the past three years. The high cost for power in 1925 is due to the use of steam power during a long drought which occurred last summer. Table II gives data on equipment maintenance expenses.

As yet the company has put in service only one bus. It was supplied by the Yellow Truck & Coach Manufacturing Company and operates on the interurban route between Augusta and Aiken. In view of the large variety of fares charged on this line, the company has put in a National cash register for registering the fares.

The Readers' Forum

Cost of C., M. & P. S. Electrification Was $22,000,000

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY
Legal Department

CHICAGO, May 11, 1926.

To the Editor:

Today my attention has been called to erroneous matter contained in an article published in your issue of the 24th ult. under the caption "John D. Ryan offers intimate information."

The article, in dealing with the cost of electrification of the Chicago, Milwaukee & Puget Sound, states the cost of that electrification to have been $200,000,000, whereas the fact is the aggregate cost was slightly over $22,000,000. The third paragraph of the same article contains another error in figures in that the article states that the copper purchased by the railway company from the Anaconda company was worth $5,500,000. The fact is that the cost to the railway company of that copper was $3,900,000.

Your journal is read by persons who are technical and critical. The railroad management is at present being criticised, largely because of misinformation. As the representative of the Chicago, Milwaukee & St. Paul Railway, in charge of the proceedings involved in the Interstate Commerce Commission's investigation of why the road went into receivership, I am very much concerned in correcting misinformation and misleading statements. I am, therefore, bringing the foregoing to your attention in the confident belief that you will agree that in justice to your journal, to its readers and to the Chicago, Milwaukee & St. Paul Railway a correction of the April 24 article should be published in an early issue.

O. W. DYNES,
General Solicitor.

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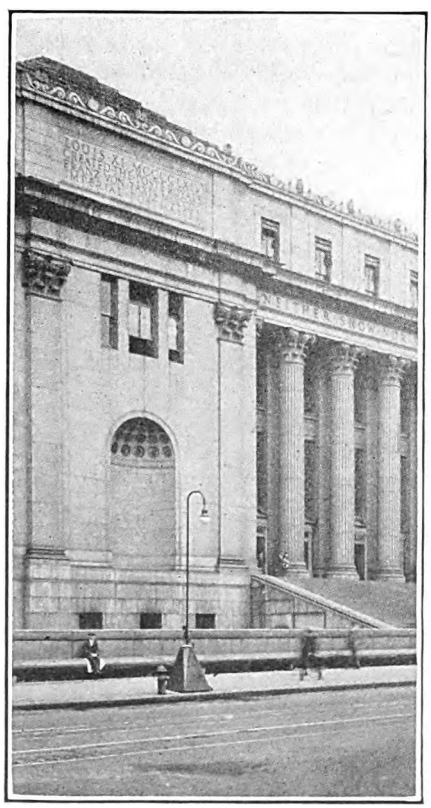
Maintenance Notes

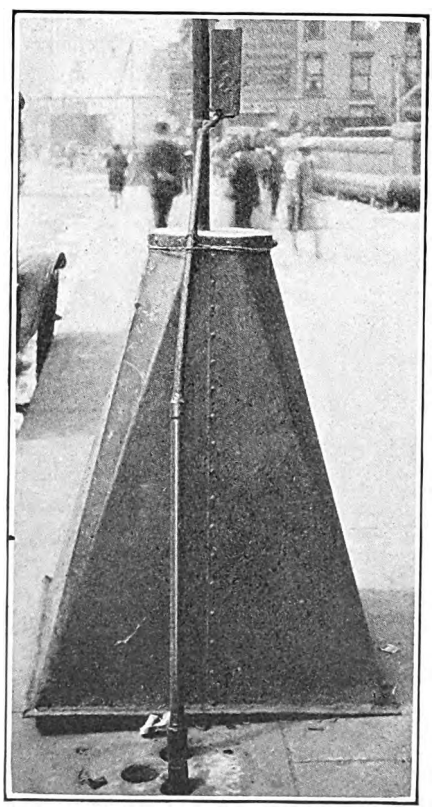
Temporary Lighting Stands

IN RECONSTRUCTION work for electric railway operation it sometimes becomes necessary to provide temporary lighting of the streets due to disturbing the permanently installed lighting system. Such a condition exists along Eighth Avenue, New York City, where new subway construction is taking place. The permanent lighting fixtures have been removed and in their place have been substituted temporary lighting stands of the type shown in the accompanying illustration. These consist of a heavy base support with an upright constructed of 1-in. pipe. This is bent in a loop at the top and the lighting fixture is hung from this. The base is constructed of sheet steel and is 3 ft. square at the bottom. This tapers to an octagonal shape at the top which is about 12 in. across. The height of the base is 4 ft. In order to provide a solid anchorage for the upright pipe, the top is filled in with concrete. This is easy to install and sets quickly.

The lighting connections are carried outside the base connection being made to the original lines. The junction box of sheet steel is installed on the upright 18 in. above the top of the base. This type of construction forms a cheaply constructed as well as a neat appearing arrangement which can be moved readily when work in the immediate vicinity is taking place.



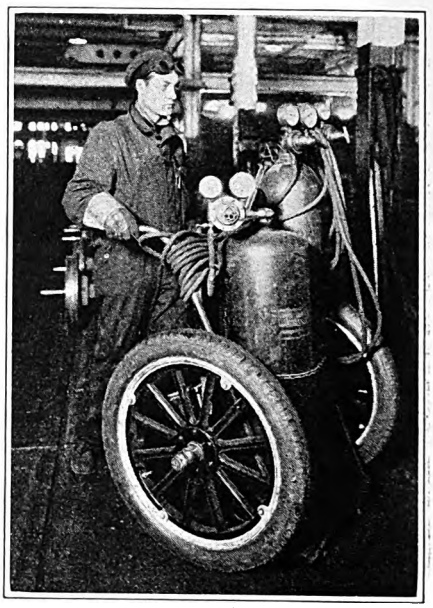
Temporary Lighting Stand in Front of the Post Office on Eighth Avenue, New York City



The Base, Constructed of Sheet Steel, is Square at the Bottom and Octagonal at the Top

Pneumatic Tires on Acetylene Welding Truck

IN WHEELING acetylene welding outfits about the shops of the Department of Street Railways, Detroit, Mich., it was found that the gages and welding equipment got out of adjustment due to the vibration when passing over rough flooring and tracks. To remedy this condition, the welding trucks of the railway are now all provided with pneumatic-tired wheels. The cheapest and most satisfactory construction is to use standard Ford front wheels. Old tires from the company's automotive equipment are used.



Pneumatic-Tired Welding Truck in Use in the Shops of the Department of Street Railways, Detroit, Mich.

The framework for the truck is made of ¾-in. pipe. This is bent outward at the top to form handles. A bottom step of 3/16-in. sheet steel is provided, on which the tanks are mounted. On the other side, a box of sheet steel is built into the construction, in which small welding equipment is carried, together with welding wire, etc.

Armature Failures Eliminated by Baking

NO MEAN record was established by the Beaver Valley Traction Company, New Brighton, Pa., when the entire winter of 1925-26 was passed without experiencing a single armature or field failure. This freedom from breakdowns was accomplished largely through the use of a bakeoven designed by H. J. Meyer, master mechanic, and equipped with Westinghouse heating units and automatic electric control.

Field coils are first placed in the oven and subjected to a drying out heat for a period of from eight to

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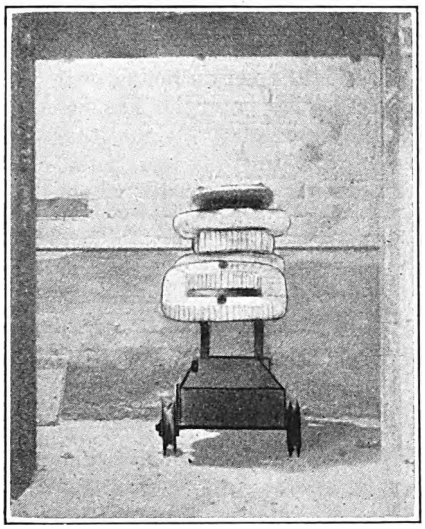


This Baking Oven Has Proved a Desirable Accessory to the Equipment of the Beaver Valley Traction Company

ten hours. They are then dipped and returned to the oven for the final baking. The latter process also requires from eight to ten hours, so that the preparation of the units extends over a period of approximately 24 hours. Thermostatic control maintains the baking temperature of the oven at 230 deg. F. Five heating units are provided, three at one end of the oven and two at the opposite end.

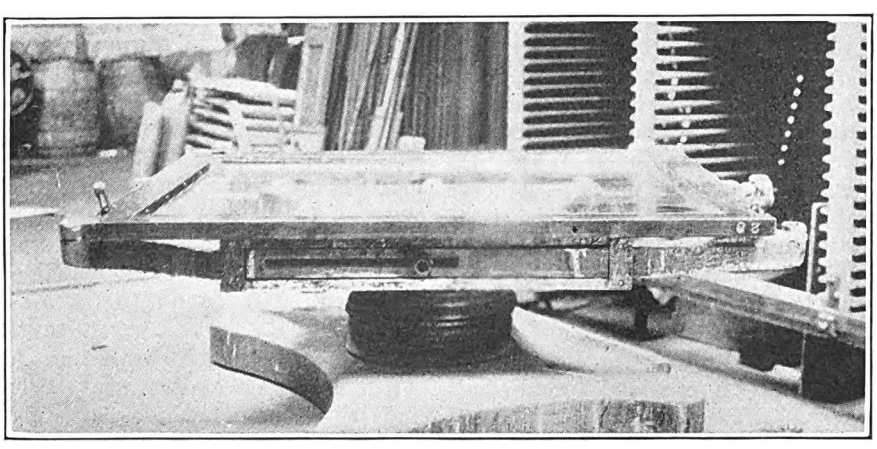
The oven is constructed of brick and access is through an opening with a sheet steel door. This door is arranged to raise and is counterbalanced so that its position may be maintained at any height desirable. Electric equipment for baking or drying is wheeled into the oven on a four-wheeled truck. The accompanying illustration shows some field coils in position for baking.

Turntable Speeds Sash Painting

CONSIDERABLE reduction in the time necessary for painting car sash has been made possible in the shops of the Grand Rapids Railway, Grand Rapids, Mich., by use of a small turntable on which the sash is placed for painting. The base for the turntable consists of a wood block 2 in. thick. On top of this two round blocks, each of 8 in. diameter by 2 in. thick, serve as swiveling bearings. A round rod in the center acts as a shaft and the top framework can be lifted off for convenient handling.

The top consists of a central wooden frame about 18 in. square. This has side extensions which when closed are 33 in. over all and which can be pulled out to 48 in. over all. They are clamped in any desired position by wing nuts. Rubber spools form the support for the sash during painting. These are 1 in. diameter by ½ in. thick. There are six of these on the center block and four additional spools on the extensions, one at the end of each arm.

A large number of different sized sash can be accommodated by this arrangement. The glass part of the sash rests on the spools during painting, so the entire frame is not touched. By rotating the frame the workman does not have to reach across the sash.



Convenient Turntable Fixture Reduces Labor of Painting Sash in Grand Rapids

New Equipment Available

Improved High-Speed Circuit Breaker

DIFFERENTIATION between legitimate overloads and short circuits by automatic means requires many important details in circuit breaker design. The new type high-speed circuit breaker of the Westinghouse Electric & Manufacturing Company is an air-break switch of the contactor type without auxiliary arcing tips. The breaker has a movable contact of solid copper bridging two stationary contacts. The movable contacts are held closed by the action of an electromagnet. Inside the breaker structure the path of the line current is divided into two parallel circuits. One is stacked with iron punchings to form an inductive circuit, while the second is non-inductive and is passed through the magnetic circuit of the breaker's "holding-in" coil, in such a manner that the flux due to load current bucks the flux of the holding magnet.

Under normal load conditions the holding coil flux predominates and the breaker is held closed against the action of strong springs and the currents in the two parallel paths vary inversely as the resistance of the paths. Under short-circuit conditions, one path being inductive, the current divides in the parallel paths inversely as their impedances. Therefore, the non-inductive path through the holding coil field will carry a much larger proportion of the short-circuit current and the holding coil flux will be bucked down, allowing the breaker to open instantly by the action of the opening springs held in tension by the holding magnet. A powerful magnetic blowout and an arc chute of ample size serve to lengthen the arc incident to the interruption of the circuit to a point of instability at such a high rate of speed as to dissipate it in a very short time. Under conditions of steady load or slowly changing load the inductive shunt has little or no effect on the current which divides between the two paths in the inverse ratio of their resistances.

The breaker is held in the closed position against the action of strong springs by the holding-in armature sealing to the holding-in magnetic circuit. To open the breaker the flux of the holding coil must be bucked down to such a value that the seal will be broken by the action of the opening springs. It is apparent that for given values of shunt resistance, bucking-bar resistance and flux of the holding-in coil, there is a certain value of excessive overload current that will buck down the holding-in coil flux and open the breaker. It is also evident that this value of overload current required to open the breaker will decrease in magnitude as the voltage on the holding-in coil is decreased. Due to its inherent de-

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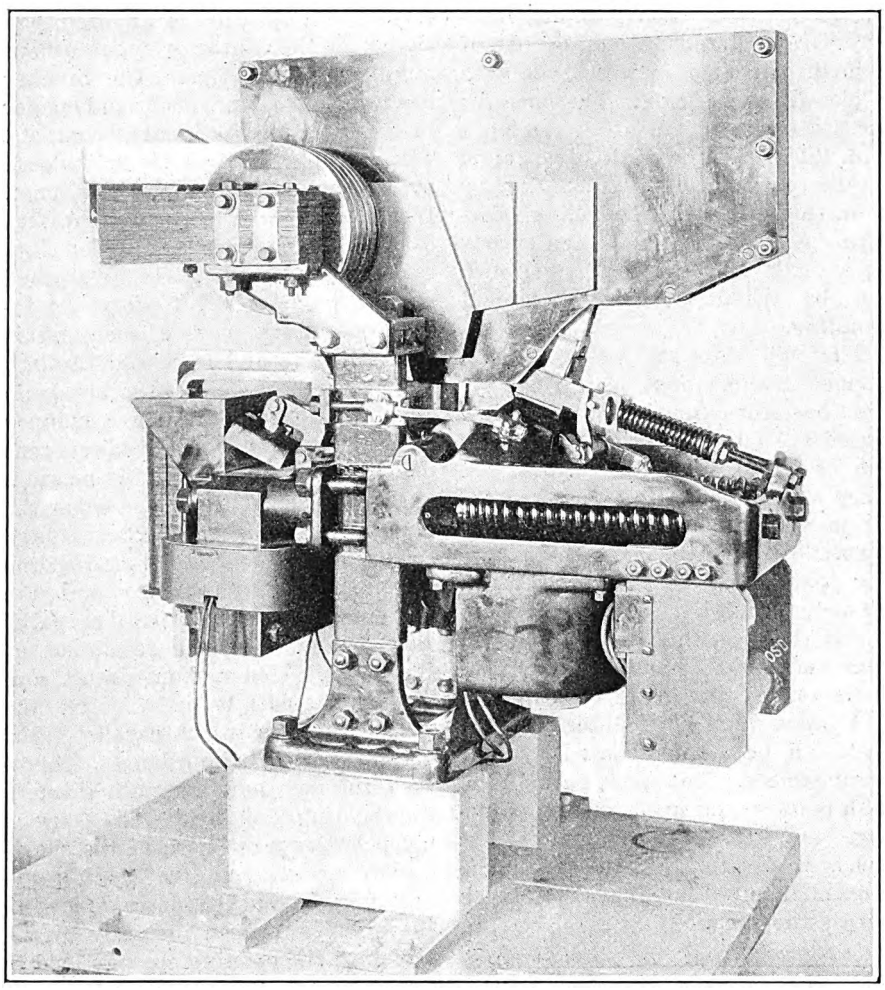


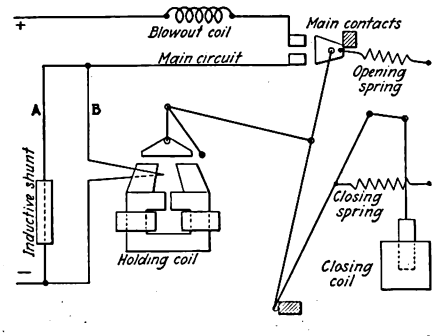
Type HS 300-Amp., 1,500-Volt, High-Speed Circuit Breaker

sign characteristics the high-speed breaker will open on short circuits and excessive overloads.

The division of current between the bucking-bar and shunt, the holding coil flux and the inductance of the shunt circuit is so proportioned that the breaker will not open at overloads within the capacity of the machine. The features of the automatic switching equipment are so designed that load-limiting resistance is inserted in the machine circuit with overloads to limit the output of the machine to within its rated capacity. Therefore, the slowly rising overloads are automatically limited before they reach a value great enough to open the breaker.

High-speed breakers are designed essentially for machine protection and should be connected in the machine circuit with its holding-in coil excited from the machine voltage. Under operating conditions the breaker will be supplied with normal voltage, thus making it possible accurately to adjust the tripping mechanism so that the breaker will differentiate between short circuits and legitimate overloads, opening only on short circuits.

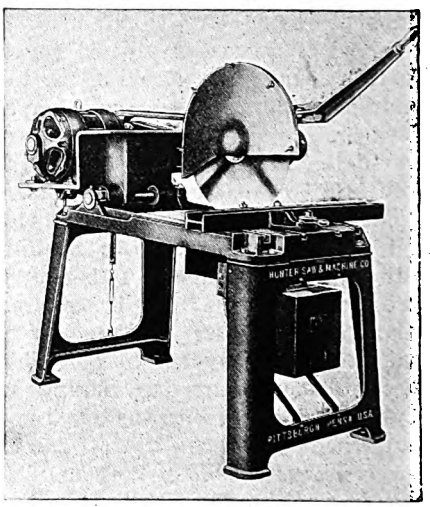
When high-speed breakers are used in feeder service it is necessary to excite their holding-in coils from the station bus unless an expensive storage battery or motor-generator set is supplied for that purpose. Under such conditions the breaker is operating with an impressed voltage on its holding-in coil that may vary as much as 100 to 150 volts as the load-shifting resistances are cut in to lower the bus voltage and transfer a portion of an overload to adjacent stations. If the breaker is calibrated to select between legitimate overloads and short circuits with normal bus voltage impressed upon its holding-in coil, it is evident that the breaker will open on heavy overloads when the bus potential has been reduced appreciably by the insertion of the load-limiting resistance, thus interrupting the circuit when it is most important that the feeder breaker should remain closed.



Diagrammatic Sketch of High-Speed Circuit Breaker Connections

Tilting Frame for Motor-Driven Saw

WITH the driving motor and saw blade mounted at opposite ends of a tilting frame, a high-speed circular metal cutting saw has been designed by the Hunter Saw & Machine Company, Pittsburgh, Pa. A double-jaw, quick-acting, eccentric vise is used to hold the material firmly during the cutting operation. The table of the machine is provided with a quadrant stop that can be set to any angle within the sweep of the saw blade. A pan is attached to the under side of the table to catch cuttings and so aids in keeping the shop in neat condition.



High-Speed Metal Cut-Off Saw

Adequate protection to the operator is provided by means of steel guards that cover both the belt and saw.

The machine is driven from a Westinghouse Electric & Manufacturing Company's motor, through an endless belt. A push-button-controlled magnetic starter is used for the control of the motor. Proper alignment of the pulleys is obtained by having the motor keyed to the base, the handwheel providing for convenient belt adjustment. The low belt tension which is a particular feature is provided through a wide belt.

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Association News & Discussions

Dimensions for Carbon Brushes and Shunts Listed

SIMPLIFIED lists of sizes and dimensions for carbon brushes and brush shunts were established by the division of simplified practice of the Department of Commerce at a meeting held in Washington on April 14, 1926. This conference included representatives of manufacturers, distributors and users of carbon brushes and brush shunts, and was held at the request of the Electric Power Club in an endeavor to determine reasonable size limits within which one dimension might vary in respect to another fixed dimension.

It was the sense of the conference that a standing joint committee be organized which will include representatives of all elements of the industry and whose function will be to observe the adequacy of the recommendations now adopted through the first active year. The first concern will be to give further study to many important suggestions that were developed at the meeting. The standing committee will consist of two representatives of brush manufacturers, two representatives of the motor and generator manufacturers, two representatives of the retailers and two representatives of the users.

It was the opinion of the conference that close co-operation between the manufacturers of carbon brushes and the fabricators of brush holders will prove advantageous to both groups, with the result that further simplification will appear desirable and practicable at some future time. The conference also felt that engineers, designers, purchasing agents, superintendents and standardization bodies, who are in any way concerned with carbon brushes and brush shunts, will derive tangible benefits from a simplified list of sizes. Such practice should decrease stocks, production costs, selling expenses, misunderstandings, etc. The American Electric Railway Association was represented at this conference by R. H. Dalgleish, chief engineer Capital Traction Company, Washington, D. C.

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 10-11—Advisory Council conference electric railway executives, Eastern region, starting 3 p.m. June 10, Engineering Societies Building, 29 West 39th Street, New York City.

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Creosoted Pine Poles*

By H. E. Braunig
Superintendent of Transmission and Distribution Eastern Texas Electric Company
Beaumont, Tex.

STRENGTH tests on wooden poles were conducted by the American Telephone & Telegraph Company in 1924 and by the United States Forest Products Laboratory in 1923. Each of these authorities found that pine is the strongest of the pole woods. Bulletin 556 of the Department of Agriculture lists it as 44 per cent greater in strength than the next strongest species, and this comparison was verified by the work of the Forest Products Laboratory.

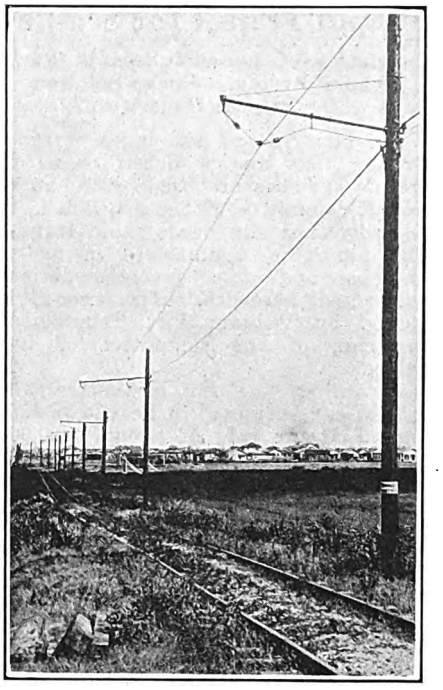
In line construction, practical advantage is taken of the increased strength of pine, either by using smaller poles or by using longer spans. Three years ago our company adopted pine exclusively and in general we now use all poles 1 in. less in top diameter than formerly when other species were used. Pine maintains its strength over a long period. Tests made during the last eighteen months on creosoted pine poles 27 years old show that there was no decrease in strength.

The life of creosoted pine poles has been variously estimated at from 25 to 40 years. The Pennsylvania Electric Association's report in 1923 gives the anticipated life as 35 years. A recent paper by the Carolina Light & Power Company gives a life of 40 years. One of our oldest lines between Port Arthur and Beaumont was built in 1912. In its construction 652 poles were used. To date, three of them have been replaced due to decay, caused, so far as can be determined, from abrasions. Practically no decay has occurred at the ground line or top. Another line between Dallas and Sherman, Tex., was built in 1909 and contained 2,400 poles, none of which has been replaced. There is no doubt that the present-day application of the treating process is much better regulated and more scientifically handled than with these older pole lines. It therefore seems safe to assume that the treated pole itself is an even better product than we have hitherto obtained.

The conductivity of the wood is not increased by creosoting, and due to deep penetration of creosote it is a toxic to white ants. Impregnation by the full cell process with coal tar creosote renders wood resistant for at least 25 years.

Creosoted wood when new is more readily inflammable than untreated wood, but when it becomes older it is less inflammable.

*Abstract of a paper presented at the sixth annual convention of the Southwestern Geographic Division of the National Electric Light Association, Galveston, Tex., April 15, 1926.



Trolley Line of the Port Arthur Traction Company with Creosoted Pine Pole Construction Installed in 1911 Has Had No Replacements to Date

Birney Club to Discuss Obsolescence

"WHAT Constitutes Obsolescence in Street Cars" will be the subject of a paper by W. J. Mackle, superintendent American Car Company. This will be presented at the next meeting of the Birney Club, to be held in St. Louis at 6:30 p.m. on June 7.

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The News of the Industry

Rapid Transit for Seattle

Committee of Laymen Sees in Rapid Transit System a Cheap Solution for Present Difficulties

One hundred and six pages of typewritten text and a dozen pages of artist's sketches are used by the rapid transit committee of Seattle, Wash., to tell why that city needs rapid transit. The report is summarized in twelve findings and two recommendations abstracted herewith. The report is signed by William Pitt Trimble as chairman of the committee of five citizens.

According to the committee the "street car business" in Seattle is falling off at the rate of about 1,000,000 passengers yearly, notwithstanding that the population during the last fifteen years has more than doubled.

The members say that the multiplication of street traffic during the last fifteen years in the downtown sections of Seattle and other cities of this class has demonstrated the impracticability of surface cars providing cheap and quick transportation in competition with the automobile. In the six years from 1919 to 1924 the number of trolley car passengers across the drawbridge fell off 21 per cent, while the number of automobile passengers gained 181 per cent. During the same period, in cities supplied with rapid transit lines, the business has increased faster than the population. Says the committee:

> Trolley car service is too slow. The rapidly moving "jitney bus," with its miserable accommodations, took so many thousands of passengers from the trolley cars that jitney competition had to be suppressed by law, but this legal suppression of public competition had only a temporary effect upon the decline in trolley car business.

According to the board, the experiment in 1923 of lowering fares immediately added 12 per cent to the number of passengers, but a 5-cent fare cannot be maintained, because trolley cars cannot be operated for much or any less than the present fares. Still, says the board, the fares are too high. It believes that buses will not remedy the situation, for with "their limited carrying capacity it would take so many more of them than trolley cars to do the business that they would add to the situation instead of relieving it."

With the innumerable crossings, necessary and unnecessary stops, cross-traffic and other interferences, buses cannot make the required time through crowded areas, nor expeditiously and economically move large masses of people. That is the committee's opinion. In consequence "a rapid transit system is the only solution and is necessary" to meet the demand for quicker, cheaper, more regular and more comfortable service than can be given by either the trolley car or the automobile.

It submits its plan as the only practicable solution of the local problem. In this connection it finds:

That the system can be built for less than $4,000,000.

That the gain in business and the saving of time in operating costs would be enough to pay the interest, etc., upon the cost of construction.

That it will be a great saving of money and time to the traveling public, amounting to about 6,000,000 hours annually, and this, estimated at the nominal value of 10 cents an hour, is an unnecessary tax upon the street car users of $600,000 a year, which loss can be saved by the proposed rapid transit system.

That the first unit would serve about 40 per cent of the population and would have to add only 2 per cent to the value of this 40 per cent of the assessed value of the city to pay for itself in one year.

That the information broadcasted that Seattle was the smallest city in the country and the first city west of Chicago to have rapid transit would be of tremendous advertising value to the city.

That it is the city's duty to see that the people have cheap, quick and comfortable transportation facilities.

That the longer the construction of the system is delayed the greater the loss of business, the cost of construction and the difficulty of financing.

For these reasons, or, as the committee prefers to say, "now, therefore, your committee recommends as follows":

1. That the city itself should at once proceed to provide proper facilities, or

2. That it should go out of the business and grant such a franchise to a private company, so that such company could furnish more rapid, regular, frequent and cheaper service and facilities to the traveling public; otherwise, the only way the surface roads can ultimately escape the bankruptcy court is by placing this unnecessary burden upon the already overburdened taxpayers and without any benefit to the railway department or to its patrons, or to the credit of the city.

Bus Company Contracts to Buy Railway

Fifth Avenue Coach Company Plans to Take Over 74 Miles of Surface Lines, Renews Its Plea for Bus Rights and Offers to Install Five-Cent Zone System

TWO major and several minor moves have been made involving the affairs of the New York Railways, operating 74 miles of surface lines in the Borough of Manhattan. First, the Fifth Avenue Coach Company has contracted to buy the railway. Second, control of the Fifth Avenue Coach Company, which operates the Fifth Avenue bus system, has passed from a group of Chicago capitalists to a group of New Yorkers. Third, bondholders of the New York Railways have voiced opposition to the plan advanced for the amortization of the bonded indebtedness of the railway under the plan advanced for the substitution of buses for parts of the railway system which it is deemed advantageous to supplant. Fourth, the railway made a bid to operate buses on a 5-cent zone basis. The third of these developments is the outgrowth of the others.

Announcement of agreement to purchase the control of the New York Railways Corporation by the Fifth Avenue Coach Company was made on May 23 by Hugh J. Sheeran, president of the former company. In his statement Mr. Sheeran repeated the willingness of the surface car company to surrender the perpetual franchises to some of its lines for a bus franchise and to tear up its tracks on certain streets and avenues and to substitute buses.

It appears that on May 19 the board of directors of the Fifth Avenue Coach Company, subject to the approval of the Transit Commission, ratified the agreement for the purchase of the common stock of the New York Railways. This marked the first important step in a new policy due to the passing of control of the Fifth Avenue Company from the Chicago group, which acquired it nearly two years ago, to various New York men.

These interests are represented, among others, by David A. Schulte, W. A. Harriman & Company, J. & W. Seligman, Grayson M.-P. Murphy, Charles H. Sabin of the Guaranty Trust Company, Elmer Schlesinger of Chadbourne, Stanchfield & Levy, Harry Bronner and John A. Ritchie, president of the Yellow Truck & Coach Manufacturing Company. These interests are now in control of the Omnibus Corporation, which owns the New York Transportation Company, which in turn owns all the stock of the Fifth Avenue Coach Company.

Mr. Sheeran says that if the Transit Commission shall approve of the proposed purchase the initial step will have been completed in a plan which contemplates complete and fully modernized motor coach service for the island of Manhattan.

According to him, in developing such a plan, there are certain local problems peculiar to New York city which are both of a legal and an operating character. As is well known the principal north and south streets of Manhattan are for the most part already occupied by street car tracks which were laid and are now operated under the terms of perpetual franchises. So Mr. Sheeran points out no comprehensive bus system can be operated which does not involve the use of streets where railways are now operating.

The New York Railways has such franchises on Broadway, Sixth Avenue, Seventh Avenue, Columbus Avenue, Lexington Avenue and Lenox Avenue, as well as on Spring Street, Eighth Street, Fourteenth Street, 23d Street, 34th Street, 116th Street and other

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streets. It, therefore, has franchises for street car operation on thoroughfares which would be indispensable to any comprehensive motor coach system.

Mr. Sheeran said:

> The New York Railways, by reason of its existing franchise rights, is in a peculiarly favorable position to co-operate with the city in extending and improving the city's motor coach service. It can promptly install an efficient service, operated by a thoroughly trained and expert transportation management and personnel. Its official and executive staff are expected to remain as at present.
>
> Since it is already equipped with buildings suitable for garage purposes, shops, etc., it will be in a position, because of the additional facilities at its disposal, to furnish the service in the shortest time possible, much of it at once and all of it within a period of, say, 120 days after getting a legal franchise. This applies to the lines laid out by the city authorities for Manhattan and for which the Manhattan Surface Coach Company has filed the necessary application.

In all of these proposed operations of the Manhattan Surface Coach Company the plan contemplates an arrangement by which the company will have the benefit of the experience and knowledge of the Fifth Avenue Coach Company and will receive active co-operation of the management of that company, which already has large manufacturing and maintenance shops in the city.

The plan of the Manhattan Surface Coach Company provides for a temporary service at once in the important territory of Manhattan lying west of Madison Avenue by making provision that until motor coach service can be operated in that section of the city, the motor coach lines of the Manhattan Surface Coach Company will transfer passengers to Sixth Avenue, Seventh Avenue or Broadway street car lines.

The company is prepared also, in the event the city authorities so desire, to enter into an agreement involving the substitution of motor coach operation for railway operation on Sixth and Seventh Avenues. In other words, as Mr. Sheeran has expressed it, "whatever plan would seem to the city authorities to be in the public interest, the New York Railways is prepared to co-operate in bringing it about."

As an evidence of the willingness on its part the company says it is ready at once to substitute motor coaches for street cars not only on Sixth and Seventh Avenues, but also on Columbus Avenue and on the Eighth and 116th Streets crosstown lines. Not only that, but Mr. Sheeran says that "if it be the desire of the city that all of the street car tracks in the New York Railways system shall be removed and the company be given the right to operate motor buses on these thoroughfares the New York Railways is ready to enter into negotiations to bring this about."

As the sponsors of the plan see it, the proposal provides for the inauguration of a comprehensive motor coach system without incurring vexatious and prolonged litigation which would necessarily arise were any attempt to be made to set up an omnibus service on the same streets where street car lines are now operating under conditions which do not give the owners of such property a fair return on their investment. According to them the plan would also mean the setting up of a complete and comprehensive system which the city could take over for municipal ownership and operation, if such a policy were at some future time determined to be wise.

Hardly had the ink dried on the papers that contained this statement than bondholders arose to ask, in effect, "What about us?" A spokesman for the Broadway & Seventh Avenue bondholders said that the proposal to substitute buses for street cars on Seventh Avenue had not been approved by these bondholders and that they were prepared to fight any such step. He asserted that bondholders' committees would be formed if they were not assured that what they considered their rights would be protected. The objection of the bondholders to the substitution of buses for street cars on Seventh Avenue is based on the belief that the motor vehicles would not prove as profitable on this thoroughfare as do street cars. They hold that for this reason it would be unwise to relinquish perpetual franchises in return for short-term bus franchises. There is a minority stock interest in the Broadway & Seventh Avenue Railroad which the bondholders claim will support them in opposition to the plan. The Broadway & Seventh Avenue bondholders also believe they will win support from Bleecker Street and Fulton Ferry 4 per cent bondholders and minority stockholders, Twenty-third Street Railway 5 per cent bondholders and minority stockholders and Thirty-fourth Street Railway 5 per cent bondholders. These properties in the New York Railways system have never defaulted on bond interest.

Counsel Promises Consideration for Bondholders

To this expression of concern Elmer Schlesinger, of counsel for the Fifth Avenue Coach Company, said that the matter of caring for bondholders has seemed a question so much of the future that "we have not given it much consideration." He said:

> I have not even looked into the terms of the mortgage on which the Broadway & Seventh Avenue Railway bonds were issued. We intend, of course, to meet all legitimate claims of bondholders.
>
> In previous plans for the substitution of buses for street car lines it was proposed to determine the actual value of the railway property and then to amortize bondholders' claims through payments extending over the suggested period of the bus franchises, which was for twenty-five years. This plan provided a means of discharging bond obligations without the need of a large initial cash payment.
>
> Abandonment of street car lines under the plan of the New York Railways Corporation would not take place immediately, even if the plan were to meet with official approval. If and when the time comes for satisfying the claims of bondholders they would likely be met on the basis of a fair valuation of the property involved rather than on the face value of the bonds.

As an alternative to its plan for bus and surface car operation the New York Railways has made a bid for operation of buses in Manhattan on a 5-cent fare, zone system basis, similar to one made by the Third Avenue Railway through its subsidiary.

The new proposal was disclosed by Mr. Schlesinger, who made the announcement in commenting on plans to block dismantling of surface lines outlined by a spokesman for Broadway & Seventh Avenue Railway bondholders.

As outlined by Mr. Schlesinger, the reasons for the submission of the 5-cent zone plan bid were substantially those described by S. W. Huff, president of the Surface Transportation Company. Both interests feel that a unified bus and street-car system operated on a 10-cent fare basis is most suitable for the needs of New York City, but that the zone system provides a method of establishing a 5-cent fare should this be considered indispensable.

Former Mayor John F. Hylan declared that it looked as though the machinery had been oiled to put over one part of the deal of which he talked during his last campaign. He also criticised Governor Smith for signing a bill to permit a bus company to buy the stock of a surface line company, and former Comptroller Charles L. Craig for activity in the transit situation.

Mayor Walker, in commenting upon his predecessor's statement, said:

> We are not trying to please one individual. The effort of this administration is to satisfy six and a half million people with proper transportation. Especially we are not trying to satisfy an individual who with eight years of opportunity did nothing.

As indicated previously, the New York Railways system now has approximately 74 miles of single track. The company carried 148,105,561 passengers last year. It has $37,432,472 in bonds outstanding and 184,830 shares of preferred and 90,200 shares of common stock.

Richmond Franchise Up to Mayor

The blanket traction franchise for the operation of the Virginia Electric & Power Company, Richmond, Va., is now up to Mayor J. Fulmer Bright. The Board of Aldermen, after brief discussion and explanations by Alderman Ordway Puller, chairman of the streets committee of the City Council, on May 25 adopted the paper without amendments. Alderman Joseph C. Nunnally sought to amend the section relating to an underground system for Broad Street, and Alderman Charles W. Moss desired to amend so that the traction company would be required to pave all streets from which tracks may be removed. Both amendments were lost, and then the paper was concurred in with but one dissenting vote, that of Alderman Nunnally.

The franchise provides for a 7-cent fare; the company to pave and repair between tracks and 2 ft. on either side; the company to pay 5 per cent of gross revenue as tax for the first year, this sum to diminish annually for ten years until it reached the low point of 3 per cent, to remain at that figure during the life of the franchise; the present owners to sell to the successful bidder for the franchise at a valuation of approximately $9,500,000; the city to take over, within a period of five years, the various viaducts free of cost; the elimination of duplicate lines, and extension of others, the extension of the Seventh Street tracks from Clay to Leigh Streets (one block), for possible extension of the interurban (Richmond and Petersburg) line to Seventh and Leigh Streets, as the terminal.

The concurrence in the paper by the Board of Aldermen, the Common Council previously having adopted the ordinance, is the culmination of long-drawn-out discussion. The franchise as finally agreed upon is considered by all concerned as a compromise. The streets committee conceded certain points and the traction company conceded many.

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The result, it was shown, received the approval of every member of Common Council and eight members of the Board of Aldermen.

June 2 has been set as the date for consideration by the streets committee of the City Council of the new bus ordinance, under which the Virginia Electric & Power Company will operate its fleet of automobile passenger buses. General provisions of the measure have been agreed to, it is understood, and it is hoped to have it operative within a short time. The bus service will be operated in co-ordination with the electric car routes.

Traction Discussion Renewed in Chicago

Service at cost in the high point of the present deliberations of the committee on local transportation of the City Council of Chicago with regard to the drafting of a new traction and subway ordinance.

Believing that the scheme would encourage economic management of the surface and elevated lines, tentative approval has been given to a plan brought forward by Corporation Counsel Busch which would reduce the rate of return whenever fares are increased and increase the return when fares are decreased. In order to determine the cost of service, 2 per cent of the valuation of the surface lines properties, or approximately $3,200,000, would be set aside with the initiation of the plan. This fund, called a "barometer" or stabilization fund, would take care of all operating deficits. Should the fund fall below 1 per cent of the valuation, fares would be increased 1 cent automatically. Likewise, if the fund should reach 3 per cent of the valuation, fares would be automatically cut 1 cent.

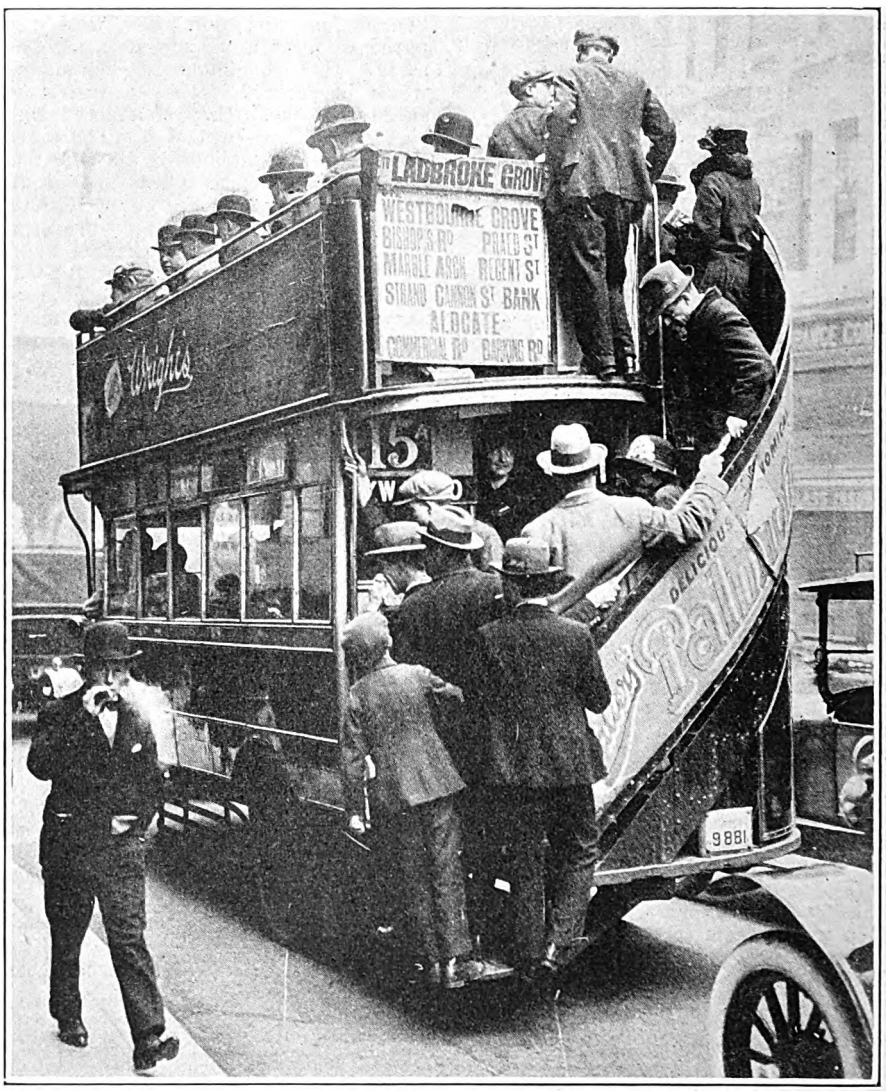
The committee is definitely agreed that before new franchises can be granted to the surface and elevated lines, unification of service must be brought about. Because of the varying maturity of the outstanding traction securities, however, consolidation of ownership will not be demanded.

Before the committee adjourned on May 25 to await the appearance of representatives of the companies, approval was given to the recommendation of Major R. F. Kelker, the committee's engineer, that the surface lines be permitted to reduce the height of their rails from 9 in. to 7 in. In return for this privilege, which Major Kelker declared would result in large savings in construction costs, the surface lines would be required to pave their rights-of-way a width of 18 ft. instead of 16 ft. In addition, the committee concluded that eight-tenths of 1 per cent of the gross revenue of the companies should be set aside for payment into the amortization fund.

To control the operation of the traction lines under the projected ordinance, the committee has also indorsed the formation of a committee of five members, each of whom shall be appointed by the Mayor for a term of five years. Qualifications for membership, it was decided, shall provide only that the appointees be persons of business ability and public spirit and in no way connected with the traction companies.

General Strike Failed to Halt Service in Great Britain

Independent Bus Operators and Volunteer Railway Workers Provided Transportation Facilities Sufficient to Prevent Tie-Up During Recent Industrial Conflict



Independent Buses Operating in London During the Strike Were Overcrowded by Non-Striking Employees Anxious to Get to Work

TRANSPORTATION service throughout Great Britain was much impaired during the general strike, May 4 to May 11, but it never was completely halted. In London particularly, and to a lesser extent in other cities, the facilities provided by the independent bus operators were an important asset to the public in the first days of the strike. Volunteer drivers were quickly secured by the established bus undertakings, however, and extensive operations resumed before many days elapsed. Similarly, volunteer workers were instrumental in restoring service on the rapid transit lines and on the electric and steam railroads. Tramway service was hard hit, but the return of many trainmen eventually permitted the resumption of a considerable part of the service.

In the past there had been much talk about a general strike in England, but the call issued on May 4 by the executive council of the Trades Union Congress in support of the coal miners was the first actual attempt to carry out the threat. Both rail and road transport personnel were seriously affected. Other industries involved, besides that of coal mining, which was the underlying cause of the trouble, were iron and steel, building construction, printing, and to some extent engineering and electric power generation. The total number of workmen on strike was estimated between 3,000,000 and 4,000,000.

In fear that some such effort might be made, the government had prepared in advance and was ready with an organization for the transportation of food supplies by rail and road. Passenger transportation services had not been so thoroughly arranged and were seriously disrupted at first.

When transport stopped, the problem

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of getting to and from work was much more serious in London for those not on strike than it was anywhere else in the country. This was because of the greater size of the city and the consequently greater distance between homes and places of employment. The main thoroughfares leading to the central business area were thronged morning and evening with hundreds of thousands of people going to and returning from work. The greatest number were on foot, but many had bicycles, and an astonishing number had motor cars. Never before had such multitudes of automobiles been seen in London streets.

The large Chelsea power station of the Underground railways was shut down and the whole system became dead. In a few days, however, sufficient men were found to start up the station again, and limited services were running on several of the tube lines. The London tramway and bus services were completely closed except for the independent bus operators who continued to run despite threats from strikers. The London General Omnibus Company got some buses on the street by the end of the week and some of the suburban tramway authorities began to run cars. Riots and sabotage were threatened when the London County Council attempted to operate its cars.

By Monday, May 10, a week after the strike began, a marked improvement had occurred in the means of passenger transport in London. There was no general breakaway of strikers, but the Underground railway companies and the London General Omnibus Company had been busy training volunteers to be drivers and conductors of trains and buses, and others for the duties of operating the Chelsea power station. In the last-mentioned work many engineering college students were quickly able to render valuable assistance. There were several hundreds of L. G. O. buses on the streets and the number of independents had also increased over the previous week.

Many special constables were recruited for whole-time work with pay, a large proportion of whom were employed for the protection of tramcars and buses from interference by strikers. In many instances a policeman or special constable sat beside the driver, but

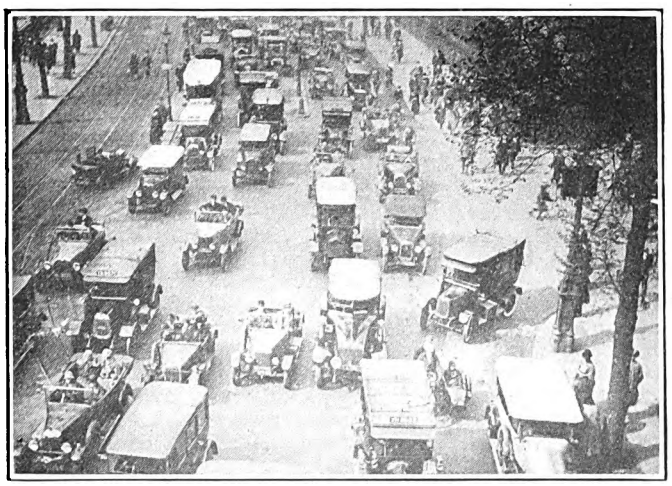
A Group of Cheerful Volunteer Bus Operators Recruited by the London General Omnibus Company

cases of malicious interference were not numerous. The underground railways returned to something like normal services for a large part of the day. The London County Council Tramways, however, showed little signs of revival, as earlier attempts to bring out the cars had resulted in broken windows. Considerable rioting took place at Glasgow, Hull and some other industrial centers. In all districts where prosecutions took place for interfering with traffic or rioting the magistrates inflicted severe sentences of imprisonment.

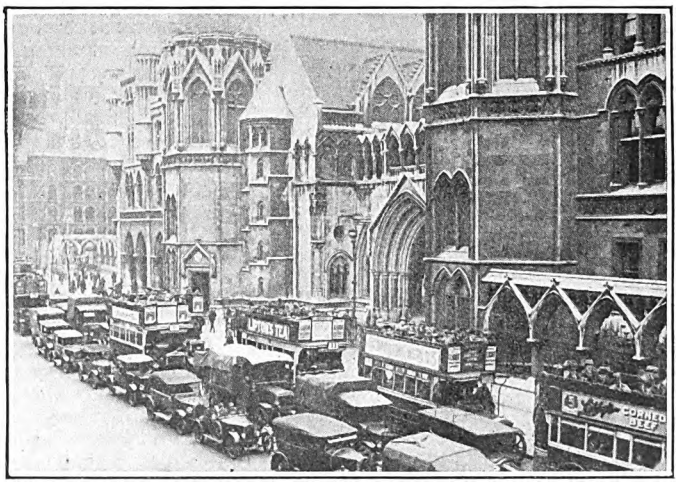
The suburban electrified lines of the large steam railroads also got to work and, so far as electric railways and buses were concerned, the London travelers' troubles were sensibly diminished. Elsewhere tramway and bus service began gradually to be restored.

On Tuesday, May 11, bus service in London was still further increased. The London General Company for the time being dropped graded fares and displayed on its buses the notice "Fare 3d. for any distance." The County Council tramway system remained dead, but in the provincial cities many tramway and bus employees returned to work. Normal services were practically restored in Portsmouth, Bristol, Newport, Cardiff and other towns, largely on account of the return of men, but to some extent also through the agency of volunteers. In various towns warnings were issued to tramway employees that if they did not return to duty by an early date they would be discharged. Of even more importance in inducing the men to return, however, was an official announcement signed by the Prime Minister declaring that every man who did his duty by the country and remained at work or returned to work during the crisis would be protected by the government from loss of trade union benefits, superannuation allowances, or pensions. The government would take whatever steps were necessary, it was said, whether Parliamentary or otherwise, to accomplish this purpose.

On May 12 the strike was called off by the Trades Union Council and two days later terms were arranged for the return to work of the employees of the London underground railways, the London tramways and the London General Omnibus Company and its associates. At first there were rumors that men were only to be taken back at reduced wages, but these proved without foundation. It was announced, however, that the employers made stipulations similar to those made by the steam railway companies, that the men would be taken back as soon as traffic warranted and work could be found for



More Motor Cars Were Seen in London Streets During the Strike than Ever Before. This Shows Victoria Embankment Looking from Waterloo Bridge at 10:30 A.M.



After a Few Days the London General Omnibus Company Was Able to Resume Partial Operation. Traffic Passing in Front of the Law Courts During the Morning Rush

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them. It was also arranged that volunteers who had helped the services in their emergency would continue to be employed should they so desire.

The electric railways, both underground and suburban, did not get back quite to full services at the week-end, but on the 15th something like normal traffic was restored. The London County Council tramways, resumed operation on some routes on the afternoon of the 14th, and on the following day were coping with public demands.

Elsewhere in England and in Scotland in a number of large towns where a certain proportion of tramcars and buses had been running during the strike communications were rapidly improving. In other places there were local disputes as to terms of reinstatement, and a condition that only non-union men would be employed was spoken of. Everywhere, however, there was every prospect of normal work being speedily resumed.

During the strike the order issued some time ago under the London traffic act reducing the number of bus trips on certain routes was not enforced. Although intimidated by the strikers, the so-called pirate buses continued running, and thereby earned the gratitude of the public. It is thought that this may stand them in good stead when the restriction question comes up again.

Enabling Act Passed in Massachusetts

Governor Alvin Fuller of Massachusetts on May 26 signed the bill which will enable the New York, New Haven & Hartford Railroad to acquire and hold the securities and properties of the New England Investment & Securities Company, the Springfield Railways, the Springfield Street Railway, and the Worcester Consolidated Street Railway. The amendment proposed by the Governor when he returned the bill to the Legislature was compromised and rewritten to provide that the act to become effective must be accepted by three-quarters of the cities served by the railway companies. The municipalities on the lines number 49.

Need for Changes in Louisville Grant Stated

The Louisville Railway, Louisville, Ky., published a page advertisement on May 22 in the Louisville *Herald-Post*, carrying a letter signed by President J. P. Barnes, addressed to Mayor A. A. Will. Mr. Barnes said the ad would be followed by a series of six letters which will be published in the newspapers, starting on May 24. He said:

You are already familiar with our situation regarding extensions to the transportation system of Louisville. A very considerable pressure has been brought upon us in many directions to make extensions, and we find ourselves unable to do so, because the investors in public utility securities are unwilling to advance money to the Louisville Railway for extensions, so long as the restrictive provisions of the present ordinance obtain.

Specifically, what the investor requires is a security equivalent to that which he finds in the offers of companies under federal regulation, or under the regulation of the 43 states which have public utility laws. All of these jurisdictions base rates for public utility services on a reasonable return on a fair value of the property devoted to the public use. This basis guards as effectively as anything can against the emergency conditions which might arise in an economic crisis like the one accompanying the World War, and to this extent the investor is in a position to demand, and he does demand, protection for his investment in public utility securities.

We feel that the modification of the railway company's ordinance in this sense would be of enormous benefit to the system in permitting us to command funds for needed extensions, and that the control over rates of fare which could and should be retained by the city, subject only to a reasonable return rule, would amply protect the public against extortionate fares. There is no present necessity for an increase in fare, nor do we see a prospect of such necessity. It is merely the unforeseen against which the investor demands protection.

We feel that the retarding of the city's growth through our inability to make transportation extensions is very considerable and of very great importance, and have therefore prepared a series of six letters, which will be published in the newspapers commencing next Monday. We have tried to state the situation concisely, correctly and convincingly.

We feel this matter to be charged with a public interest and concern so grave that we are making this preliminary letter to you open so that the public may not be uninformed as to any step of our program.

Strike in Akron Called Off

Former Employees Sue for Peace—Accept Individual Contracts and Return Under Old Working Conditions—Buses Commended—More Car Lines to Go

CARS are again running as usual on the city, suburban and interurban lines of the Northern Ohio Power & Light Company, Akron. The strike is over. It was called off on Saturday afternoon, May 22, at the suggestion of Amalgamated officials, and complete service was resumed Sunday, May 23.

The strikers who were acceptable to the company were taken back as individuals. They signed individual contracts and accepted seniority rights behind the men working Saturday, May 22, at the same pay and under the same working conditions that existed May 1, the date the strike was called.

When the strike was called off the company had established complete city service in Akron and Canton and interurban service between Akron and Massillon. Many men had also been employed for use on the Akron-Cleveland division and the Akron-Warren-Alliance lines commencing on May 24.

The strike was called off following a request on May 21 from W. K. Jones, an old employee, that the company state the terms upon which the striking employees acceptable to the company would be taken back. Jones was supplied with the information and then suggested a vote on the proposition. The vote showed a majority in favor of ending the strike and accepting the terms laid down by the company. Many new men have been hired since May 1, so the company is unable to use all of the former employees who are acceptable. They are re-employed on a basis of their past record.

As an aftermath of the strike four strikers are to be prosecuted on a federal charge of attempting to block United States mail. The men attempted to stop a Canton-Akron train carrying mail Thursday, May 20, near North Canton. Three other strikers are being sought on dynamite charges. All prosecutions will be pushed to the limit.

When the strike was ordered on May 2 by Edward McMorrow, vice-president of the Amalgamated Association, the organization "went to bat" against the most powerful bus system ever gathered together in a city of 200,000 and against public sentiment, as well as one-third of the Akron city employees who were not members of the union.

In five days Akron city service had been increased from the skeleton system in operation Sunday, May 2, to normal. The company then turned its attention to Canton, and in four days more had restored practical normal service there despite the laxity of cooperation on the part of the police department.

Tuesday of last week interurban service began to be restored and the climax of the strike followed shortly, with a series of dynamitings, minor riots in Canton and lesser disorders in Massillon, where no attempt was made by the police to protect trainmen who were working. The company went into the federal court Thursday and began injunction proceedings against the Amalgamated Association, its officers and members. Then came the arrest of the rioters.

All attempts toward mediation were rejected by the company. This stand met with general public approval. Hugh D. Friel, representing the Department of Labor, and Herman R. Witter of the State Industrial Department were the most active in the work of trying to effect a reconciliation. One Congressman tried his best to bring about a conference, as did four ministers and two city Mayors. All failed and the company sat tight in its determination not to deal with the union or union representatives. It remained for an employee long in the service of the company to secure the best terms.

The aces of the Amalgamated official board were called to Akron during the strike. Edward McMorrow, veteran strike leader, was the first on the ground. Then came Albert Jones, another experienced vice-president, and lastly came Patrick J. O'Brien, also a vice-president of the Amalgamated. Public sentiment was so strongly in favor of the company in its determination to break union domination that none of these men could get a foothold. They were rebuffed at every turn. Prominent residents of Akron and Canton called company officials on the telephone and wrote letters urging the company not to compromise with the union. "We have suffered enough from strikes in the past; end this one right," was the public stand. In Akron city and Summity County the authorities preserved order from the first day. No crowds were permitted to congregate in the street and an attempted parade of union men and women was blocked.

The people served by the city lines of the company have suffered great inconvenience from strikes during the

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last twelve years. Always the Amalgamated Association, through public aid, has forced a satisfactory union compromise. This time the union found a different public attitude, with the result that the union is today a wreck.

The strike has shown the company that a more satisfactory transportation service can be given along certain car lines with buses. It is, therefore, possible that the Bowery, North Howard and Grant Street car lines will soon be discontinued. It is probable, too, that the Massillon City system will soon give way to a bus system. The company has not been hurt materially by the strike. Little damage was done to equipment, while bus revenue has almost kept up to the car revenue. The strike expense was small and the general feeling is that so far as value is concerned the result far exceeds the cost.

No strike breakers were employed. Practically all men who operated cars were either regular employees or men who resided in Canton or Akron. A few experienced men who of their own accord came to the property from other cities were employed.

Wage Negotiations Under Way in Boston

Negotiations are in progress over a new wage agreement between the Boston Elevated Railway, Boston, Mass., and the union. The old agreement expires on July 1. The conferences are being held at the general offices of the company. John H. Reardon, general representative of the Amalgamated Association, is assisting the carmen's committee and Edward Dana, general manager of the Boston Elevated, is sitting with the Elevated board of trustees in these negotiations. They have not proceeded far enough to authorize the publication of any of the terms they are discussing.

Present Scale Accepted in New York State

Employees of the New York State Railways in Rochester, Syracuse and Utica, voting May 24, decided by an overwhelming margin to accept the company's proposal to renew the present wage and working agreement. At a previous poll the proposition was rejected by about 250 votes.

Following rejection bargaining was resumed between the workers' representatives and company officials, which resulted in favor of renewal by more than 500 ballots. The 1925 contract expired May 1. The wage scale is to be renewed for another year.

Union officials had sought an increase of 10 cents an hour.

Rochester employees were especially insistent on the wage boost, mainly because of the fact that the company on Jan. 1 was granted a 1-cent fare increase in that city. Applications for an increase form 7 to 10 cents in Utica and Syracuse are pending before the Public Service Commission.

President Hamilton maintained that the railway's revenues did not permit of any wage increase, pointing out that any additional revenues derived from fare increases were offset by costs of the improvement program.

Offers Amendments to Milner Plan

Agreement With Prof. Riggs and Engineers Gives Control to Community Traction—Ordinance May Be Submitted

A supplementary report furnished to the city of Toledo by Prof. Henry E. Riggs of the University of Michigan outlining points of agreement between himself and engineers representing Henry L. Doherty & Company, New York, provides a basis for amendments to the Milner franchise ordinance which may be submitted to the people of Toledo at the August primaries or at a later special election. The agreement will be drafted into the form of an ordinance by city legal authorities.

The Community Traction Company is given a monopoly of street railway and bus transportation within the city limits. Definite plans are made for the scrapping of some traction lines, reconstruction of others, extension of several lines through feeder buses, the operation of fifteen bus lines eventually, and the complete rehabilitation of the company property.

It is recommended that the board of street railway control be given full authority over transit affairs and that the fares be automatically regulated by retention of the stabilizing fund. It is proposed to retain the present fare basis of 10 cents cash, three tickets for 25 cents and 1-cent transfer charge.

It is estimated that $2,860,120 would be required for the rehabilitation and new construction program over a five-year period. The engineers apportioned $1,323,748 for track work and $1,051,361 for equipment. In this latter item is $880,000 for 110 new buses to be acquired if possible on a rental basis, thereby requiring a minimum of actual capital outlay. The company would be relieved of all paving charges, and even the city would undertake to bear the cost of foundation work under tracks. The rehabilitation program would be worked out in connection with city repaving.

A concession in the power rate which would yield estimated savings of $20,000 annually has also been agreed upon by engineers. A correction for the price of coal would also be effected.

The report does not cover any change in capital value of the company, but suggests suspension of the sinking fund charges which have weighed heavily upon the company in the last five years. In its place a depreciation reserve would be set up equal to 4 per cent of the capital value each year, and when the credit balance was equal to 8 per cent of the capital value a return would be made to the usual sinking fund payments or 1½ per cent annually after 20 per cent of the capital has been retired by the sinking fund.

The engineers have estimated that with increase in population, decline in riding habit, added cost of operating the larger system and offsetting economies there would be an increase in net revenues of about $100,000 a year under the rehabilitated system. In the economies counted on there is $250,000 to be saved from eliminating bus competition, $150,000 from the extension of one-man cars, $20,000 from decreased power costs and other savings to bring a total of about $568,000 a year.

The entire report will be laid before the railroad committee of City Council by Mayor Fred J. Mery so that some concrete action may be taken at the next session of the Council.

Local Regulation in Illinois Nullified

Complete control of all utility operations and practices in the state of Illinois will henceforth rest in the hands of the State Commerce Commission, by virtue of a general order issued on May 21, in which official cognizance is taken of two recent decisions of the Illinois Supreme Court nullifying all city and village ordinances relating to the operation of public utilities within corporate limits.

In both decisions the state tribunal ruled the Illinois utility act repealed by implication certain police powers conferred on municipalities by the cities and villages act of the state of Illinois "for the protection, comfort and safety of the public and the regulation of the operation and practices of public utilities in relation thereto."

One of the decisions was a crossing protection case. In the other, the court ruled that the candlepower of street car headlights was purely a matter for the commission to decide and entirely out of the jurisdiction of the city.

Heretofore, the commission has left to the municipalities the regulation of utility operations, such as speed of cars, hours of service, etc., but it appears from the decision of the court that the commission must assume complete control of utility operation whether inside or outside cities or villages.

Federal Court Permanently Restrains Five-Cent Fare Order

A permanent injunction which perpetually restrains the Illinois Commerce Commission and the city of Chicago from enforcing the commission's orders for 5- and 6-cent fares on the Chicago Railways was entered in the Federal District Court at Chicago on May 19.

Making permanent the temporary injunction issued in 1922 enjoining the 5-cent fare and later the 6-cent fares which the commission attempted to introduce, the decree upholds the findings of Master in Chancery C. B. Morrison that these rates are confiscatory and the orders, therefore, unenforcable. The 7-cent fare which was declared the only legal rate will remain effective for the time being.

Thousands of street car passengers who have been holding transfers in the hope of obtaining a rebate were incidentally notified that they might throw them away without incurring any loss.

Had the court sustained the commission's orders, the Chicago Railways would have sought relief from the burden of paving and street cleaning costs and from paying the city 55 per cent of net earnings as prescribed by the present franchise ordinance.

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Connecticut Men Accept Two-Cent Increase

The wage troubles of the railway and bus employees of the Connecticut Company, New Haven, Conn., were finally settled for another year by the employees accepting a compromise suggestion offered by the company for an advance of 2 cents an hour in wages. This makes the rate 62 cents an hour for two-man car operators and 67 cents an hour for the operators of one-man cars. The proposal of an increase was accepted by the men on all divisions except the Hartford Division. The increase will become effective June 1. In granting it the company also grants an eight-hour working day within a period of eleven hours.

On May 10 the employees petitioned the company for an increase of 15 cents an hour and the company in turn replied to the demands of the workers and offered an increase of 2 cents an hour. The matter was taken up by the union and it was decided to submit the offer of the company to the workers themselves to settle it by vote.

Contracts for Toledo Interurban Not Yet Renewed

Contracts under which the interurban lines use the tracks of the Community Traction Company, Toledo, Ohio, expired on May 1 and as yet no conferences have been held regarding renewal of the agreements. Commissioner E. L. Graumlich has called attention of company officials to the necessity of increasing the rentals to reimburse the company for delays and heavy maintenance costs in the downtown district.

During the last few weeks a new traffic control system has been studied for use in the downtown district to facilitate the movement of both street cars and automobiles. The new leasing contract may be held up pending the solution of this problem. Moreover, there is a possibility that a shorter loop for the interurban lines will be arranged. At the instance of the Toledo Automobile Club the city officials are making a survey to determine what effect stopping of interurbans at the city limits would have on elimination of congestion of traffic on downtown streets.

Franchise Talk Renewed in St. Louis

Except for the settlement of two points at issue city officials of St. Louis, Mo., and officers of the St. Louis Public Service Company, St. Louis, Mo., are agreed on the terms of the service-at-cost franchise under which the new company will operate when it takes over the property of the United Railways after foreclosure.

The chief point at issue is the mill tax levied against fares. The United Railways is in arrears $3,000,000 on this tax. It has not been decided how this sum shall be paid off and whether the city shall continue to collect the tax. The reorganization committee has admitted the outstanding obligation to the city, but desires to pay off the debt over a period of years.

The new company would eliminate the tax as a burden on car riders—the class least able to pay any taxes—but the city pleads necessity, pointing out that it has reached the constitutional limit on direct taxes, $1.35 on each $100 valuation. It needs the $600,000 raised annually through the mill tax and prefers to let the car riders pay rather than impose other indirect taxes on the citizens.

If the city insists that the tax continue in effect company officials have suggested that it be paid only if a sum sufficient to do so remains in the treasury after the company has paid off every other obligation and paid itself a return on a fair valuation.

The other point at issue is whether a clause in the new ordinance shall provide that should any part of the new franchise ordinance be declared illegal other clauses shall not be affected, and the franchise shall continue in full force and effect.

Ten Cents in Salt Lake City

An increase in cash fares to 10 cents, with three tokens for 25 cents, was allowed the Utah Light & Traction Company, Salt Lake City, Utah, in a decision of the Public Utilities Commission rendered on May 19. In the same decision the commission denied the application of the company for permission to increase student commutation tickets from 50 for $2 to 40 for $2. The ruling also made permanent the weekly pass of the company. Heretofore the use of the pass has been only a temporary arrangement. The commission ruled that the price of that pass should remain as now, $1.25 for one zone, $1.75 for two zones and $2.25 for three zones. Another part of the order stated that the railway was to sell books of thirteen commutation tickets for $1. The new tariff became effective on May 23.

In its application to the commission for permission to raise its rates the company asked for a 10-cent cash fare, three tokens for 25 cents, the increase on student tickets as stated, the elimination of books of commutation tickets and the keeping of the weekly pass at present prices.

The commission in arriving at its decision declared that it was a well-established principle that fares should be commensurate with the cost of operating a public utility, and paying a fair return to those who had risked their money to provide facilities for rendering public utility service. The commission held that car fares bear a direct relation to efficient service, "and efficient service, in the last analysis, means all the comfort and convenience to a car rider that is generally desired." The commission in its conclusion stated that "under present conditions and circumstances the new rates should prove sufficient to enable the applicant to provide adequate and efficient street car service."

The hearing before the commission on the application lasted a week or more, and the case was then held open until April 30, on which date final arguments were heard. The commission ordered the suspension of the proposed rates until May 20, or such time as it should require to decide the case. Most of the objections were against the maximum fare and not against the idea of an increase.

Negotiations for New Franchise in Kansas City Proposed

Five points will dominate the negotiations for a new franchise for the Kansas City Public Service Company, the successor under foreclosure to the property of the Kansas City Railways. They are:

Term of franchise.
Service at cost.
Inclusion of bus franchise in rail grant.
Paving and street cleaning.
Extensions.

It has been made plain that the company would not insist upon the proposed service-at-cost plan, but would present the plan in an effort to convince the city it was the modern and most satisfactory way of fixing fares.

Elimination of the clauses in the present franchise requiring the company to pave between the tracks and 18 in. on each side of the tracks, and to pay for street cleaning on the rights of way will be asked by the company.

A new 30-year franchise, instead of an amendment to the present franchise, is desirable, because it would aid in refinancing the company.

Inclusion of the bus franchise will be asked as a means of stabilizing the company and to aid in establishing the company on a sound basis.

Present Wage Scale in Davenport Continued

The Tri-City Railway, Davenport, Iowa; Moline and Rock Island, Ill., has signed contracts with its operators, continuing the present scale until June 1, 1927, and indefinitely thereafter until either party opens negotiations by giving 30 days notice. The scale graduates from 54½ cents an hour for three months men, 56½ cents for six months men and 58½ cents thereafter.

A few minor concessions were made in working terms.

Car Line at Fort Dodge to Be Restored

Residents of Fort Dodge, Iowa, have organized the Street Railway Operating Company and are making plans to operate the one local car line in the city with equipment leased from the Fort Dodge, Des Moines & Southern Railroad. The new company has filed articles of incorporation with the Recorder of Webster County. It expects to be operating cars in the city within 30 days.

Officers of the company are: Henry Schultz, president; Jay Pooler, vice-president; Harry Davidson, secretary, and Mrs. Fred Dahleen, treasurer. Directors are: William Hay, Fred Carlson, Andrew Braso, George Leslie, A. E. Newsum and the officers.

Five hundred shares of stock at a par value of $10 will be sold to residents in the districts served by the line. Backers of the move predicted that the stock would find a ready sale.

The car line connects the business section of Fort Dodge with the two railroad stations and runs out to Gypsum City. It is about 4 miles long. Service was discontinued on Nov. 14, 1925, by the Fort Dodge, Des Moines & Southern Railroad on the ground that the line was losing money.

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Paul Renshaw Gets Utility Prize

Paul Renshaw, advertising manager of the Memphis Power & Light Company and the Memphis Street Railway, Memphis, Tenn., was winner of the national prize awarded for the best contribution on the subject of public relations in the electric light industry at the Atlantic City meeting.

The prize is a cash award of $250, donated by Martin J. Insull, president of the Middle West Utilities Company.

Mr. Renshaw's paper discussed the subject from the threefold phase of "why public relations are conducted," "how they may be successfully promoted," and "results that may reasonably be expected."

Each contestant in the competition was allowed the latitude of personal judgment in the manner of treatment, and the committee's award was made on the basis of which article they considered best in its treatment of the entire subject.

Scranton Routes Being Studied

Traffic engineers employed by the Fitkin interests of New York, which control the Scranton Railway, Scranton, Pa., and who are now engaged in a study of Mayor E. B. Jermyn's proposal to reroute trolley cars in the central city, are expected to complete their report soon. The report is to include a cost estimate. The Mayor's scheme calls for the elimination of service by electric railway on Washington and Wyoming Avenues and Linden and Spruce Streets. The tracks will not be removed, however, until the new trolley routing system has been thoroughly tried out.

News Notes

Guess Traffic—Prize a Pass. — The Tacoma Railway & Power Company, Tacoma, Wash., is offering weekly passes as prizes to those who make accurate guesses of its weekly traffic. Only one guess is allowed to each person. A recent first prize was won by Mrs. Herman Shroeder. Her guess was 447,000 and the actual number of rides was 447,263.

Seeks Eight Cents in Hannibal.—An increase in railway fares from 6 cents to 8 cents is sought by the Hannibal Railway & Electric Company, Hannibal, Mo. In an application filed on May 15 with the Public Service Commission the company declared that competition of "unregulated and unrestricted" bus lines had resulted in heavy financial loss to the company and threatened suspension of service. The Hannibal company charged a 5-cent fare until Feb. 1, 1924, when the fare was increased to 6 cents by the Public Service Commission.

"Personal Touch" Successful in Evansville. — Gus Muhlhausen, vice-president of the Evansville Suburban & Newburgh Railway, Evansville, Ind., has found that the "personal touch" pays in the traction business. His interest in community development has resulted in traffic increases. He assists the Boonville Business Men's Association in staging an auction and bargain day in Boonville twice a month and on these days the Boonville traction lines haul a large number of passengers into the town. Two of these auction and bargain days have already been held and they have proved very successful.

Rates in Kansas City Extended.— The Public Service Commission on May 15 issued an order extending the present rates of the Kansas City Railways, Kansas City, Mo., for six months from May 18.

Temporary Increase Allowed.—The State Public Service Commission has granted the Wheeling Public Service Company, Wheeling, W. Va., a temporary increase in rates between Wheeling and the "S" bridge at Elm Grove. The increase becomes effective on June 1. The new fare schedule authorizes a new zone, which will make the fare between Wheeling and Elm Grove 15 cents. The new zone extends from Wheeling proper to Glenwood, with a cash fare of 8 cents or ticket fare at 6 cents. The third zone will extend from Wheeling Park to the "S" bridge.

Would Extend Freight Service.—The Oklahoma Railway, Oklahoma City, Okla., is planning to extend its freight service to Piedmont. The proposal includes the building of a track between Piedmont and the El Reno line. It is estimated that the work will require about $90,000. It is because Piedmont is now without a rail connection with Oklahoma City that its citizens are desirous of obtaining the fast freight service. They have already obtained the approval of the Oklahoma City Chamber of Commerce.

Increased Fare Sought.—The Philadelphia Railways, connecting Philadelphia, Eddystone and Chester and operating under agreement the Essington Division of the Chester & Philadelphia Railway, has applied to the Public Service Commission for a new tariff which provides for a substantial increase in existing rates of fare. The present rate between Third and Jackson Streets, Philadelphia, and Hog Island Junction, at the west side of the Penrose Ferry Bridge, is 7 cents. Under the new schedule it will be 10 cents. Similarly the rate from Hog Island Junction to Bow Creek will be increased from 7 cents to 10 cents. The Philadelphia Railways was incorporated under the laws of Pennsylvania in 1911, as successor to the Southwestern Street Railway, the property of which was sold under foreclosure on April 21, 1911. The property was taken over on Dec. 10, 1918, by the Emergency Fleet Corporation, but on June 1, 1922, was returned to the company.

Prefer Fifteen-Minute Schedule. — The trolley line between Worcester and Leicester, Mass., is operating on a fifteen-minute schedule following a poll which was taken to determine the sentiment of the Leicester and Cherry Valley commuters. The poll resulted in 141 votes in favor of the fifteen-minute schedule, while three voted for the old hour schedule. Twelve riders signified they were indifferent. The voters were called upon to state their preference of "one through car" once an hour or the fifteen-minute schedule. A tabulator was assigned to ride each through car and determine the sentiment.

Summer Excursions Planned. — The Indiana Service Corporation, Fort Wayne, Ind., will again run excursions this summer to Niagara Falls, N. Y., and Toronto, Canada. This plan was announced by J. A. Greenland, general passenger and freight agent. These excursions are run over electric lines to Toledo, Ohio, and the rest of the trip is made by boat.

Refuses Franchise Renewal. — The East St. Louis, Ill., City Council by a vote of three to two recently refused to renew the Third Street franchise of the East St. Louis Railway. A week prior to the vote the Council ordered the company to take up its tracks on Third Street between Broadway and Missouri Avenue. The company claimed that the tracks on Third Street were necessary for the maintenance of good street car service in the city. The railway has appealed to the Illinois Commerce Commission.

Will Extend Line if Workers Desire It.—Questionnaires are being circulated among employees of the larger River Road industries at Buffalo, N. Y., by the International Railway to determine the advisability of extending the company's traction service on this line. The plan was evolved by B. J. Yungbluth, president of the International Railway, as a guide to the schedule department of the company. About 15,000 workers are employed in the large River Road industries north of the Buffalo city line. Increased night work in these mills makes an extension of the night service on the River Road traction line a necessity, but the company is anxious to determine how many workers would avail themselves of the company's facilities and how many use motor cars to and from work. Already the company has improved its service on the line and additional service also is planned.

Arbitration to Decide Wages in Peoria.—Representatives of the trainmen, carhouse men and shop employees of the Illinois Power & Light Corporation stationed at Peoria, Ill., have agreed with representatives of the company on wage arbitration. Henry Mansfield will represent the employees and E. E. Soules the traction company. Both served on a similar board last year. The trainmen have asked a 10-cent increase over the present wage of 55 cents, which is also paid to the bus operators. Shopmen are on a sliding scale.

Commission Orders Traffic Control.— Full traffic control on the Oregon Electric Line and the River Road at Island Station will be established, according to an order issued by the State Public Service Commission. Trains may pass this intersection at a speed of only 10 miles and motor traffic must come to a complete stop. The Portland Electric Power Company must also construct at its own expense stop signals on each side of the track at this point, and shall also erect on each side of the approaches of this crossing at a distance of 50 ft. therefrom stop posts of the usual standard with black and yellow stripes, equipped with red lights or similar reflective devices that offer a warning at night.

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Recent Bus Developments

Interstate Suit Over Until Fall

So far as the United States Supreme Court is concerned that angle of the litigation between the Interstate Buses Corporation and the Holyoke Street Railway, Holyoke, Mass., already appealed to it will remain in *status quo* over the summer holidays. The court on May 24 denied the motion of the Buses Corporation for an immediate restraining order, but granted its motion to advance hearing of the case on its merits and fixed the date as Oct. 4.

The Interstate Buses Corporation, a Connecticut corporation, operates, among others, a line of passenger buses between Hartford, Conn., and Greenfield, Mass. For a portion of this route its vehicles parallel the tracks of the Holyoke Street Railway. That company, charging unfair competition, sued the bus company in a Massachusetts state court. Among other things it alleged illegal operation in that the bus corporation had not complied with the Massachusetts law of 1925 requiring that where intrastate business is done by a bus company it shall secure license and permit, failure to do so being termed a nuisance. The bus corporation had this suit removed to the United State District Court. The president of the street railway company thereupon secured warrants against various drivers and other employees of the bus company and a number of them were fined in court.

The federal district court granted an injunction to the railway company until the bus company complied with the state law and dismissed a cross-bill filed by the bus corporation seeking an injunction against arrest of its employees. From dismissal of its cross-suit the bus company appealed direct to the Supreme Court, and it was on this that the rulings on the motions were made on May 24. The bus company has appealed to the U. S. Circuit Court of Appeals from the injunction against it, being unable to carry this case to the Supreme Court direct from the district court.

I. C. C. to Inquire Into Bus Competition Pending Legislation

An investigation of bus and motor truck operation by the railroads of the country and of bus and truck competition with the railroads was ordered by the Interstate Commerce Commission on May 25.

In ordering the investigation the commission said it appeared that the operation of buses and trucks by or in competition with the common carriers of the country was increasing and likely to increase further. Therefore it was concluded the commission should take cognizance of this form of transportation and its effect on the railroads in traffic handled and in revenues or rates.

Issuance of the order follows closely on the determination of the Senate interstate commerce committee to table for the present session the bill putting motor trucks and buses engaged in interstate traffic under the jurisdiction of the commission.

The idea of the commission is to make an independent investigation of the facts for use as a background in the adjudication of the pending cases in which motor transportation is a factor. Public hearings will be held in Washington and other cities.

Steam Railroad's Plea Denied

Buses run in the interest of the Boston & Maine Railroad will not be permitted to compete with the railway lines of the Cumberland County Power & Light Company, Portland. The Public Utilities Commission would not grant the Boston & Maine Transportation Company a permit to run the buses. At the hearing the railroad disclaimed any wish to compete with the trolley lines. It explained that it desired to eliminate train stops at several of its stations on the route to Old Orchard. The commission felt that no restrictions that might be imposed would prevent some competition and that the replacement of train service would be disastrous to the communities served. This is another instance of a ruling adverse to an applicant seeking to establish bus service in Maine that might prove to be competitive.

Sightseeing Subterfuge Squelched

Justice Young of the Court of Special Term, State of New York, granted a permanent injunction on May 26 against the Mount Vernon Sightseeing Bus Company and Harry Pollowitz on application of the Westchester Electric Railroad, a subsidiary of the Third Avenue Railway system, New York, and of the New York Central Railroad, coplaintiff. The defendants had obtained a permit from the city of Mount Vernon, but had failed to apply for a state certificate of necessity and convenience on the allegation that they were operating a sightseeing service. General Superintendent Thompson and Assistant General Superintendent Wheeler testified as to the traffic carried by trolley cars to the subway terminus near the Mount Vernon-New York City line, while Walter Jackson, consulting engineer, testified for the Westchester Electric Railroad that the bus service took trade from both the railroads and the trolley company. Justice Young's decision confirms the temporary injunction granted in April by Justice Taylor.

Eureka to Vote on Bus

A bond election will be held in Eureka, Cal., on June 14 to vote approval of a $100,000 bond issue to place eight buses on the streets instead of the electric railway cars. If it carries, street car tracks will be torn up. If it fails, then a proposition will be put up to the people to vote for a $270,000 bond issue to rehabilitate the Eureka Street Railway.

Railway and Bus Company Compromise

Approval was given by the Public Utilities Commission to a municipal permit allowing Arthur J. Seldney to operate a bus between Morristown and Morris Plains. The route, about 5 miles long, parallels the tracks of the Morris County Traction Company in Park Place and Morris Street, Morristown. The fare will be 7 cents one way. School children will be carried at 7 cents for two rides. Mr. Seldney agreed to discontinue his bus line between Morristown and Rockaway in competition with the Morris County Traction Company.

Mr. Seldney and officers of the railway will meet with the board's traffic inspector and go over the proposed new route to make restrictions preventing competition. It was agreed by Mr. Seldney not to pick up or discharge passengers in Hanover Avenue within 300 ft. of Speedwell Avenue, and that conspicuous signs be placed indicating the bus stops.

As receivers for the Morris County Traction Company, Joseph P. Tumulty and Joseph K. Choate were granted permission by the board to suspend railway service between Springfield Center and the Central Railroad station in Elizabeth, and to substitute two emergency buses.

Compromise in Manitowoc

Compromising with the Wisconsin Public Service Corporation on a new and revised bus fare schedule of three tickets for 25 cents, seven for 50 cents and a 10-cent cash fare, the City Council of Manitowoc, Wis., by a vote of twelve to two accepted the corporation's proposal to discontinue the present unprofitable railway service in favor of bus service. This change in city transportation facilities will be provided in the form of a four months experiment and will commence about June 1.

Should the riding public express dissatisfaction with the bus service, the traction company has promised to return to the use of street cars. In view of the city's consent the proposal will now go to the Railroad Commission for its approval or rejection. The various steps in the proposed change have been referred to in the ELECTRIC RAILWAY JOURNAL from time to time.

New Line Planned.—The Lehigh Valley Transit Company, Allentown, Pa., has applied to the Public Service Commission for permission to discontinue service between Lansdale and Chestnut Hill. At the same time its subsidiary, the Lehigh Valley Transportation Company, has applied to substitute a bus service on the same route. H. F. Dicke, vice-president of both companies, said that for some years the Lehigh Valley Transit Company has been operating the Chestnut Hill service at a loss. He said that improvements were being made by the Commissioners of Montgomery County which, in the event of the railway service not being abandoned, would involve the company in an immediate expenditure of $37,000 and an additional sum in the next ten years of $238,400.

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Bus to Replace Railway in Hornell.—The Hornell Traction Company, Hornell, N. Y., after 33 years of operation, has announced that it will suspend its city and Hornell-Canisteo lines Aug. 1. An application for a bus line to replace the railway service has been submitted to the Council by Raymond E. Page, receiver for the traction company. It owns and operates about 15 miles of local lines in addition to the 5-mile interurban route between Hornell and Canisteo. The present carhouse will be used as a garage and repair shop for the buses. Local trolley fares, now fixed at 8 cents, would be raised to 10 cents on the buses and the 16-cent fare from Hornell to Canisteo would be raised to 20 cents. It is proposed, however, to sell three bus tickets for 25 cents.

Bus Service in Keene Being Planned.—The Keene Electric Railway, Keene, N. H., is planning to establish bus service in various sections of Keene. The company, operating 10 miles of line, was recently granted authority by the Public Service Commission to use buses on city lines.

Will Operate in Mississippi Towns.—The City Bus Company has been organized as a subsidiary of the Mississippi Power Company for the purpose of taking over and operating the bus line now in service between Pass Christian, Biloxi, Gulfport and other Harrison County coast points. Application has been filed with the Mississippi Railroad Commission for a certificate of authority to begin operations. This is required by an act passed at the last session of the Legislature placing all bus lines under the supervision of the Railroad Commission. The City Bus Company, it is understood, will extend its service to Bay St. Louis, Ocean Springs and several other points as soon as bridges are completed across the Bay of St. Louis and Biloxi Bay.

Beautiful Trips Planned.—The International Railway, Buffalo, in co-operation with the Philadelphia Rapid Transit Company, and Mitten Management, Inc., of Philadelphia plans to start de luxe bus service between Buffalo and Philadelphia this summer. Two days will be required to make the trip over the scenic highways between Buffalo and Philadelphia. Only through passengers will be carried because no local franchises have been obtained from the cities and towns through which the buses will operate. Interstate bus service does not require local franchises.

Railway Buys Bus Franchise.—A franchise for operating bus routes on the west side, south of Main Street, Binghamton, N. Y., was sold on May 10 to the Binghamton Railway after three adjournments. The price was $450. Franchise for the route must also be obtained from the State Public Service Commission. The maximum fare allowed by the city is 7 cents.

Independent Passes to Traction Interests.—The Indiana Public Service Commission recently approved the sale by the Mid-West Transit Company of its permit to operate a line between Indianapolis and West Lafayette to the Indiana Motor Transit Company, a subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company. This line passes through Lafayette, Lebanon, Stanton, Royalton, Traders Point and Flackville. The Motor Transit Company already owns the original Hiner line between these two terminals and plans to abandon operations under one of the certificates. The commission authorized Charles Allen & Sons to discontinue operation of a bus route between Monon and Lafayette on the ground that the line is not a paying proposition.

Bloomington Gets Buses.—Six new Mack buses were placed in service on a new cross-town line in Bloomington, Ill., recently by the Illinois Power & Light Corporation. The buses are being operated on a 7½-minute headway. They will serve a section of the city heretofore not conveniently accessible to street car lines. Railway service on one route which is paralleled by the bus line will be discontinued. The same fare prevails on both street cars and buses. Transfers are being issued at regular transfer points.

New Bus Route Authorized.—The City Council of Lackawanna, N. Y., has granted a franchise to the Hamburg Railway, Hamburg, N. Y., to operate buses from the Buffalo city line at Abbott Road through Lackawanna and Blasdell to Woodlawn Beach, a lake shore summer resort. The fare will be 10 cents for adults and half fare for children under twelve years of age. Buses will be operated on a 40-minute schedule. Single-deck buses will be purchased for this new route.

Bus Permits Rescinded.—The Common Council of Syracuse, N. Y., has rescinded permits granted to a number of bus line operators prior to Jan. 1, 1925. This is the result of long litigation. The permits invalidated include that of T. C. Cherry and the Mid-State Coach Corporation. This company, a subsidiary of the Empire State Railroad, has filed a petition with the Public Service Commission for permission to establish a line to Oswego.

Bus Line Extended.—The Berkshire Street Railway was recently granted a license by the city of Pittsfield, Mass., to operate a bus line through that city to the Lennox boundary. The granting of this license was the last link needed to provide the bus service planned by the street railway from Pittsfield to Great Barrington. The towns south of Pittsfield granted the company the necessary licenses some time ago.

Bus Operation Looks Hopeful.—Bus operation on the Syracuse & Eastern Bus Lines, Inc., a subsidiary of the Syracuse & Eastern Railroad, Syracuse, N. Y., is beginning to show an increase, and company officials are predicting that the company may break even this year, compared with the deficit of $1,511 for 1925. The net income for the first three months of 1926 on the bus lines was $892. Cash fares were 139,675, an increase of 63,091 compared with the first three months of 1925.

Another Extension of Bus Permits.—The Massachusetts State Commission of Public Utilities has announced that the temporary permits granted for the operation of buses will be extended to June 30. These permits were originally expected to terminate on Dec. 31, 1925, and were extended to May 31.

Buses in Danville.—Buses will be introduced in Danville, Ill., soon by the Illinois Traction, Inc. Michael Connor, superintendent, announced that a fifteen-minute service will be established over the first route and other lines which would be established as quickly as possible. Authority to use buses was recently granted by the Illinois Commerce Commission.

Council Disapproves Voters' Views on Lines.—The Buffalo, N. Y., City Council failed to approve a proposed referendum which would allow registered voters to express their views on franchises authorizing the International Railway to start two new bus lines and scrap several existing car lines in the city. Petitions for a referendum now have more than 15,000 signatures. Under the city charter a referendum is allowed on all franchises if a sufficient number of voters demand the right to express their views on the grants at the polls. In view of the attitude of the City Council, it was agreed to hold up the bus permits until the return to Buffalo next month of Mayor Frank X. Schwab, who is touring Europe. It is doubtful if the bus service will be started this year because no referendum could be held until November unless the expense of a special election is decided upon.

Will Serve Western Section.—The Rochester Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways, will start bus service on a new line on the west side, to be known as the Glide Street route, following a grant by the Council. The new line will serve as a feeder to the Emerson Street car line, in accordance with the general policy of the New York State Railways to co-ordinate bus and railway service. The new route will serve a populous residential and factory district on the extreme western limits of the city.

Radial Service Discontinued.—The Canadian National Electric Railways has withdrawn its Weston-Woodbridge radial service on the Western Road, Toronto. Five buses, each seating from 20 to 22 passengers, are now handling the traffic. Although only one car was operated, the radial service ran at a loss all through the winter, it was learned, and the authorities apparently determined that a continuance of the service during the summer meant even heavier losses. The radial fare from Weston to Woodbridge was 16 cents, compared to 25 cents on the buses.

Bus Service in Jacksonville, Ill.—The Illinois Power & Light Corporation suspended railway service between the city square and Nichols Park in the city of Jacksonville, Ill., when it placed in operation on May 7 two new Graham Brothers buses with a capacity of 21 passengers each. For the time being, bus passengers will be carried at the prevailing car fare of 7 cents, although the company states it will probably be compelled to ask a 10-cent fare.

Opposes Bus System.—The Knoxville Power & Light Company of Knoxville, Tenn., has indicated that it will oppose the franchise bid sought by a bus transportation system for operation over certain streets in the city of Knoxville. The railway has stated that its "investment in Knoxville would be impaired by the proposed competition."

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Financial and Corporate

Judge Stone to Confirm Sale of Kansas City Railways

Judge Kimbrough Stone has decided to overrule objections to the foreclosure sale of the property of the Kansas City Railways, Kansas City, Mo., voiced by the second mortgage bondholders and the stockholders of the railway.

Judge Stone's intention to enter an order confirming the sale of the railway to Powell C. Groner has been communicated to R. J. Higgins, who, as attorney for the trustees under the first mortgage, had filed a motion asking for the confirmation.

Powell C. Groner, whose nominal bid of $8,000,000 is to be confirmed, made that bid for the first mortgage bondholders.

The reorganization committee, with Newman, Saunders & Company as reorganization managers, have a corporate vehicle ready in the Kansas City Public Service Company, with William G. Woodfolk as president. In the interval of the transfer the property will remain in charge of Francis M. Wilson and Fred W. Fleming, receivers.

It is said that the fact that Blatchford Downing, attorney for the second mortgage bondholders, has indicated he will carry the case to the court of appeals probably will not interfere with the physical transfer of the property and the termination of the receivership.

Mr. Downing and also Frank P. Sebree, attorney for stockholders, have objected to confirmation of the sale mainly on two grounds, the basis of settlement with the damage suit creditors and the alleged insufficiency of Mr. Groner's bid.

New York Central Advances Money to Traction Lines

In the report of the board of directors to the stockholders of the New York Central Railroad, New York, N. Y., for the year ended Dec. 31, 1925, the company states that there was advanced to the New York & Harlem Railroad in connection with the operation of its traction lines in New York City the sum of $205,000, making the total advances for this purpose to Dec. 31, 1925, $1,312,000. There was advanced to the New York State Railways on its demand notes $1,475,000 and to the Schenectady Railway, also on demand notes, $233,150.

Terms of Distribution of Ohio Traction Assets Decided

Directors of the Ohio Traction Company, Cincinnati, Ohio, have accepted the offer of committees representing preferred and common stockholders to purchase outright the assets of the Ohio Traction Company, Cincinnati Traction Company and Cincinnati Car Company for $5,950,000. This offer is to be submitted to the stockholders at a meeting on June 22. The proposed plan includes organization of a new corporation whose stock will be distributed to Ohio Traction stockholders at a rate of 2½ shares of new stock for each share of preferred deposited, and one share of new stock for three shares of old common deposited. The matter was referred to at length in the ELECTRIC RAILWAY JOURNAL for May 8, page 822.

Automobiles Continue to Affect Income of Washington Company

For the year ended Dec. 31, 1925, the net income of the Capital Traction Company, Washington, D. C., was about $50,000 less than the amount required for the 7 per cent dividend. Operating expenses increased slightly, due entirely to the great increase in the bus service furnished, rail operations costing less than in 1924. Increased competition of privately owned automobiles and of buses continued to cause a decrease in street car traffic, with a corresponding falling off in revenue. The report of George E. Hamilton, then president of the company, to the stockholders, says that it is encouraging to note that the loss in passengers carried for the year 1925 compared with the preceding year was less than 2 per cent, a smaller loss than that of any year since 1919, and also that the last few months of the year showed an actual gain in passengers carried.

Two additional bus lines were established and one purchased during 1925. Capital expenditures for the year amounted to $228,575, the larger part of which consisted of betterments in connection with renewal of track and the purchase of additional buses. Six parlor car coaches were purchased to be used on the Chevy Chase Coach Line and two smaller street car type vehicles for the feeder line near Chevy Chase Circle. No additional street cars were purchased.

Depreciation reserve increased from $2,075,155 to $2,458,455.

The report referred to the suggestion of the North American Company looking toward a merger of the street railway companies. Mr. Hamilton states that a satisfactory base of consolidation or merger has not yet been determined, but an earnest effort is being made by the parties to these negotiations to work out a plan of merger useful and protective to the security holders and to the public.

SUMMARY OF OPERATIONS OF THE CAPITAL TRACTION COMPANY FOR YEAR ENDED DEC. 31

		1925	1924
Passenger revenue, railway		$4,482,040	$4,542,767
Bus revenue		81,877	50,383
Special car revenue		60	131
Special bus revenue		95	.....
Total revenue from transportation		$4,564,073	$4,593,282
Revenue from operations other than transportation		22,982	21,055
Railway operating revenue		$4,587,055	$4,614,337
Operating expenses (67.31 per cent of gross revenue)		3,110,085	3,073,810
Net operating revenue		$1,476,969	$1,540,527
Taxes assignable to railway operation		386,243	392,821
Operating income		$1,090,725	$1,148,104
Non-operating income		33,132	32,421
Gross income		$1,123,858	$1,180,495
Deductions from gross income:			
Interest on funded debt	$280,300		
Interest on unfunded debt	39,056		
Rent for leased road	11,721		
Income tax paid at source	4,314		
Total deductions		$335,392	$324,713
Net income		$788,465	$855,782
Profit and loss statement:			
Credits:			
Balance at beginning of year	$1,528,483		
Net income for year	788,465		
Refunds, electric light bills prior years	1,296		
		$2,318,246	
Debits:			
Dividends		840,000	
Credit balance at close of year		$1,478,246	$1,528,483

REVENUE AND TRANSFER PASSENGERS CARRIED BY THE CAPITAL TRACTION COMPANY

Railway passengers:	1925	1924
Number of passengers carried at 8 cents	16,995,347	16,427,541
Number of passengers carried at 6½ cents	45,066,128	46,846,110
Number of passengers carried at 5 cents	833,352	791,476
Number of passengers carried at 3 cents	345,131	338,017
Number of cash passengers carried on Kensington line	119,757	119,317
Number of ticket passengers carried on Kensington line	52,547	58,092
Total railway revenue passengers	63,412,262	64,580,553
Bus passengers:		
Number of passengers carried at 25 cents	71,466	.....
Number of passengers carried at 10 cents	1,160	.....
Number of passengers carried at 8 cents	252,588	196,068
Number of passengers carried at 6½ cents	466,617	374,078
Number of passengers carried at 5 cents	640	.....
Total bus revenue passengers	792,471	570,146
Total revenue passengers, railway and bus	64,204,733	65,150,699
Other passengers:		
1-cent intercompany transfer passengers	2,759,208	2,794,895
2-cent bus to car transfer passengers	344,011	275,692
2-cent car to bus transfer passengers	310,712	240,160
2-cent Eastern High School ticket passengers	4	1,378
Free transfer passengers	17,111,342	17,105,848
Other free passengers:		
Employees	727,894	792,131
Policemen and firemen*	56,714	64,190
Total passengers	85,514,618	86,424,993

* Exclusive of policemen and firemen riding free while in uniform.

New Owners Take Over Laconia Property

The Laconia Street Railway, Laconia, N. H., was acquired recently by Guy M. Tetley and Howard W. Byse, Laconia. The sale was made from the receivership of Judge Frank M. Beckford. The reorganization of the company's affairs is already under way. New officers have been elected as follows: President, Guy M. Tetley; vice-president, Howard W. Byse; secretary, Thomas F. Cheney.

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Plans include the purchase of new equipment and a rearrangement of the schedules. The Laconia Street Railway is 8 miles long. It was organized in the early '80s, when horse cars were the vogue. Subsequently, the road was electrified, but a year ago the trolleys were succeeded by buses.

Alton Property Sale Set for June 16

Louis Clements, Danville, Ill., attorney, has been appointed a special master in chancery by the U. S. District Court in East St. Louis with authority to sell the properties of the Alton, Granite & St. Louis Traction Company, the Alton Gas & Electric Company, controlled by the East St. Louis & Suburban Company. The Illinois State Trust Company, trustee, is plaintiff in the action in federal court to foreclose on the $2,500,000 mortgage on the properties. The last-named corporation is a Delaware concern, the two others are under Illinois charter. The sale of the properties is ordered for June 16 at Edwardsville, Ill.

California Road Reports $94,727 Available for Surplus

Central California Traction Company, operating in Sacramento, Stockton and Lodi, reports to the California Railroad Commission its 1925 operating revenue at $592,036, compared with $592,798 for 1924.

The operating expenses, excluding taxes, for 1925 are reported at $483,069 and at $507,744 for 1924, leaving net operating revenue of $108,966 for 1925 and $85,053 for 1924. During 1925 taxes charged to operation amounted to $31,195 and for 1924 to $31,911. Deducting the taxes leaves operating income of $77,771 for 1925 and $53,142 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of $94,727 for 1925 and $73,969 for 1924.

Claims Against United Railways, St. Louis, for Services Disallowed

Special Master Fred L. Williams in reports filed with the United States District Court recommended that claims of A. L. Shapleigh, Richard McCulloch and Judge Henry S. Priest, totaling $125,175, against the United Railways, St. Louis, Mo., for services alleged to have been rendered be denied.

Messrs. Shapleigh and McCulloch had asked $30,937 and $24,487 respectively for acting as president of the United Railways since the receivership, while Judge Priest asked $69,750 salary as general counsel for the company.

Their claims were not resisted by Receiver Wells at the recent hearing before Special Master Williams. In his report denying the claims and recommending that this action be approved by the court Mr. Williams held that the proof offered at the hearing in support of the claims was not sufficiently definite for him to determine the reasonable value of the services which it was set up had been rendered.

Conspectus of Indexes for May, 1926

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	May 1926 **7.36**	April 1926 **7.36**	May 1925 **7.27**	March 1926 **7.36**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	May 1926 **153.1**	April 1926 **154.2**	May 1925 **153.9**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	May 1926 **225.4**	April 1926 **224.7**	May 1925 **222.2**	Sept. 1920 **232.0**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	May 1926 **202.4**	April 1926 **201.3**	May 1925 **202.0**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	May 1926 **207.3**	April 1926 **207.0**	May 1925 **207.2**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	April 1926 **151.1**	March 1926 **151.5**	April 1925 **156.2**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	May 1 1926 **12.86**	April 1 1926 **13.11**	May 1 1925 **13.32**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	April 1926 **162.4**	March 1926 **159.9**	April 1925 **150.8**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	April 1926 **168.4**	March 1926 **168.5**	April 1925 **164.8**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Apr. 30 1926 **3.868**	Mar. 31 1926 **4.380**	Apr. 30 1925 **4.447**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	April 1926 **18.65**	March 1926 **19.50**	April 1925 **17.82**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number	April 1926 **1743**	March 1926 **1882**	April 1925 **1667**	Jan. 1924 **2231**	Aug. 1925 **1353**
Liabilities (Millions)	**47.34**	**46.93**	**50.60**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. Previously the wage index applied to 144 railways. The change is due to dropping some roads where the number of trainmen has been reduced to a total of less than 100.

$313,006 to Philadelphia Surplus

P. R. T. Took in $49,911,703 in 1925—Lost $228,989 on Buses—Many Interesting Facts in Statement

Passenger revenue of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for 1925, including buses, was $49,911,703. Operating expenses and taxes were $37,533,858. After providing for payments to city sinking fund, rental for Frankford elevated, fixed charges, the semi-annual dividend on preferred stock and 8 per cent dividends on common stock, $313,006 remained to be transferred to surplus.

Net income for 1925 of $3,006,727 is from the operation of subway-elevated and surface lines. From this must be deducted the loss of $233,211 resulting from the operation of buses and trackless trolley, making a net income for the entire system of $2,773,516.

During the fifteen years 1911-1925 under Mitten Management P. R. T. earned a surplus of $19,866,381. Of this $13,687,464 has been paid in P. R. T. dividends and $6,178,916 put back into the property.

P. R. T. bus system has, during 1925, been extended through the installation of nine new routes operating over 150 miles of city streets. A deficit of 228,989 resulted from 1925 operation through giving service in districts where it is needed, but which will be unprofitable for years to come. As the management sees it, this deficit does not take into consideration the much larger loss due to duplication of service through diversion of traffic from surface cars. Supplying this needed but unprofitable service by street cars would have resulted in a much greater loss.

Throughout the year 1925 P. R. T has been engaged in the presentation of facts and legal argument before the Public Service Commission demonstrating its right to continue the temporary 7½-cent token-8-cent cash fare. The Public Service Commission, in its decision handed down on Jan. 12, 1926, gave this rate of fare final approval. The P. R. T. present 7½-cent fare embodies a combined surface-elevated-subway ride.

P. R. T. has continued to work toward a transit system which contemplates co-ordinating and unifying every phase of Philadelphia's public passenger transportation. To this end the operation of street car lines, city-built high-speed lines and buses has been consolidated. As a necessary step toward further co-ordination, P. R. T. proposes to operate taxicabs and to this end has arranged, subject to the approval of the Public Service Commission, for the purchase of the Yellow Taxicab Company for $3,000,000.

Following the stockholders' approval at the 1925 annual meeting, P. R. T. presented to the city the easterly half of the P. R. T.-owned tract of ground known as Burd Home so that it might be used as an extension of Cobbs Creek Park. The cost of this acreage is continued as part of P. R. T. valuation, but the city secures ownership now, instead of waiting until the close of the city-company agreement in 1957.

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Since 1912 the $10,000,000 issue of P. R. T. 5 per cent bonds had been conditionally sold or pledged at a net cost of about 7 per cent; $8,975,000 of these bonds have now been permanently sold, with interest at 6 per cent.

Early in 1925 P. R. T. offered to its customers $3,000,000—60,000 shares—of its 7 per cent cumulative preferred stock and in six days 14,000 car riders subscribed to 71,428 shares. The subscriptions were received on the cars with weekly payments thereafter made to P. R. T. trainmen.

It is explained that $10,000,000 of 7 per cent cumulative P. R. T. preferred stock has just been oversubscribed by P. R. T. car riders, in lots not exceeding 20 shares, without brokerage charges or commissions, during a sales offering upon the cars of ten days duration. More than 40,000 car riders will hold this stock.

Proceeds from this issue will be used toward payments for normal capital expenditures for improvements and extensions, for retiring underlying securities, the cost of South Philadelphia track extensions to serve the Sesqui-Centennial, purchase and rehabilitation of the Frankford, Tacony & Holmesburg Railway and to reimburse the P. R. T. treasury for reserves heretofore used to finance improvements.

Wages of employees during 1925 were based on a rate of 77 cents an hour. The basic wage for 1926 will by agreement be 73½ cents an hour in payment for average services as rendered elsewhere, and will be continued except as it may be adjusted to conform to the purchasing power of the dollar, as set forth in the plan for collective consideration, hereto appended. This change is not made for the purpose of reducing wages, but so that the last 3½ cents an hour of the wage, approximating $1,000,000 a year, shall, in so far as possible, be made dependent upon the continued efficiencies and economies of the men, to which end it is included as a part of the management's fee.

The report, dated March 1, is concluded with a discussion of the Mitten plan for 1926, in which it is said in part:

> The distinctive feature of this plan as compared to others, and the one to which its greatest success is attributed, is that men and management must agree, otherwise arbitration follows. Whereas in other plans, whether the representatives of men and management agree or disagree, their action is subject to final review and approval or veto by the head of the company.
>
> The 1926 plan again reiterates the principle that nothing shall interfere with the right of any employee to become a member of any union or organization, without let or hindrance.
>
> Working conditions are dealt with by the branch committees, from whose decisions appeal may be taken to departmental and general committees. All books of rules for the direction of employees are submitted to and receive the approval of the departmental committees before being put into effect. No change may be made in such books of rules without the approval of the departmental committees.
>
> Discipline is administered by the management and its representatives in accordance with the rules and as their best judgment dictates, but appeal from any disciplinary act of management may be taken to the branch, departmental and general committees respectively.
>
> Wages are to be determined for each class of employees upon the basis of a fixed rate established by the general committees; change in the wage base thereafter to be in accordance only with the rise or fall in the purchasing power of the dollar. Such changes are to be in relation to the changes in the composite cost of various standard market baskets, as determined upon by the general committees.
>
> Adjustment of wages to the changing purchasing power of the dollar assures protection of the present standards of living. The co-operative wage as here described assures an increasingly higher standard of living, on the one hand, through the added return to employees by their proportionate share of increasing gross earnings, and, on the other, through the investment of this added income in the industry, by the increasing dividends on their growing investment.
>
> P. R. T. employees have been receiving since 1922 a co-operative wage equaling 10 per cent of the payroll, which has been by mutual consent invested in P. R. T. stock—$10,000,000 par value, 200,000 shares—by trustees of the men, to such good effect that the present average rate of return on the money invested is almost 13 per cent per annum, which sum is paid directly to the men, according to their holdings, by the men's own trustees immediately after the payment by P. R. T. of its quarterly dividends. One-third of P. R. T. common stokc is now owned by the men, who vote this stock, through their own trustees,
>
> Beginning with the year 1926, Mitten Management will receive a management fee of 4 per cent of the gross revenue of the system, payable cumulatively after earning the regular dividend to P. R. T. stockholders. In recognition of co-operative effort, this management fee is to be divided equally between men and management, each co-operating regular employee to be credited at the end of the year with his proportionate share.

COMPARATIVE INCOME ACCOUNTS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

Year	Gross Earnings	Maintenance and Renewals	Power-Opr. Conducting Transp. & General	Taxes	Fixed Charges	Net Income
1911	$22,147,974	$3,661,198	$8,627,973	$1,591,253	$8,827,988	$560,708*
1912	23,282,408	3,492,361	9,097,061	1,659,518	8,961,126	72,342
1913	24,240,592	3,636,088	9,081,213	1,660,236	9,324,559	538,496
1914	23,961,398	3,594,209	8,825,665	1,808,951	9,531,232	201,341
1915	24,315,455	3,647,318	8,677,465	1,783,540	9,622,631	584,501
1916	27,279,517	4,091,928	9,382,541	1,812,587	9,614,908	2,377,553
1917	29,726,927	4,459,039	10,723,912	2,106,769	9,573,522	2,863,685
1918	31,704,427	4,755,664	13,355,575	2,428,819	9,629,553	1,534,86
1919	36,039,520	4,955,124	17,287,117	2,345,750	9,735,652	1,715,877
1920	39,400,341	5,965,409	20,628,504	2,601,253	9,823,110	382,065
1921	42,911,040	8,560,400	19,874,369	2,798,821	9,870,158	1,807,292
1922	43,235,972	8,560,400	20,407,117	2,586,001	9,853,177	1,82,277
1923	45,552,031	8,560,400	22,479,553	2,695,708	10,016,370	1,800,000
1924	46,215,488	8,560,400	22,678,896	2,760,903	10,404,924	1,819,365
1925	50,361,568	8,560,400	25,053,203	3,030,824	10,710,414	3,006,727

*Deficit

INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT COMPANY FOR YEAR ENDED DEC. 31

	1925	1924
Gross passenger earnings	$48,827,951	$45,002,700
Other operating revenue	715,818	652,317
Railway operating revenue	49,543,769	45,655,017
Way and structures, equipment and power—maintenance, renewals and depreciation	8,560,400	8,560,400
Power operation	3,738,715	3,772,643
Conducting transportation	15,898,894	14,313,232
General	5,415,593	4,593,019
Taxes, including paving tax	3,030,824	2,760,903
	36,644,427	34,000,199
Operating income	12,899,342	11,654,817
Non-operating income	817,798	560,470
	13,717,141	12,215,288
Interest	1,399,370	1,371,252
Rentals	8,662,924	8,541,591
Frankford elevated rental	468,119	312,079
Sinking fund—City contract	180,000	180,000
	10,710,413	10,404,924
Net income	$3,006,727	$1,810,364

CONSOLIDATED INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT SYSTEM FOR YEAR ENDED DEC. 31, 1925

Gross passenger earnings	$49,911,702
Other operating revenue	691,883
	$50,603,586
Way and structures, equipment and power—Maintenance, renewals and depreciation	8,760,903
Power operation	3,738,720
Conducting transportation	16,612,472
General	5,350,881
Taxes, including paving tax	3,070,879
	$37,533,888
Operating income	$13,069,727
Non-operating income	416,857
	$13,486,585
Frankford rental and sinking fund to purchase P. R. T.	648,119
	$12,838,465
Fixed charges, dividends, etc.	12,525,459
Surplus	$313,006

INCOME ACCOUNT OF THE PHILADELPHIA RURAL TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Passenger revenue	$1,005,338
Other revenue	26,362
	1,031,700
Operating expenses and taxes	1,135,360
Operating income	*103,659*
Non-operating income	9,443
	94,216
Fixed charges, etc.	134,773
Deficit	*$228,989*
Passengers carried	10,817,628
Average rate per passenger, cents	9.29

STREET CAR AND SUBWAY-ELEVATED PASSENGER STATISTICS

	Passengers Carried 1925	Passengers Carried 1924	Average Rate per Passenger, Cents 1925	Average Rate per Passenger, Cents 1924	Passenger Revenue 1925	Passenger Revenue 1924
January	76,626,563	78,297,258	5.41	4.79	$4,148,090.48	$3,748,595.68
February	70,811,587	73,247,920	5.38	4.78	3,807,920.36	3,501,989.71
March	78,940,472	79,591,970	5.36	4.78	4,234,351.70	3,802,197.01
April	77,999,649	78,235,652	5.36	4.78	4,178,685.85	3,743,361.49
May	79,579,698	81,288,979	5.33	4.77	4,240,538.85	3,880,553.43
June	74,693,804	75,366,347	5.31	4.77	3,969,166.03	3,591,596.89
July	71,601,642	71,989,422	5.29	4.77	3,790,398.32	3,430,594.88
August	70,439,444	68,650,403	5.28	4.76	3,721,880.02	3,266,126.70
September	72,747,702	71,260,433	5.31	4.90	3,863,437.61	3,490,695.31
October	81,209,381	77,796,303	5.33	5.40	4,325,415.53	4,203,772.70
November	77,846,788	74,087,646	5.33	5.41	4,151,101.32	4,010,418.26
December	81,740,396	79,491,612	5.35	5.42	4,396,965.40	4,332,798.20
Total	914,237,126	909,303,945	5.34	4.95	$48,827,951.46	$45,002,700.26

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Receiver Authorized to Pay July 1 Interest.—Federal Judge Faris has authorized Rolla Wells, receiver for the United Railways, St. Louis, Mo., to pay the July 1 interest coupons on the $36,300,000 of 4½ per cent bonds of the company. The interest amounts to $726,000.

Line Abandoned.—The Denver Tramway, Denver, Col., has abandoned its Englewood-Cherrelyn line in favor of buses because of the inability of the company to make the line pay. Back in 1883 horse cars were run on this line. In 1910 the route was electrified. Reference to this plan was made in the JOURNAL for May 15, page 860.

Discontinuance Petition Opposed.—Residents of Blue Island, Harvey and other Chicago suburban towns appeared before the Illinois Commerce Commission in Chicago recently to oppose the petition of the Chicago & Interurban Traction Company to discontinue operation of cars between 63d Street, Chicago, and Kankakee. They stated that there is need for the service in various communities among the approximately 50 miles of route. The line is paralleled for the entire distance by a concrete highway and several steam railroads. Service has been conducted at a loss for a number of years. The hearing was continued.

$1,000,000 City Railway Notes Are Refunded.—Action of officials in refunding $1,000,000 three-year notes of the Louisville Railway, Louisville, Ky., which fall due on June 1, 1926, has been approved by the Board of Works. A new issue of 6 per cent notes running for two years from June 1 will take the place of the refunded notes.

Seeks to Abandon Three Miles.—The Utah Rapid Transit Company, operating in Ogden, Utah, has applied to the Public Utilities Commission for permission to abandon 2.94 miles of its electric railway system between North Ogden and Pleasant View. In the same petition the company sets forth that it may later find it necessary to ask permission to abandon the other section of the North Ogden line from the north city limits to North Ogden. Steadily decreasing revenues are given as the reason for the request.

Slight Decrease in Surplus.—For the period from Jan. 1 to March 31, 1926, the Lake Shore Electric Railway, Cleveland, Ohio, had gross earnings of $780,997, against $776,608 for a similar period in 1925. The operating expenses and taxes increased from $636,417 for the 1925 period to $648,688 in the 1926 period. The surplus showed a decrease. It was $28,598 for the period from Jan. 1 to March 31, 1925, and $27,558 for the three months period of the current year.

Bonds for Betterments.—The Indiana Public Service Commission has authorized the Evansville & Ohio Valley Railway, Evansville, Ind., to issue $16,000 in first mortgage 6 per cent gold bonds at 87½ per cent of par to pay for additions and betterments. According to G. R. Millican, general manager of the company, the bond issue covers an accumulation of small items on improvements, some of which were made during the past year.

Personal Items

New Honor for E. H. Maggard

E. H. Maggard, president of the Petaluma & Santa Rosa Railroad, Petaluma, Cal., was elected president of the California Electric Railway Association at its eleventh annual meeting on May 17. The new head of the association has been in the employ of the Petaluma property since 1907, when he entered the service as general freight and passenger agent. He continued in that capacity until promoted to the office of general manager in 1916, succeeding in that position the late Elmer M. Van Frank. Prior to his association with the California property and at an early age he entered the service of the Missouri, Kansas & Texas Railway at Dennison, Tex., as call boy. Later he was made clerk in the freight office of the Southern Pacific at Houston. He next became identified with the El Paso & Northeastern Railway at El Paso and from that property went to Petaluma.

Changes in Scranton

Lawrence H. Stone has been transferred from the New York office of the General Engineering & Management Corporation to Scranton, Pa., as auditor of the Scranton Railway. The general auditing formerly was done in New York.

C. O. Brooks, formerly connected with the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., the Third Avenue Railway, New York City, and the Youngstown Municipal Railway, Youngstown, Ohio, has been appointed superintendent of equipment in place of J. F. Duffy, who resigned on May 1. Mr. Brooks' offices are located at the carhouse of the company at Providence Road.

E. L. Austin Heads Sesqui-Centennial

A. C. Baker, director-in-chief of the Sesqui-Centennial celebration in Philadelphia, Pa., has been retired as head of the Sesqui-Centennial and has been relieved of all executive duties because of illness. He will be succeeded by E. L. Austin, business manager and comptroller of the exposition. The career of Mr. Austin, formerly with the Philadelphia Rapid Transit Company, was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 1, 1925, page 185.

Promotions at Racine

Emil Jorgenson, who has been connected with the Wisconsin Gas & Electric Company for the past eighteen years, has been promoted to the post of assistant secretary and assistant treasurer, with offices at Racine, Wis. For several years past he has been auditor.

John I. Allen, assistant auditor, who joined the company's forces at Kenosha in 1912 as timekeeper and reached his present post of assistant auditor three years ago, has been promoted to auditor to succeed Mr. Jorgenson.

Alfred H. Marsh has been appointed supervisor of the recently formed accident prevention bureau of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. Mr. Marsh has been connected with the Brooklyn system more than 34 years. He has had experience as conductor, inspector, dispatcher and depot master in the surface transportation department, and later as investigator and adjuster in the claim department. He also served as special investigator, managing clerk and special adjuster in the law department. In his new work Mr. Marsh will conduct all investigations, tabulate all accidents and make studies of the conditions and hazards pertaining to the various lines.

Leslie Wipperman, who has been manager of the Wisconsin Rapids Street Railway, Wisconsin Rapids, Wis., for many years, has resigned from that post. He has no definite plans for the future. John Shanks, who has been connected with the company's properties at Negoosa, has been selected to succeed Mr. Wipperman.

George T. McIntosh has been appointed statistician for the Winnipeg Electric Company, Winnipeg, Canada.

C. A. Wait, assistant to the president of the Illinois Power & Light Company, Chicago, Ill., has taken over the additional duties of director of public relations of the Illinois Traction System.

R. C. Slye, who has been chief clerk at the Milwaukee, Wis., office of the Chicago, North Shore & Milwaukee Railroad for many years, has been promoted to the post of city passenger agent, giving the Milwaukee office two city passenger agents. C. G. Miles, Fort Wayne, has been appointed Mr. Slye's successor.

T. Justin Moore, general counsel of the Virginia Electric & Power Company, Richmond, Va., was appointed vice-president at a recent meeting of the board of directors. He succeeds E. Randolph Williams.

Obituary

Henry Fleetwood Albright, vice-president in charge of manufacturing and a director of the Western Electric Company, died on May 11. His outstanding contribution was in scientific factory planning and management. He began his business career as an office boy with the Union Pacific Railroad in Philadelphia.

Augustus Barnes, assistant to the president of the People's Motorbus Company, St. Louis, Mo., and the man who obtained the original bus permits for that company, died at the Jefferson Hotel in that city on April 25. He had been ill about ten days. When the Hertz interests entered the St. Louis bus field and the People's Motorbus Company was finally organized Mr. Barnes was named assistant to the president in charge of publicity and public relations.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

G. E. Will Exhibit at Atlantic City Convention of A. R. A.

At the convention of the Mechanical and Purchases and Stores Divisions of the American Railway Association, to be held at Atlantic City, June 9-16, the General Electric Company will occupy booths 5, 60, 62, 64, 66, 68, 70, 72, 74 and 76. Its exhibits will include electric and oil-electric locomotives, gas-electric cars, a complete line of car shop control equipment, motors, arc welding equipment, flow meter equipment, Fabroil and Textolite gears, floodlighting projectors, fuse cords and phono-electric cells.

Coal Bill Will Be Reported

Assurances have been given the President by Chairman Parker of the House committee on interstate and foreign commerce that a coal bill will be reported by his committee and will be pressed for passage at this session of Congress. The President has been advised further that a majority of the committee has come to an understanding as to the principle of the bill which will be recommended, although the details of the bill have not been worked out as yet.

It was stated at the White House that this information is very gratifying to the President and that he thinks Congress should enact legislation at this session along the lines that have been indicated.

Abuse of Time Selling Plan in Bus Field Is Dangerous

Expressing doubt as to the advisability of selling commercial motor vehicles on the time-payment plan with insufficient down payment and ensuing payments spread out too long, the *Wall Street Journal* for Saturday, May 8, pointed out that the problem of disposing of repossessed buses and trucks is becoming an increasingly important one with the manufacturers. Bankers are sounding a note of warning against the practice mentioned above, which condition has been brought about by the extremely keen competition which has arisen in the commercial motor vehicle field, this having resulted in the extension of unusually liberal terms to prospective purchases by many of the leading manufacturers. The *Wall Street Journal* states that the report is current in the trade that at least one important manufacturer has on hand nearly $1,000,000 worth of repossessed vehicles, on which the purchasers have failed to continue their payments, and the smaller concerns are in a relatively similar position.

The *Journal* goes on to state:

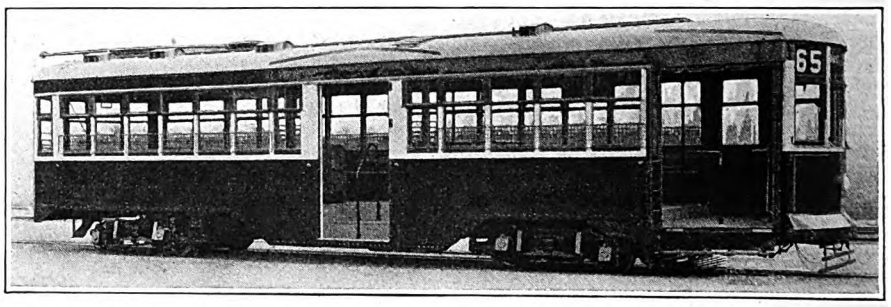
When the practice of time selling of trucks and buses was inaugurated, the purchaser was obliged to make an initial payment of at least one-third of the purchase price of the vehicle, plus the cost of insuring it fully. Subsequent payments were spread out over a period of twelve or eighteen months. Recently, however, many truck and bus makers have been financing time sales on a basis which obligates the purchaser to a substantially smaller amount with respect to his initial payment, and subsequent monthly payments are being permitted to run over a period of two years.

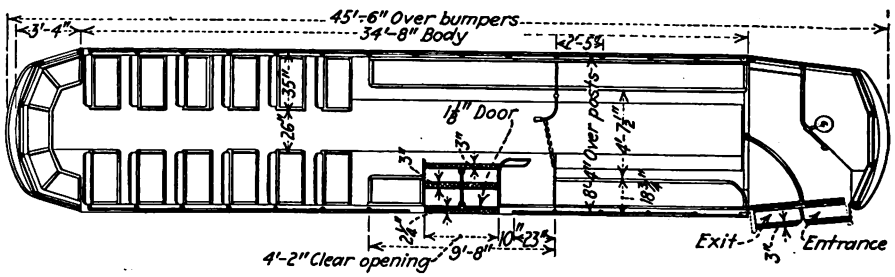
With competition keener than ever before in the history of the commercial vehicle industry, these repossessed machines are becoming an increasingly important problem with the manufacturers. In some instances the vehicles have been depreciated in value below the amount which has been paid on them, and in others the manufacturer is fortunate if he can turn the unit over again without a loss. This, of course, has an adverse effect upon new vehicle sales.

O. M. Edwards Furnishes Sash for Montreal Cars

It was stated in the issue of ELECTRIC RAILWAY JOURNAL for May 8, page 830, that sash fixtures on the 50 new cars being built by the Canadian Car & Foundry Company for the Montreal Tramways would be provided by the National Lock Washer Company. This statement is hereby corrected to read that the cars are entirely equipped with brass sash and fittings furnished by the O. M. Edwards Company. These cars and the sixteen cars for the British Columbia Electric Railway are said to be the first in Canada completely equipped with brash sash.

Fifty New Cars Will Aid with Sesqui Crowds





Delivery of 50 new streets cars recently ordered from the J. G. Brill Company by the Philadelphia Rapid Traction Company is expected to be made prior to June 1, according to an announcement by the car builders. The cars are of single-end construction and are destined to be placed in service to aid with the augmented traffic expected in Philadelphia during the Sesqui-Centennial Exposition. Specifications on the new units follow:

Weight:	
Car body	18,295 lb.
Trucks:	
Front	5,490 lb.
Rear	5,475 lb.
Equipment:	
Electric	6,100 lb.
Air brake	1,500 lb.
Total	36,940 lb.
Bolster centers, length	24 ft. 6 in.
Length over all	45 ft. 6 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 0⅜ in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Carbon Steel
Bumpers	Channel type
Car signal system	Consolidated and Faraday
Car trimmings	Brill
Center and side bearings	Brill
Compressors	GE CP-27-A
Conduits and junction boxes	Brill galvanized iron junction boxes and Crouse-Hinds and Erie Malleable Iron Works condulets. Rigid iron conduits
Control	GE type K-68-A
Couplers	Pull socket and portable bar
Curtain fixtures	Curtain Supply Co. on 27 cars; National Lock Washer on 23 cars
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	National Pneumatic
Energy-saving device	Economy meter
Fenders	H-B lifeguard
Gears and pinions	Tool Steel
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Electric Service Supplies
Journal bearings	Plain
Journal boxes	Brill
Lightning arresters	GE type MD-3
Motors	GE-275-B, outside hung
Paint	Lucas
Registers	International
Sanders	Ohio Brass
Sash fixtures	Brill
Seats	Brill
Seating material	Wood slat
Springs	Brill
Step treads	Universal
Trolley catchers	Ohio Brass
Trolley bas	US-14
Trolley wheels	P.R.T. standard
Trucks	Brill 39-E-2
Ventilators	Garland C-1 Junior
Wheels	Rolled steel 28 in. and 22 in.
Special devices, etc.	"Promet" journal bearings.

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Changes in North East Service, Inc., Personnel

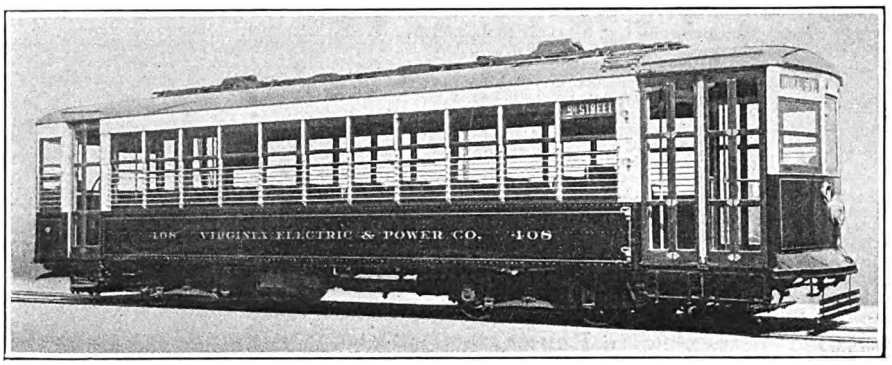
Warren K. Lee, manager of the North East branch at Detroit, has been appointed sales manager of North East Service, Inc., with headquarters at Rochester, N. Y. Mr. Lee joined the North East organization at Rochester in 1915. In 1916 he served with the American troops at the Mexican border as a member of the cavalry contingent of the New York State Militia. Upon his return he was appointed assistant manager of the Chicago branch, where he remained until the United States entered the war in 1917. Mr. Lee then joined the Engineering Corps with a lieutenant's commission and saw active duty in France. At the close of the war he was appointed manager of the Detroit branch, filling the vacancy left by R. J. Kelleher, who was at that time placed in charge of North East activities in Europe.

D. P. Cartwright has been appointed service manager of North East Service, Inc., with headquarters at Rochester, N. Y. Mr. Cartwright came into the North East organization in 1918 as manager of the New York branch. He continued in that capacity until 1925, when he was delegated to make a special trip around the world for the purpose of extending the activities of the North East Service organization in the Orient. For a number of years Mr. Cartwright was a director of the Automotive Service Association of New York. He was made a life member of the association at the time of his departure upon his trip.

W. C. Edwards, assistant manager of the North East branch at Chicago, has been appointed manager of the Detroit branch to succeed Warren K. Lee, who has just taken up his duties as sales manager of North East Service, Inc., at Rochester.

Trainload of Trolley Cars for Richmond, Va.

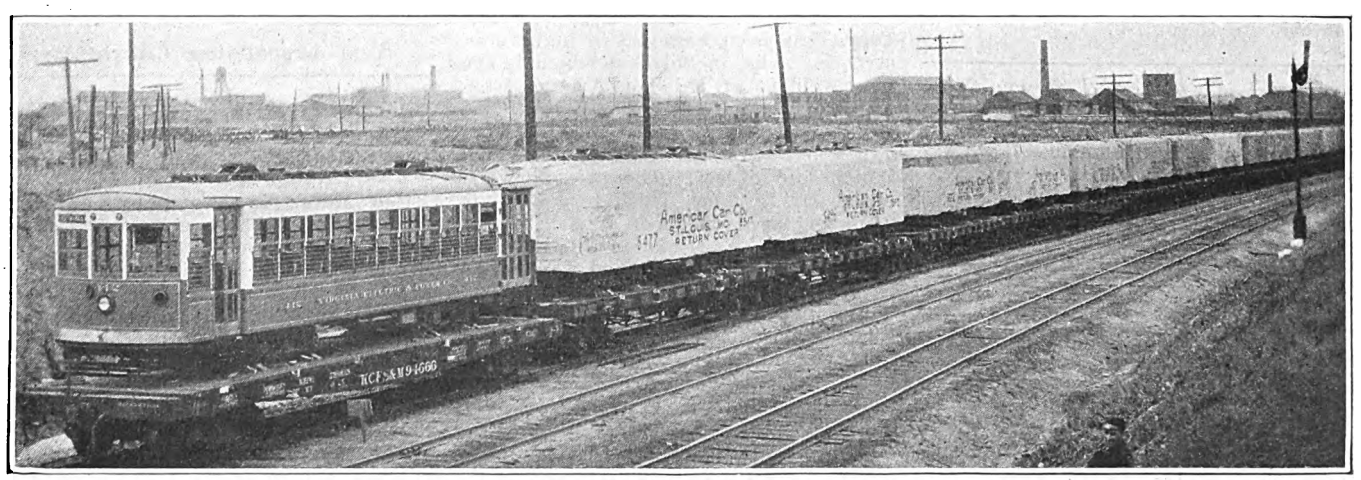
Seldom are the natives along the right-of-way of one of the country's railroads treated to the spectacle of a whole trainload of street cars being shipped hundreds of miles to their destination. Yet this sight was provided recently when the American Car Company of St. Louis, Mo., shipped a trainload of fifteen double-truck, double-end safety cars to the Virginia Railway & Power Company, Richmond, Va. Events such as this cannot have other than a most salutory influence upon public opinion, for they provide a very wholesome object lesson on the progressive spirit which is being increasingly shown within the industry. Upon arrival at Richmond the train occasioned much interest among the citizenry. The cars are now in service.



Exterior View and Floor Plan of the Richmond Cars

Specifications on the cars, which are of all-steel construction and capable of seating 44 passengers, are appended here:

Bolster centers, length	17 ft. 10 in.
Length over all	40 ft. 1 in.
Truck wheelbase	5 ft. 1½ in.
Width over all	8 ft. 5 in.
Height, rail to trolley base	11 ft. 0 in.
Body	All steel
Interior trim	Light colored mahogany
Headlining	Haskelite veneer ceiling
Roof	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Channel iron
Car signal system	Faraday
Car trimmings	Statuary bronze
Center and side bearings	Brill
Compressors	DH-16
Control	K-35
Curtain fixtures	National Lock Washer
Curtain material	Double-faced Pantasote
Destination signs	Hunter illuminated
Door-operating mechanism	American Car Co.
Enamel	Pratt & Lambert Vitralite
Energy-saving device	Economy meters
Fare boxes	Johnson
Fenders	H-B lifeguard
Gears and pinions	Westinghouse
Hand brakes	Peacock staffless
Heaters	Consolidated double-coil truss plank
Headlights	Ohio Brass type ZP
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors	Westinghouse No. 508 inside hung
Sanders	American Car Co.
Sash fixtures	Schechter post casings, etc.
Seats	Brill Waylo
Seating material	"Friezette" plush
Springs	Brill
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	Ohio Brass
Trucks	Brill No. 177-E-1 friction bearing
Ventilators	Railway Utility double honeycomb
Wheels	Standard Rolled Steel Co. 26-in. diameter
Special devices, etc.	Root air-operated track scrapers



Fifteen Cars Being Delivered to Virginia Railway & Power Company

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Customer	Number	Model
Public Service Transportation Co., Newark, N. J.	54	Gas-electric chassis
Tulsa Street Railway, Tulsa, Okla.	3	X, 21-passenger city service
Indianapolis Street Railway, Indianapolis, Ind	3	Z, 29-passenger city service
United Electric Railways, Providence, R. I.	10	Z, 29-passenger city service
Wisconsin Power & Light Company, Fond du Lac, Wis	1	Y, Parlor coach
	2	Z, 29-passenger city service
Nashville, Chattanooga & St. Louis Motor Transit Co., Nashville, Tenn.	3	Z, 29-passenger city service
Fifth Avenue Coach Company, New York, N. Y	5	Y, Parlor coach
Key System Transit Co., Oakland, Cal	3	X, 21 passenger city service
Joliet Transportation Co., Joliet, Ill	1	Z, 29-passenger city service
Montreal Tramways, Montreal, Quebec, Canada	5	Z, 29-passenger city service
East St. Louis & Suburban Railway, East St. Louis, Ill	4	Z, 29-passenger city service
Illinois Power & Light Corporation, Quincy, Ill	2	X, 21-passenger city service
Illinois Power & Light Corporation, Galesburg, Ill	2	X, 21-passenger city service
City Railway, Los Angeles, Cal	1	Z, 29-passenger city service
Illinois Power & Light Corporation, Peoria, Ill	2	X, 21-passenger city service

101 Yellows Sold to Railways in April

For the month of April, the Yellow Truck & Coach Manufacturing Company reports deliveries of bus equipment to railway and traction companies as shown in the above table.

North Shore Cars Being Rushed

After a trial run, during which they attained a speed of 75 m.p.h., eight new all-steel passenger motor cars recently received by the Chicago, North Shore & Milwaukee Railroad at Highwood, Ill., from the Cincinnati Car Company have been pronounced satisfactory in every particular and are ready for service on the new Skokie Valley division, which will be opened about June 1.

The new equipment is part of an order placed last fall for twenty passenger cars and two dining cars. Delivery has been speeded up in order to have the additional equipment in service by June 24, when more than a million delegates to the International Eucharistic Congress are expected to entrain for Mundelein, Ill. The motors are being installed in the company's shops at Highwood as fast as the cars are received.

Rolling Stock

Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has received one six-cylinder type observation parlor car from the Fageol Motors Company of California.

Nashville Railway & Light Company, Nashville, Tenn., has just received one Differential car from the Differential Steel Car Company of Findlay, Ohio. This car is equipped with GE-275 motors and K control.

Metal, Coal and Material Prices

Metals—New York	May 25, 1926
Copper, electrolytic, cents per lb	13.80
Copper base, cents per lb	16.00
Lead, cents per lb	7.65
Zinc, cents per lb	7.20
Tin, Straits, cents per lb	61.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.425
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.20
White lead in oil (100-lb. keg), N. Y., cents per lb	15.00
Terpentine (bbl. lots), N. Y., per gal	$0.86

Victorian Railways, Melbourne, Australia, has received one six-cylinder parlor car chassis from the Fageol Motors Company of California.

Track and Line

Philadelphia, Pa.—One bid was received by the City Transit Department on May 21 for the contract for supplying the rails for the Broad Street subway and the contract was at once awarded. The single proposal was from the Bethlehem Steel Company, Bethlehem, Pa., and its offers for the 2,884 tons of rails, 205,000 spikes, nutlocks and bolts is $172,541. The third section of the rail equipment contract for the Broad Street subway is covered in a call to be issued for bids for the special trackwork in the Fern Rock terminal. The bids will be opened by Director of City Transit Ehlers on June 26. The advertised call for proposals enumerates rails, frogs, switches, crossings, tie-plates and all appurtenant equipment for the terminal. Call for the special trackwork, such as switches, crossovers, sidings and frogs for the main line is being advertised now, and these bids are to be opened on June 16. Contract for finishing the stations will soon be let.

Nashville Railway & Light Company, Nashville, Tenn., has been petitioned to extend its Buena Vista line across the Hydes Ferry bridge to Jordonia. The railway is willing to make the extension provided it is assured patronage sufficient to offset the expenditure.

Birmingham Electric Company, Birmingham, Ala., has been granted a franchise for a single-track car line on Twenty-first Street. The track will be utilized in rerouting East Lake cars.

Memphis Street Railway, Memphis, Tenn., has been engaged in many construction jobs, included in which is the improvement of Madison Avenue from Third Street to Marshall Avenue. The street is being widened to 49 ft. between curbs from Third Street to Lauderdale Street. The present wood block paving from Third to Fourth is being replaced by sheet asphalt. New 7-in. A.E.R.E.A. standard rail is being laid between Third and Piomingo Streets. The company recently completed overhauling the tracks on Thomas Street from the Union Railway crossing to the end of the line. Early in the present year the company began rebuilding the tracks on Fifth Street and on Sixth Street. New 7-in. A.E.R.E.A. creosoted ties and steel base plates are being installed. It is estimated that the work will take about two months to complete.

Power Houses, Shops and Buildings

Virginia Electric & Power Company, Richmond, Va., has started work on the construction of a modern bus terminal repair shop at the corner of Davis and Grayland Avenues. The new bus terminal, when completed, will represent an investment of approximately $20,000. It will be used as headquarters for the fleet of buses operated by the company in Richmond. Plans for the shop were designed by Allen J. Saville, Inc. This firm will also undertake the construction of a concrete building which will be 50 ft. x 140 ft. in dimension, a size adequate to handle the company's buses. The bus terminal will be used also as a repair shop and will be thoroughly equipped with machinery for undertaking all classes of repairs.

Trade Notes

H. B. Sauer has been appointed manager of the Detroit branch of Timken Roller Bearing Service & Sales Company. He was formerly assistant branch manager at Cleveland.

Samuel D. Hibben has been placed in charge of the combined engineering and illuminating department of the Westinghouse Lamp Company. Under his supervision will be grouped the commercial engineering department and the illuminating bureau, the consolidated activities to be known as a new commercial engineering department. His headquarters will be removed from 150 Broadway, New York, N. Y., to the company's plant at Bloomfield, N. J.

P. F. Rose, formerly assistant branch manager of the Timken Roller Bearing Service & Sales Company, has been appointed branch manager of its Cincinnati office.

Edward J. Doggins has joined the sales staff of the Eisemann Magneto Corporation, New York, N. Y. For the past four years he has acted as credit manager of the company and now covers the Southeastern territory. Stephen M. Cargill, Jr., succeeds Mr. Doggins as credit manager. Mr. Cargill was a former credit investigator for R. G. Dun's Commercial Agency.

New Advertising Literature

Sangamo Electric Company, Springfield, Ill., has issued a booklet giving instructions for the use of Sangamo D5 watt-hour meters.

Reo Motor Car Company, Lansing, Mich., has published a booklet which contains the editorials on bus operation which have appeared in back numbers of *Reo Bus News*. The foreword states that the book was prepared in response to many inquiries for these editorials, coming from various universities as well as engineering concerns. A number of editorials by Carl Parker are included giving pertinent suggestions as to the proper co-ordination of bus and railway service. Copies of this attractively edited booklet may be obtained from the Reo company.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

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JUN 7 1926

Interpreting Courtesy in Dollars and Cents

UNSATISFACTORY relations between utility management and its customers has been cited as sufficient reason for refusing an increase in rates. This unusual stand was recently taken in a decision of the California commission, which stated that the attitude of representatives of the company during the hearing was such as to lend color to the charges made by customers concerning the character of the business dealings of the applicant with them. "The evidence shows," the decision read, "that at the time of the hearing there were many prospective customers who were not using gas and that certain customers had ceased using gas because of unsatisfactory personal relations with the utility."

The order further pointed out that a sincere effort on the part of the owners to give satisfactory service and courteous treatment to customers would undoubtedly result in an increase in business and a thoroughly satisfactory return. Before renewing its application the company would be required to make a more satisfactory showing of improved public relations.

So evident is the moral of this unfortunate experience that it requires little comment. It is but another illustration of the saying that courtesy pays and discourtesy is likely to bring its own penalty.

Mr. Cobb Is Demonstrating His Faith

MANY expressions of faith in the electric railway industry have been made by men high in its councils. Words of encouragement from important executives help to stimulate operating officials and their staffs to greater effort in meeting the daily operating problems, particularly on properties where the immediate margin between income and expense is lean and doubtful. Conditions in the industry, viewed in perspective, show a most encouraging trend, but it requires the continued assurance of those who see things as a whole to revive the spirits of the men immersed in the routine of an individual property.

It is, however, far more reassuring when expressions of confidence in the essential soundness of local transportation as an industry are backed with the courage to send good money after bad to provide the physical equipment and facilities with which to offer needed improvements in service. Consequently, the words of B. C. Cobb, vice-president Hodenpyl, Hardy & Company, Inc., and chairman of the Electric Railway Advisory Council, in a recent talk before the Rotary and Allied Clubs in Akron, Ohio, are particularly timely. "I have not," said Mr. Cobb, "lost faith in the electric railway business, for I am certain the people cannot do without electric railway service."

Similar statements have been made by others. In many cases the speakers have likewise occupied positions of authority and responsibility which give their words the weight of mature judgment. But in the light of the policy followed on the properties whose destinies he guides, Mr. Cobb's statement commands additional attention. In this same light, his expression of faith is tempered with keen business foresight. Mr. Cobb not only expressed his confidence in the electric railway industry, he is demonstrating it!

He is demonstrating it in Akron, the rubber city, and his demonstration has just given unreasonable labor leaders the most serious setback they have experienced in years. In Grand Rapids street railway history is being made. In Chattanooga, Nashville and Evansville new cars are destined to put the railways in an entirely different position before the eyes of the public. He has made of the bus an ally instead of a competitor, and it proved a very valuable ally indeed in the recent strike in Akron. Mr. Cobb has not done all these things. But he has made them possible. He is helping to build confidence and determination in the mind of every progressive executive in the industry.

Ancient Jurist Throws Light on Franchises and Certain Permits

IT SEEMS a far cry from the times of George III to the present, but Blackstone's definition of a franchise was quoted in a decision by the Nebraska Supreme Court in March, with others, to determine whether a permit to operate buses between fixed termini in Omaha was or was not a "franchise." The modern use of the word "franchise" in connection with the operations of public utilities may have given some people the idea that it is of recent derivation. Actually, its use goes back to the Middle Ages, when it implied a royal privilege in the hands of a subject. Blackstone's definition, written about 1765 and slightly condensed, is as follows:

"A franchise is a thing of interest and assignable and transferable. But a license is only a privilege to a certain person to do an act with impunity. When the King grants a market, he creates and grants a real thing; but when he gives liberty to trade, he does not create or grant a real thing, but only discharges or prevents a penalty inflictable for trading without leave."

The application of this principle in Omaha occurred because the city authorized the operation of certain bus lines without requiring this action to be approved by popular vote, as the law requires in the case of a "franchise." But in the ordinance, as passed, the city reserved the right to modify the provisions of such permit or to revoke it entirely, without redress or damages by the common carrier affected.

In its decision upholding the right of the city to grant these permits against the protest of the railway company, the Nebraska Supreme Court (208 N. W.

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Rep., 123) declared that the ordinance permitting the use of motor buses to operate over certain routes as common carriers within the city "must be construed, not as a grant, but a regulation of a right pre-existing." In defense of this position, the court quoted the definition of a franchise already given, as well as definitions by other authors and by the United States Supreme Court. It then went on to declare that in view of its provisions the ordinance was simply the exercise of a power already existing in the city to regulate the traffic on the streets, even though the permit under which the buses operated as common carriers had many of the characteristics of a regular franchise.

Obviously, the same view may not be taken in other states. Thus, California takes the position that any use of the public highways of the state for commercial purposes is a privilege which can be permitted to some users and withheld from other persons at the pleasure of the Legislature of the state. Under this ruling, the right of the Legislature to define common carriers and specify the use they can make of the highways has been confirmed by the California Supreme Court.

If Louisville Would Achieve Its Ambition

LOUISVILLE hopes to achieve greatness. That is a laudable desire. Nobody will be found to quarrel with the city on that score. But it is trying to achieve that end while at the same time disclosing a disposition to hamstring its street railway. The two do not go together. Cities do not grow despite their street railways. They grow because of them. A starved creature of any kind is a pretty poor recommendation for its keeper. The city that starves its street railway in the sense that it is too parsimonious to permit its railway to grow and expand deserves the stigma that attaches to the emaciation which its railway is sure to reflect in the extent and character of the service that is supplied.

All the Louisville Railway wants is a fare that will permit it to grow. And it is entitled only to that. So far as the company is concerned it can get by on its present rate. But getting by is not the end of things. Nobody worth while subscribes to any such doctrine. And the Louisville Railway is very much worth while—much more worth while to the city than it is to itself, which in the last analysis is the stockholders.

Money for investment has to be attracted into the channel that gives promise of return commensurate with the risks involved. That is elementary, but it is fundamental. It is a truism that Louisville needs to ponder and reflect. That city should consider the recent experiences of Cleveland and Dallas, in both of which constructive amendments to franchise grants have been made after a vain attempt to evade the simple mathematical formula that nothing from nothing leaves nothing.

The old story holds true of the fellow who equipped his horse with green goggles and then fed him on shavings. The horse died. Boosting Louisville industrially will do no good if its street railway reflects emaciation imposed from without. All the railway asks is that the city be just, not generous. The day of inordinate profit in the public utility field—and as a matter of fact even that idea has been greatly overworked—has gone, never to return. This is not something that is debatable. It is a fact. Business men of Louisville appear to sense and appreciate this. It is high time that others also began to see the light. Until they do Louisville may carry on, but it will never achieve the civic, industrial or social heights to which it justly aspires.

Far-Sighted Management Needed to Prevent Unwarranted Destruction

EVEN though the electric railway industry as a whole has turned a corner in its progress there are still many individual properties so hopelessly involved that their continued existence is extremely doubtful. The unfortunate situation is that these backward properties cast unwarranted reflections on the industry at a time when the general public and many more closely identified with the industry find it all too easy to throw up their hands.

There comes to mind a property once taking in $1,000,000 gross annually. It was financed badly and operated by its directors with the ultimate hope of selling at a profit. It had many bond issues. These were allowed to exist without making provision for retirement or for refunding. The management was more interested in finance than in service, and the public relations suffered until the property had little or no standing in the community it served and from which it drew its revenue.

Then the fight for bus supremacy came. The property did not have the help of the community because it had not deserved it in the early days. Even though the management changed hands the old stigma remained. Justly or not, the reputation seems to remain firmly attached to the physical property rather than the personnel or its ideals. Again, the state public service commission was poorly advised by one of its employees, and an independent got a permit to operate competitive bus service through a tragedy of errors. In all too brief a time the buses gained a third of the railway revenue. This was done in the usual manner of taking a great part of the base load away from the railway and leaving the unprofitable surplus peaks for it to handle.

Receivership followed in the early stages of this competition, after which still further losses of riders to the buses took place. This made it impossible to maintain a satisfactory cash position without too great a curtailment of maintenance expenditures. What chance exists for a reorganization plan among interests that have no concern with transportation or service? The bondholders' committees representing the several underlying issues are only concerned with recovering their own money. Some of the smaller issues are the senior securities on certain sections, and unless they can be paid off at par their owners see an opportunity to get out whole through the sale of their portion of the rails and cars for scrap. Transportation means nothing to them; service to the community is of no interest. Nor can they be blamed for this viewpoint. It is just an unfortunate result of a failure to grasp the situation in time. Today, the whole system, once a successful property, may go on the junk pile at 10 to 20 cents on the dollar and the communities served will lose a valuable servant.

The burden of providing with buses all the transportation requirements of the community throws the mantle of responsibility on new and inexperienced shoulders. This is an entirely different situation than

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that of carrying only the cream of the traffic built up through a quarter of a century or more. The outcome will be interesting, but the experiment may prove costly to the community at a time too late to retrace its steps. The newspaper headlines will say "Railway Abandons Service" or "Buses Supersede Obsolete Railway." "Wrecked by Poor Management and Uninformed Public" would more accurately reflect the facts.

Buses Do Their Bit in Akron

IN THE case of an agency so new and undeveloped as is the bus in the transportation field it is dangerous to draw sweeping conclusions from experiences in isolated instances.

Akron now occupies the center of the bus stage again. This time the bus has more than held its own in furnishing an emergency service that went a long way toward breaking the back of the recent street railway strike. Even before the strike, almost an equal number of street cars and buses were in use. During the early stages 210 buses were run for emergency purposes, 58 of which were in interurban service. In addition, 100 trucks were being used by the local railway to handle its freight and express.

Thus it becomes evident that discussion of the physical capacity of buses to handle the transportation requirements of cities of one size or another leads nowhere. In the previous strike, unorganized bus service failed miserably. In the present emergency, better organization and better equipment permitted them to make a much better showing. The first attempt was an effort by an uninformed city administration to prove that buses could furnish transportation service at a 5-cent fare when the railway claimed that adequate public transportation required a higher rate. This second emergency use of the bus was to maintain transportation service on the part of an organized and responsible agency in the face of an unwarranted refusal by its car employees to continue their work.

Many unwise sweeping conclusions as to the physical limitations of bus service were drawn from the previous Akron experience. The proper place of the bus and the car will be settled on economic grounds. The question of physical capacity is and always will be a secondary one. There has been too much loose talk on both sides of the bus-car question and too little sincere effort to determine and develop the field for each vehicle.

Too Much Caution and Not Enough Speed

SO MUCH prominence has been given in the last few years to the "safety first" idea that the perspective of some railway operators has become distorted. The continual preaching of "safety first" sometimes has instilled a spirit of over-cautiousness, which has resulted in too great a reduction in the speed of car operation.

From the humanitarian standpoint, safety can hardly be overdone. No effort is too great to avoid accidents resulting in personal injury. It is not so much from this source, however, that the impetus for safety campaigns on the electric railway has come as it is from the desire to reduce the money cost of accidents. A minor collision may require the payment of damages for a bent mudguard or a broken windshield of somebody's automobile. In the aggregate, these payments often amount to a sizable sum, even for a railway of medium size. Claim departments have made tremendous, and frequently very successful, efforts to cut down expenditures of this sort.

In the accomplishment of this end, however, another element of primary importance may have been lost to sight. The public demands speed. If electric railway service is slow, people will seek other means of transportation—safe or otherwise. Loss of revenue from this source easily may amount to more than the saving made by the claim department.

To get away from the tendency to sacrifice speed to cautiousness, it is not necessary to operate the car along the streets like a juggernaut. This was not done before the advent of the automobile and the consequent safety campaigns, nor need it be done now. A car can be operated speedily while under reasonable control. The motorist should exercise his share of caution, too, not leaving it to the railway to do all the thinking about safety. By this means, the transportation service will be improved and the accident hazard will be reduced rather than increased.

Who Is to Blame for Failure of Effective City Planning?

CONCERNING comprehensive plans for civic improvements, particularly those involving transportation facilities, it might be aptly said that many are made but few are carried out. Why is this so? Usually, it is in part the impracticability of the proposed plans that prevents their execution and in part the difficulty of overcoming the inertia of things as they are.

Often the theorists and the realists fail to get together because neither group realizes the importance of the other. The civic planners have a tendency to consider the practical transportation men as "lowbrows," and the latter reciprocate by regarding the planners as impractical "highbrows."

It is all very well to make idealistic plans for future transportation facilities, but first they must be built and then they must be operated. That means that they must be feasible from the construction standpoint and reasonably promising from the financial standpoint. Ideas of the experienced local transportation men usually will be found invaluable in mapping out a sound, practical program. Those charged with the preparation of plans for the future make a serious mistake by not availing themselves to the full of this fund of useful information.

On the other hand, it must be admitted that many transportation men fail adequately to appreciate the value of what the planners are doing. They are skeptical about so much theoretical discussion. Such an attitude is a mistake, too. While the plans may be imperfect, they are, nevertheless, an attempt to regulate development in the right way rather than allowing it to proceed haphazard. Much of our existing congestion could have been avoided by careful planning years ago. Planning now for the future is absolutely necessary if our next state is not to be worse than our present.

For best results, therefore, the theorists and the realists must work together. The latter will temper the plans with common sense and the former will instill a touch of idealism which should eventually result in greater achievement.

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This Latest Division of the Austrian State Railways to Be Electrically Equipped Passes Through a Section of Wonderful Scenery

Austria Extends Electrification

Two Important Lines on Mountain Sections Involve Serious Problems in Insulation and Overhead Line Construction—Single Phase at 15,000 Volts and 16⅔ Cycles Is Used

WHILE Austria as a country is much smaller than it was, it has gone courageously ahead with the electrical equipment of those portions of its State Railways for which the advantages of electrification are especially pronounced. One principal reason for this policy, of course, is the abundance of water power in the mountains of Austria, especially in those portions of the Alps in the southern and western parts of the country toward Switzerland and Italy.

Two of the latest divisions of the Austrian State Railways to be equipped with electric power are the Arlberg line and the Salzkammergut line. Both traverse mountain ranges and have extended tunnel sections. Their locations are shown on the accompanying map. In the following account of these lines information has been combined, received from the railway authorities and from an article in *Electrotechnik und Maschinenbau* by Ing. Hugo Luithlen of the electrical department of the Austrian State Railways.

The Arlberg Line Part of a Through Route

As will be seen, the Arlberg line connects Innsbruck in the Tyrol and all of Austria east of that city with the extreme western part of the country which borders on the upper Rhine Valley and on Lake Constance. Thus this line forms a part of a through route from Vienna to Switzerland and thence via Zurich and Basel to Paris and London. This line was opened with steam as a motive power in 1884, when the 6½-mile tunnel under the Arlberg (a mountain in the Austrian Alps) was completed.

With the improvements made in electric traction, its merits and economy for an installation of this kind became increasingly apparent. Finally contracts for the electrical equipment of the Arlberg line from Innsbruck to Bludenz were awarded. As the electrification was for a section of track already built, the work required to complete the necessary hydro-electric power development took the longest time, but in 1925 the undertaking was finally accomplished. The time-table for the summer season of 1925 provided for a de luxe train via this route, running three times a week, with through cars from Vienna to Paris and Calais, with a running time between Vienna and Paris of 25 hours. In addition there were five passenger trains daily each way over this route, three of them carrying through cars scheduled as far west as Zurich and Paris, with an equal number of trains going east, carrying through cars as far as Vienna, Warsaw and Budapest.

The distance from Innsbruck to Bludenz is 136 km. (85 miles). Measured as single track the division consists of 196.1 km. (123 miles).

Hydro-Electric Power Station

The hydro-electric power station for this section, known as Spullersee Station, is located in the Vorarlberg region at the western end of the line and utilizes a head of about 2,880 ft. from Spuller Lake. The sta-

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tion contains at present three 8,000-hp. units and has a capacity for twice that output. The second station is at Ruetz, south of Innsbruck, and toward the eastern end of the line. It was built for commercial purposes before the electrification of the Arlberg line, but has been extended so as to supply the additional power required, particularly in the summer, by the Arlberg Railway. Its capacity is 8,000 hp. The two stations are connected electrically by a tie line with a voltage of 55,000.

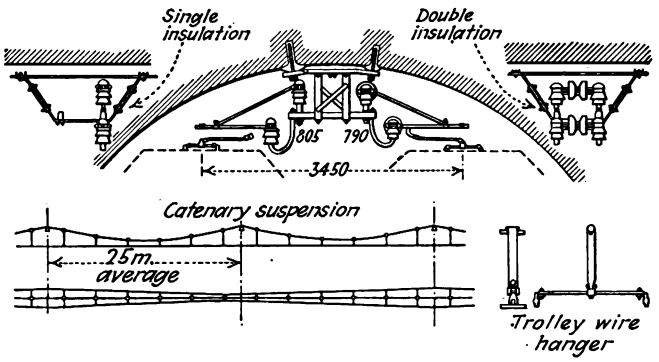


Diagram of Construction in the Tunnel. The Dimensions Are in Millimeters

It is at this voltage that single-phase, 16⅔-cycle energy is distributed to the four substations.

Transmission Lines

Located as these power lines are in the Alps, at altitudes varying between 3,000 and 6,600 ft. above sea level and traversing regions subjected to the most severe winter climate, some unusual methods of construction and maintenance had to be used.

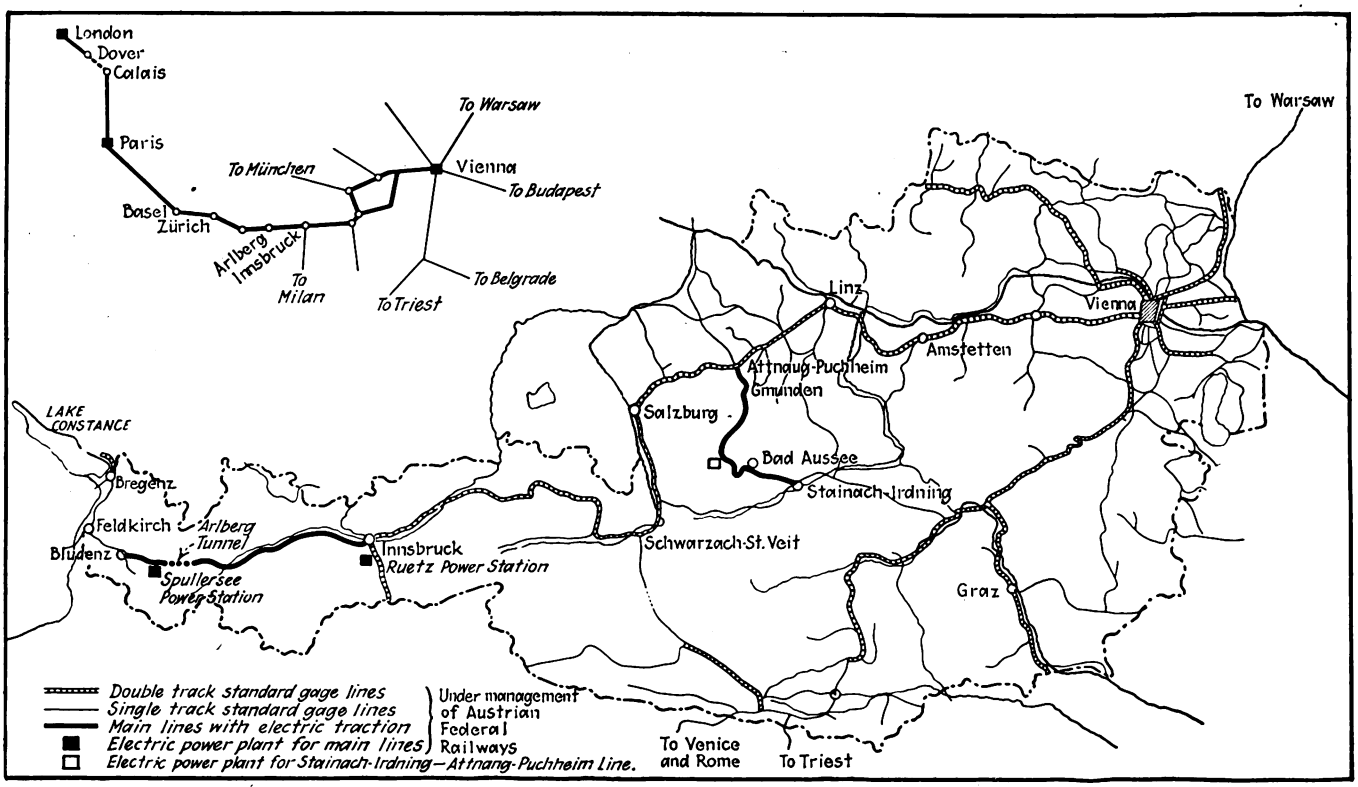
The transmission lines are carried for the most part on steel towers, set in concrete block foundations, but to some extent reinforced concrete poles of double-T cross-section are used. With these latter poles, a special hole was left in the web of the pole at approximately its center of gravity, so that with the aid of a special portable hoist the setting of these poles was much simplified.

The average spacing of the towers on level sections is 500 ft., with the transmission wires 16½ ft. apart, but this spacing of the wires was increased to 26 ft. in the long spans of 800 ft. Suspension insulators of three or four units were installed on the majority of the towers. These insulators, before being installed, were tested with 110,000 volts under oil and 125,000 volts in the air. Mechanically, the type of insulator used has a strength of 7,500 lb. Wherever highways, railways or rivers had to be crossed a double set of insulators was employed for each transmission conductor.

Part of the transmission line is carried at a considerably higher altitude than the railway, because when the tunnel under the Arlberg is reached the transmission line is carried over the mountain rather than through the tunnel. This was done because experience with underground cable construction had not been advanced sufficiently at the time of the construction of this line to warrant the engineers in recommending the use of a cable built for 55,000 volts. In consequence, the transmission line reaches an altitude of 6,600 ft.

Unusually heavy steel towers, most of them on concrete foundation rising to a height of 12 ft. above the ground, were installed on this section of the line. Experienced mountain guides were consulted by the erection engineers, so that the towers would be placed at points where there was a minimum of avalanche danger. The average distance between towers was here reduced to 450 ft., and some of the line sections are so steep that two adjacent towers which are 550 ft. apart have a difference in elevation of 340 ft.

To withstand safely the high winds and heavy sleet to which this line is exposed bronze wire was used with suspension insulators having a mechanical strength of 17,000 lb. The Austrian rules on safe line construction prescribe that a transmission line must withstand



Though Restricted in Territory, Austria Is Carrying Forward Main Line Electrification. Two Important Divisions Recently Electrically Equipped Are Shown on This Map

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a wind pressure of 125 kg. per square meter, but on this installation the possible strain used in the calculations was increased from 125 kg. to 150 kg.

The maintenance of this mountain section of the transmission line has been intrusted to picked crews of linemen, all of whom are expert on skis. They have their headquarters and keep their maintenance supplies in a hospice located near the top of the Arl Mountain.

Over the entire length of the line a stranded steel wire is carried for lightning protection.

Distribution at 15,000 Volts

Each substation is equipped with two single-phase, 55,000/15,000-volt transformers, and it is at the latter voltage that the single-phase energy is put on the overhead lines.

Each of the four transformer stations supplies its own section of overhead line. At the end of each section are circuit breakers, by which one section of overhead line and its parallel feeder may be separated from those of the adjacent section. In addition, the overhead line at each of the 25 passenger stations along the route is so connected that the section at the station may be cut out of circuit in case of local trouble, the continuity of the general line being preserved by a jumper line installed around the passenger station. All of the electrical switches for this sectionalizing at each passenger station are in a special switching tower, which is kept doubly locked. The inner lock is so arranged that its key can be withdrawn only when the switches are opened.

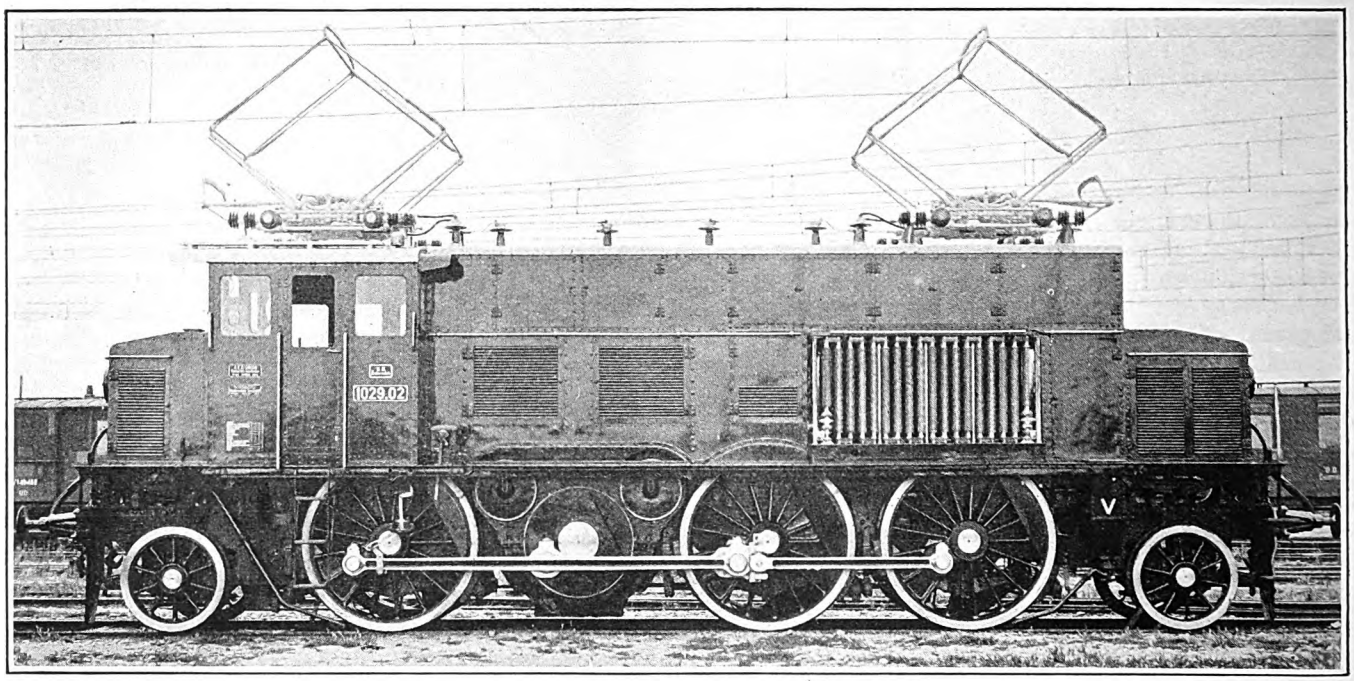
The key for this lock is kept by the station master so that the section of overhead line around a station can be de-energized when necessary only by some authorized person.

The side tracks at all stations are normally dead and must be energized by the engineer of the electric locomotive before he enters them. When the overhead wires at a station are "killed" an automatic interlock closes the semaphore for that section so as to block the entrance of trains into the station.

The supports for the catenary construction are placed at an average distance of 250 ft. apart. Practically all of the poles are of steel, though a few sections of track have wooden or concrete poles. For the entire installation, except in the tunnels, a minimum distance of 10 in. has been established between ground and all parts carrying the trolley voltage of 15,000. This distance has been reduced at certain points in the tunnels to 6 in.

When carried over tangent track the working conductor is zigzagged plus and minus 18 in., so as to distribute wear on the pantograph. The height of the working conductor over the rails in the open averages 20 ft., but in the tunnels this distance is reduced to 16 ft. Whenever a change in the height of the trolley wire is necessary, such as when a tunnel entrance is approached, the change in elevation of the wire is not permitted to exceed one in 300.

Insulation of the entire overhead line construction against ground is double; that is to say, wherever the line is supported there are always two insulators between the wire and ground. Where public highways are crossed and in all switch yards rupture-proof suspension was chosen. Large steel objects on the right-of-way, such as bridges and trestles, are permanently connected by bonds to the rails.



Passenger Train Locomotive on the Arlberg Division

Working Conductor

The trolley wire or working conductor is of figure 8 cross-section. When this section was under consideration, objection was made that such profile is apt to be made soft in the drawing process when made from a round cross-section. This was overcome, however, by rolling the section from rolls made for the purpose. Early in the work a few of the yards were equipped with steel trolley wire instead of copper to save expense, but this plan was abandoned on account of the resulting wear on the locomotive pantographs.

Two methods were followed on different sections of the line for insulating the steel standard catenary cable. On one section of the line use is made for this purpose

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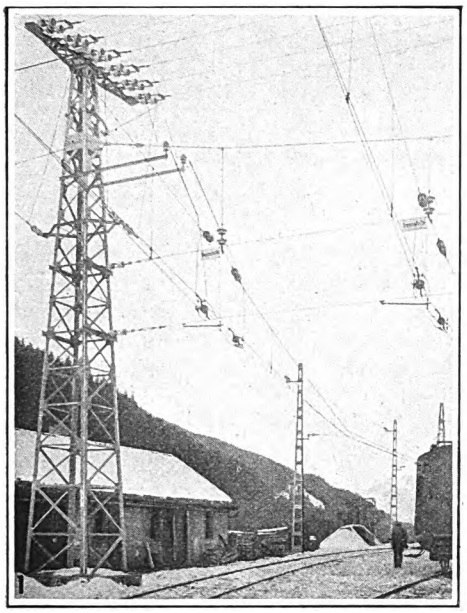
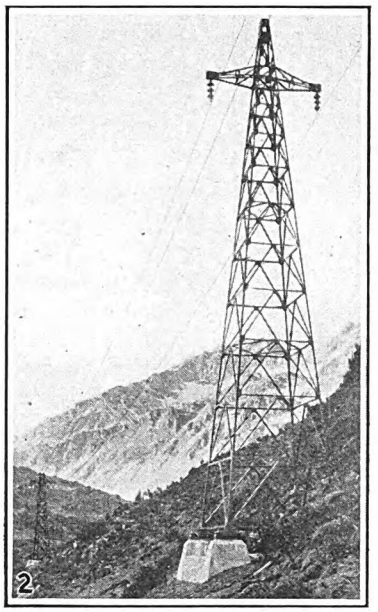
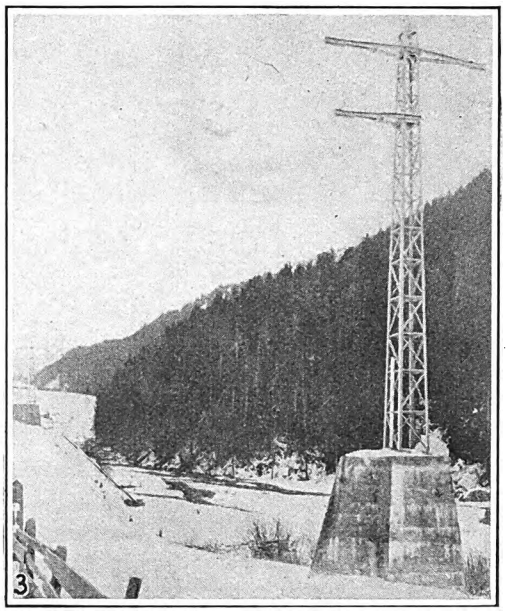


No. 1. A Typical Anchor Tower in a Switch Yard on the Arlberg Line. On This Section the Overhead Line Uses Suspension Insulators



No. 2. The Transmission Line of the Arlberg Division Reaches at Times to Higher Altitudes than the Railway

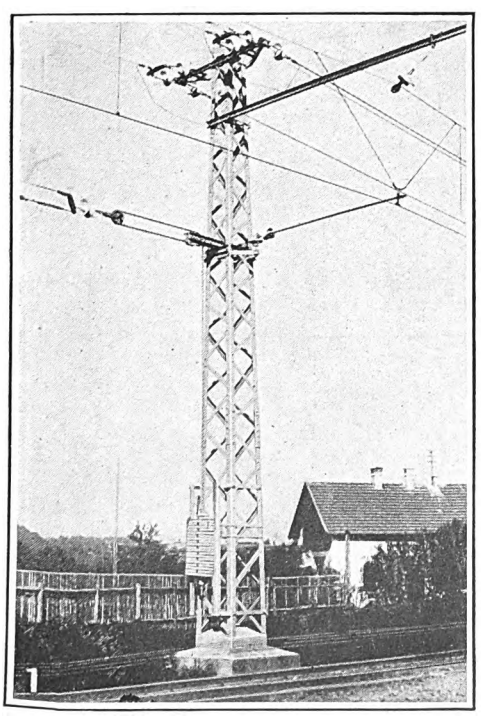


No. 3. The Transmission Towers Are Mounted on High Concrete Bases, at Points Where the Snowfall Is Likely to Be Heavy

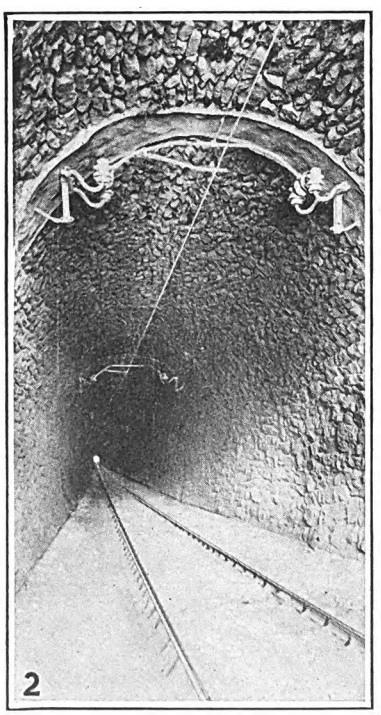
of the suspension type of insulators. The catenary itself, on this portion of the line, consists of a standard cable of 49 zinc-coated steel wires, each 1 mm. in diameter, to which the vertical hangers are fastened at intervals of 16½ ft. These hangers are 4 mm. galvanized steel wires, and galvanized steel bolts and brass nuts are used throughout. In long, level portions of the double-track line the poles carry brackets to which are attached the insulators for the catenary cable and also at times an outrigger bracket arm or pull-off for the purpose of steadying the position of the working conductor.

On the second section of line, insulators of the cup and spool type are used. They were tested to withstand 115,000 and 130,000 volts (under oil and air flashover respectively) and each is made from a single piece of porcelain. On these sections the catenary cable is made up of seven galvanized steel wire strands, each 3 mm. in diameter. The hangers are made of 5 mm. steel and instead of supporting the working conductor directly, their lower ends are attached to an auxiliary catenary or carrier cable of 6.5 mm. solid steel, from which the working conductor is supported. All clamps, bolts and nuts are bronze.

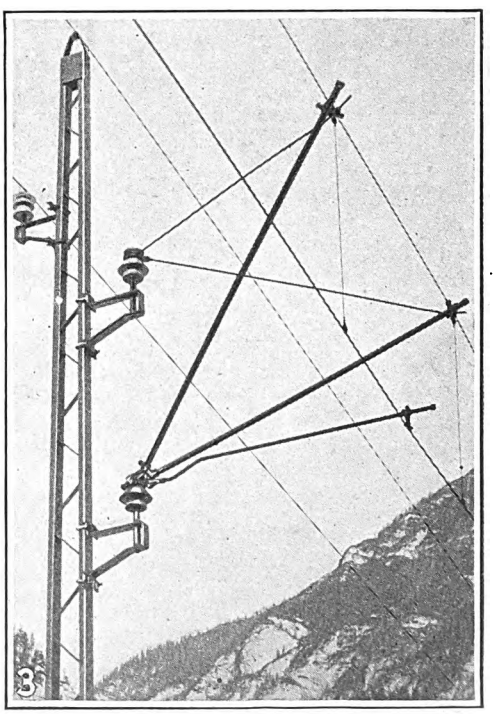
In both of these forms of construction special means are used, except in the tunnels, to maintain a constant



No. 1. A Typical Anchor Tower on the Salzkammergutbahn, Showing Also the System of Counterweight by Which the Trolley Wire Is Kept Taut



No. 2. Type of Construction Used in the Tunnel of the Arlberg Line, Where Precautions Must Be Taken to Guard Against Moisture



No. 3. The Salzkammergutbahn Overhead Construction Is Also of Two Types. The One Shown Elsewhere Illustrates One Type. The Other Is Illustrated Above

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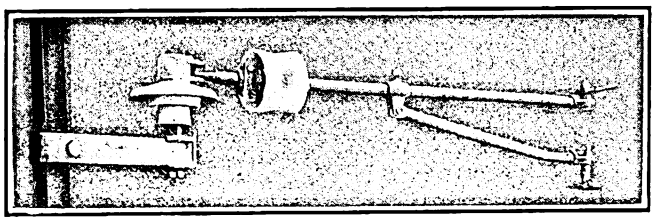


Hinged Bracket or Pull-Off as Used in the Section Equipped with Suspension Insulators

tension on the trolley wire. This is accomplished, as in other European installations, by dividing the working conductor into sections and keeping it taut by counterweights. In the 6½-mile tunnel the temperature is so nearly constant that it was not considered necessary to use any method of keeping the wire taut by counterweights.

Overhead Construction in Tunnel and Bonds

While overhead construction in the tunnel was simplified in the respect just mentioned, in other respects it presented many problems, notably because of the limited room and excessive humidity. Some accompanying views show the method followed of supporting the wire in the tunnel.

Over each track were strung two trolley wires, each 65 sq.mm. in section and 16 ft. above the top of the rail. These conductors were supported on special hinged brackets, as illustrated. The catenary cable is of bronze to prevent rusting. The steel used for the fittings is all-coated by the zinc spray method, and while final results have not yet been obtained, it appears that this method has not come fully up to expectations. Suspension points are every 60 to 90 ft. In the middle of the tunnel the lines can be disconnected by oil switches installed in a suitable chamber.

Various types of rail bonds are being tried. At present tests are being conducted with welded bonds. This problem is not yet considered to be solved in a satisfactory manner.

To aid in the maintenance of the line, one gasoline-electric work car is now available and three more have been ordered.

Three Types of Locomotives Used

Three types of electric locomotives are used on the Arlberg line:

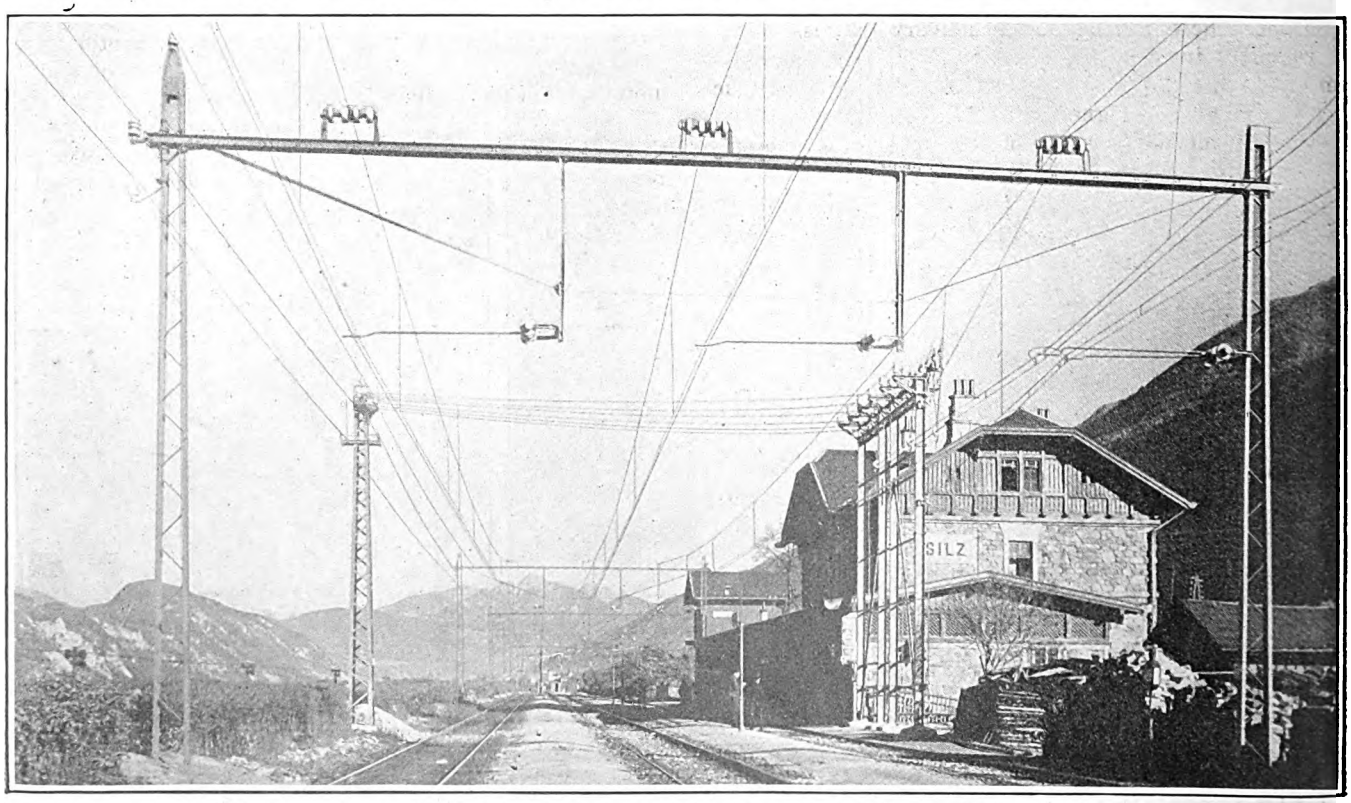
One is the type C locomotive for express trains. These locomotives are guaranteed to haul a train load of 320 tons up a grade of 3.15 per cent at a speed of from 15½ to 19 m.p.h. The electrical equipment of these locomotives was provided by the Austrian Brown-Boveri Works of Vienna.

The locomotives for local passenger trains were built by the A. E. G. Union Company, while the electrical equipment for the heavy freight locomotives was supplied by the Austrian Siemens-Schuckert Works.

Salzkammergut Electrification Finished

The second main road in Austria recently electrified is the Salzkammergut line of 67 miles total length. It also is a heavy-grade railway, with difficult track conditions, severe winter climate and many tunnels. Only one transformer substation is provided to supply the entire route, and this station receives its energy over two totally independent high-voltage lines. A double feeder line runs parallel to the road, except in one section where the catenary cable is of bronze and no feeder was required. The arrangement of sectionalizing the distribution system is very similar to that on the Arlberg road. The overhead construction, however, is much simpler, on account of less severe tunnel conditions.

Single insulation was found adequate throughout this line. The ground cable for protection against lightning is here attached directly to the tops of all steel towers. The line equipment was furnished by three Austrian



This Is a Typical Station on the Section in Which the Cup and Spool Type of Insulator Is Used in the Catenary Construction

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firms, the A. E. G., Siemens and Brown-Boveri. All three concerns made very extensive use of swinging outrigger arm construction, which is added to the catenary suspension method, the insulation being at the pole end of the arm, as shown in the left-hand illustration in the lower group on page 961.

This same view shows also the system of wire-tightening device by weights, as installed by the A.E.G. at distances of every six-tenths of a mile. In the tunnels with Siemens equipment a rather heavy double-sided wire suspension is employed.

The feeder through the 8/10-mile long Sonnstein tunnel and a number of shorter tunnels near by were made as an underground 16,000-volt cable. Without this cable it would have been necessary to carry the feeders over the Sonnstein mountain, which would have required a costly transmission line. This cable was tested with voltages up to 120,000 at 48 cycles without puncturing. Horn gap arresters are at present installed at the points where the overhead feeder enters the underground cable, but past experience has shown that future cables can dispense with this protection.

While only single insulation was provided on the Salzkammergut line, all suspension constructions are so designed as readily to permit the introduction of double insulation, should experience show that the present single insulation is inadequate.

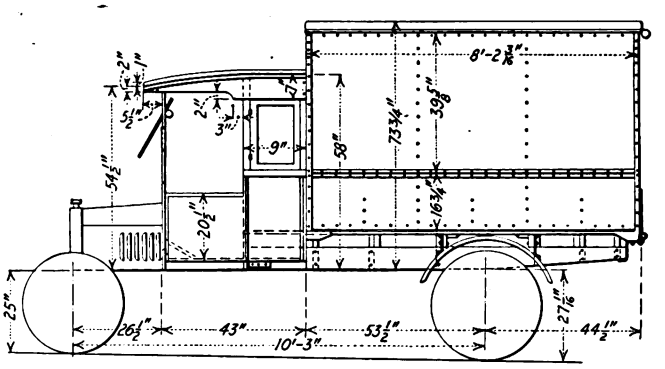
No rail bonds have been installed as yet, but so far no trouble has been experienced by their lack. Every 350 ft. the two rails are crossbonded.

Strong, Light Truck Built for Express Delivery

Illinois Traction System Uses 1-Ton Ford Chassis with Plymetl Sides and Haskelite Roof—Exterior Color Scheme Is Orange and Black

FOR the new collection and delivery express service recently inaugurated by the Illinois Traction System on its main division an unusual type of light truck is used. Bodies designed by J. M. Bosenbury, superintendent of motive power and equipment, are mounted on 1-ton Ford chassis. The framing of the bodies is of white oak, while the roof is of ¼-in. three-ply Haskelite and the sides of 5/16-in. double-faced Plymetl. The roofs of the body and cab are covered with No. 8 cotton duck, held down by copper tacks. Reinforcement of the side is provided by a 5/16-in. x 1¾-in. x 1¾-in. tee iron.

The floor of the truck body is of ⅞-in. oak and has been continued forward into the cab. The driver's seat rests upon this foundation. Thus the space at the right of the seat is available for long material which would otherwise overhang the rear end. This arrangement also permits the driver to unload many of the small packages without walking around to the back of the truck.

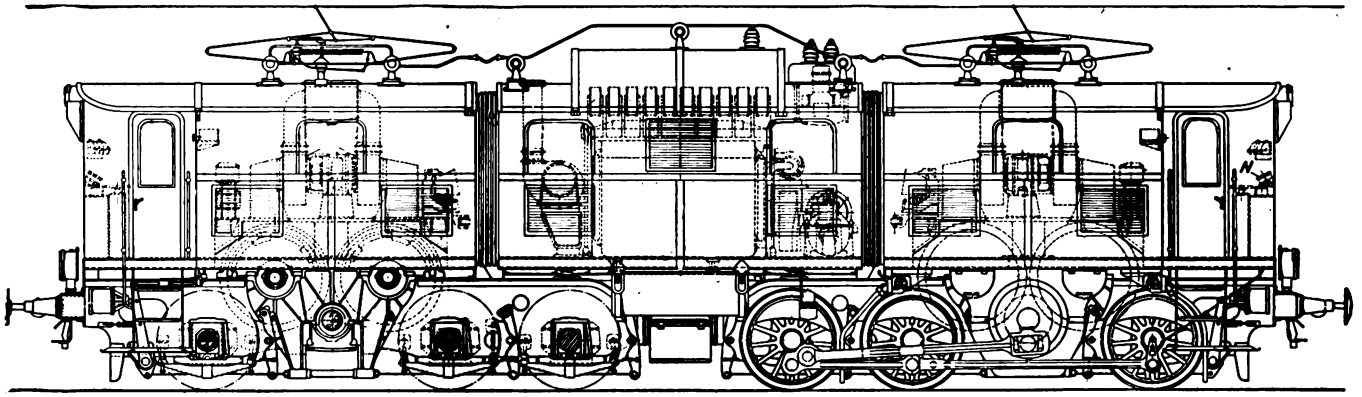


Side Elevation of Strong Light-Weight Express Truck Built by Illinois Traction System

Careful attention has been paid to painting, which is in the company's standard color scheme of orange and black. One coat of primer, three coats of surfacer, two coats of tangerine color, two coats of rubbing varnish and one of outside finishing varnish are used.

Heavy Freight Locomotive for Silesian Mountain Railways

AS PART of the electrification program for the Bavarian section of the Silesian Mountain Railways an order recently was placed with the Allgemeine Electricitäts Gesellschaft for 34 heavy-duty freight locomotives. The frame of the locomotive consists of two three-axle trucks. The driving wheels on these three axles are coupled together with connecting rods and driven from a motor gear shaft located between the outside and second pairs of wheels. Four motors are arranged in two groups in series to form two double motors. These are fed from a transformer, so that the greatest difference of potential across the terminals of the double motor is 840 volts, while the maximum potential to earth does not exceed 420 volts. Control is effected by electrically operated compressed air contactors, which are fixed on the transformer so that a short and simple wiring system made up of flat copper bars is obtained. The transformer is placed at the center of the locomotive on a bridge, the two ends of which rest on the underframe. The bearing points also serve for coupling the two parts of the locomotive frame together.



New Silesian Locomotive Has Two Three-Axle Trucks, Each Driven by a Pair of Motors

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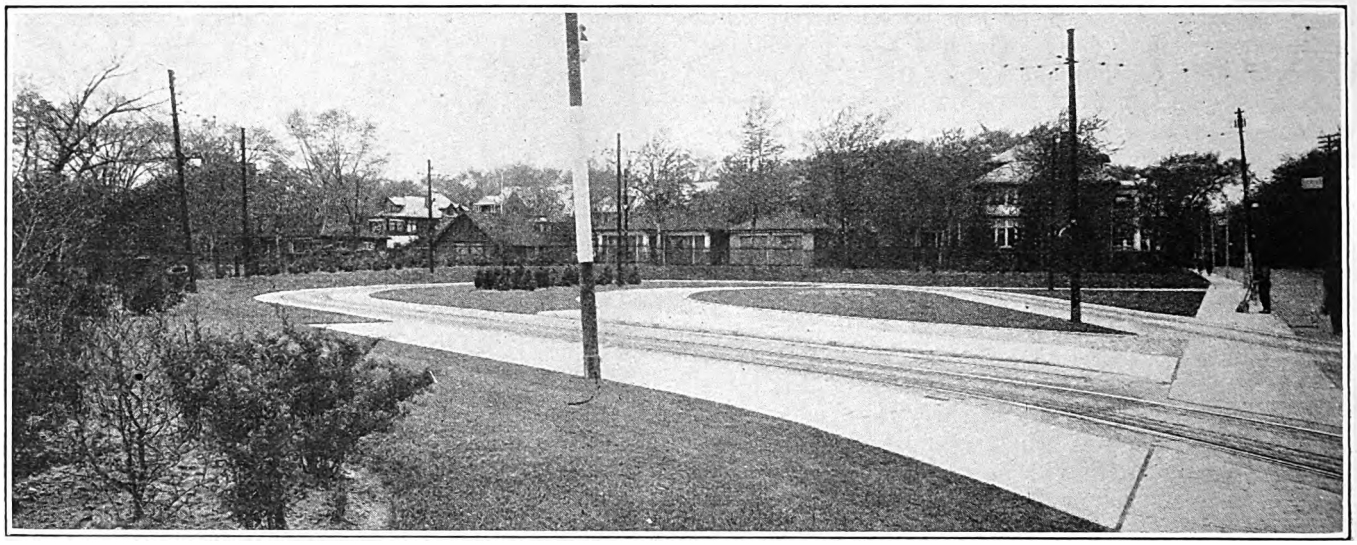


Rosedale Car and Bus Loop, Toronto, Showing High-Grade Suburban Background

The locomotive housing is in three portions and the two outer ports are rigidly connected with the underframe. They inclose the double motors as well as the cooling equipment. There is a driving compartment at each end of the locomotive for the control and measuring equipment. The middle portion of the housing is supported by the transformer bridge and incloses the transformers and the contactors. The three portions of the housing are connected together by flexible gangways. Principal dimensions of this locomotive are as follows:

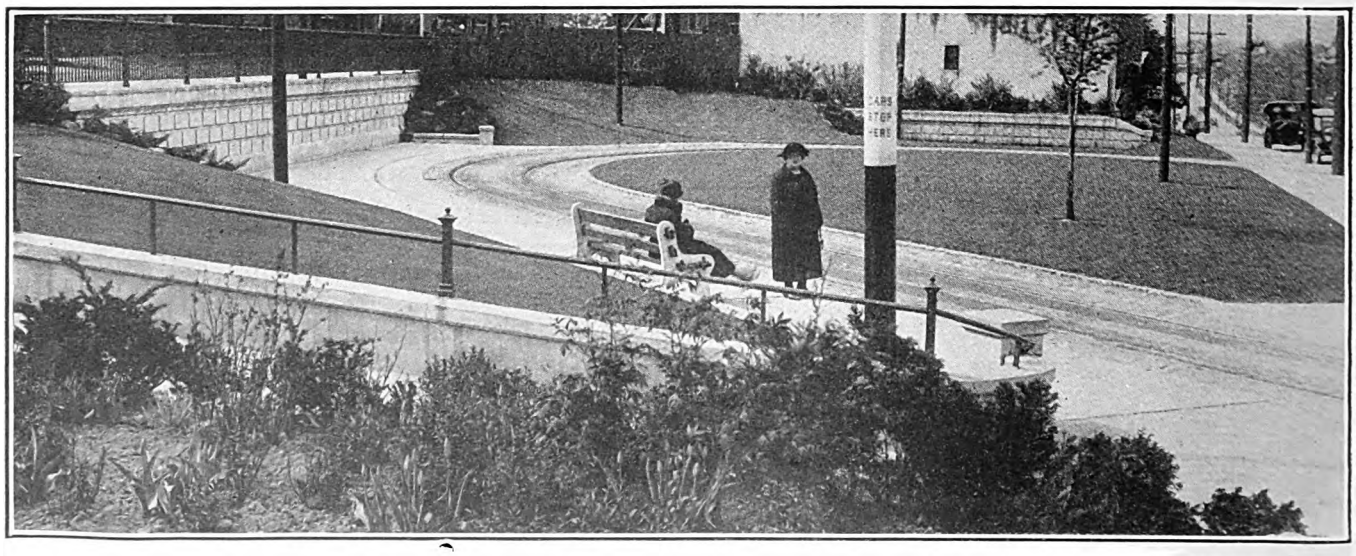
Gage	4 ft. 8½ in.
Driving wheel diameter	49½ in.
Length over buffers	55 ft.
Total wheelbase	38 ft. 9 in.
Fixed wheelbase	14 ft. 10 in.
Total weight	263,000 lb.
Weight per axle	44,000 lb.
Trolley voltage	15,000
Periodicity	16⅔
Maximum speed	34 m.p.h.
Gear ratio	1 to 4.04
Tractive effort for ten seconds	60,000 lb.

MOTOR RATINGS

One hour at 8.7 m.p.h. with tractive effort at wheels of 42,000 lb.	1,090 hp.
One hour at 18.5 m.p.h. with tractive effort at wheels of 43,000 lb.	2,300 hp.
Constant rating at 20½ m.p.h. with tractive effort at wheels of 33,500 lb.	1,960 hp.
Constant rating at 34 m.p.h. with tractive effort at wheels of 20,000 lb.	1,960 hp.

Trolley Loops Made into Parks

ONE feature of the rearrangement of mass transport system in Toronto under the direction of the Transportation Commission was the installation of new loops for turnbacks. Often the residents of a fine neighborhood do not relish the construction of a track loop in their midst, but in Toronto a different viewpoint has come about through the management's determination to make everything connected with the system a matter for civic pride. How this has been done in the case of the Lawton loop on Yonge Street and the Rosedale car and motor bus loop is shown in accompanying illustrations. The loops are in pleasing contrast to the weed-infested lot that often marks such track loops. They are veritable garden spots which a pleased public has delightedly christened "parkettes." A resident in the vicinity of the Rosedale loop fought the installation of a track loop for a long time. When he was finally convinced of the management's esthetic intentions he contributed generously himself a gift of 100 bushes. It was a happy coincidence that the erstwhile objector was a nurseryman. Track loops landscaped in this fashion not only enhance the good looks of the adjacent area, but also provide attractive boarding places for car and bus passengers.



Lawton Loop, Yonge Street, Toronto, with Bench for Patrons

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A New Local Transportation Era Is Ahead

Tendencies in Regulation, Franchise Terms, Paving Requirements, Taxation and Rates of Fare Indicate Improved Fundamental Conditions—Rapid Progress Toward Co-ordination of Various Local Transportation Agencies Being Made

By L. R. Nash
Vice-President Operating Division, Stone & Webster, Inc., Boston, Mass.

FROM time to time during the past ten years, particularly the latter half of that period, predictions have been made that the electric railway industry was rapidly approaching the end of its usefulness and would ultimately be replaced, in large measure at least, by railless transportation. Some of these predictions have been based upon the proposal to substitute bus service in New York City for certain existing railway lines. Other similar published views have been based on some abnormal, unfavorable local conditions, politics or prejudice, or have had no tangible basis.

THE advantages of terminable permits in avoiding recurrent wrangling over franchise renewal conditions, in easier and more stable financing, lower costs of money, and otherwise, are well recognized, and this type of grant undoubtedly will have an important future effect on railway financing, operations and cost of service. All these recent franchise developments tend to remove the railways from the political field and to simplify the provisions necessary for the protection of either company or public.

In spite of contrary impressions, electric railway usefulness is not declining, but is steadily increasing. The traffic now handled is greater than at any other time in the history of the business. Every census of the industry has shown an increase in per capita electric railway riding over that of the preceding period. Between these five-year compilations there have been temporary recessions in traffic as well as in revenue, and this has also been true since the latest census. A year ago the traffic figures were not encouraging, but more recently there has been a noteworthy gain for the industry as a whole. This has not been shared by all companies, the best showings being made by the large city systems and the poorest by the smaller urban and interurban lines.

The phenomenal increase in motor vehicles has obviously diverted a large amount of traffic from rail service of all classes. The total motor vehicle registration in the United States is now close to 20,000,000. For several years automobile experts, as well as others, have predicted the approach of a saturation point in the use of passenger vehicles. However, with present registration equivalent to the number of families which could possibly afford or use an automobile, the manufacture of such vehicles still continues at an unprecedented rate. There are present indications that the "knee" in the curve of per capita registration has been reached and that future production will be limited, to an increasing extent, to replacements, export and the needs of expanding population. The increase in railway traffic in the larger cities is undoubtedly due in large part to the congestion of vehicular traffic, its increasing inability to move readily through or into business streets, and the lack of convenient parking facilities, all of which tend to discourage unnecessary use of private vehicles.

That the industry itself has not lost confidence in its future is shown by the fact that its 1926 budgets show greater provision for upkeep and extension of property than for several preceding years. Furthermore, in spite of abandonments of trackage in favor of bus service or otherwise, there was a substantial net increase in track mileage owned and operated in 1925, as was also the case in the preceding year. Although the evidences of renewed vitality and progress above cited are encouraging, there are other factors which more fundamentally affect the future of local transportation.

Regulation Bringing Transportation Stability

Electric railways are, and for some years have been, subject to regulation in more than three-fourths of our states. There has been no recent substantial change in the character of this regulation affecting rail service. There have, however, been radical increases in the adoption of regulatory methods in the broader field of transportation in which electric railways are now interested. This has included the conferring of rights upon electric railways in many states to carry on supplementary bus service and the regulation of such service whether conducted by railways or independent operators. All but ten states now have regulatory statutes covering the operation of buses. In 1925 ten new acts were passed and fifteen existing acts were amended to give more complete control over bus service. During the 1925 sessions of the state legislatures some 2,400 bills were introduced affecting bus service, 150 of them dealing directly with problems of regulation. Most of the states now lacking general supervision over bus service are located in the South, or in Western sections where low density of population has not invited this type of transportation. Generally speaking, the period of unrestrained and erratic competition between different kinds of trans-

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portation, which has continued for more than ten years, has passed, and an orderly development of transportation on economic lines, with due recognition of the rights and duties of existing agencies, may be expected in the future.

The bus regulatory acts commonly include the requirements of a certificate of convenience and necessity, a substantial bond for protection against accidents, regular service over designated routes at stipulated rates, and other minor regulations consistent with those in effect for other classes of public service—all of which contemplate the elimination of uneconomical competition. Adequate supervision of interstate bus business is still lacking. Subsequent to decisions of the United States Supreme Court in 1925, which designated specific limits to state regulation of interstate carriers, the state commissions and others interested in the matter drafted a bill which was introduced in Congress by Senator Cummins, providing for joint regulation of interstate carriers by the commissions of the several states in or through which the service was rendered, with appeal to the Interstate Commerce Commission in case of failure of these commissions to agree. This bill, although indorsed by the National Association of Railroad and Utilities Commissioners and national organizations of motor vehicle operators, was opposed by certain local interests and failed of passage. It will undoubtedly have further attention, and it is of interest to note that a similar bill has been drafted for submission to Congress to regulate in a similar way interstate transactions in electric power, which business is becoming increasingly important. It is generally agreed that centralized federal regulation of utility business, some part of which crosses state boundaries, is not desirable, and that joint regulation by the several states whose boundaries are crossed is both logical and practicable. The crystallization of these views into the necessary federal legislation will be of material advantage to the industry.

Recent Franchises Show Greater Flexibility

In recent years service-at-cost franchises have increased in number and have been improved in some substantial respects. The new railway franchise effective in Cincinnati last year eliminated certain of the undesirable features of its predecessor of the same form, including a removal of the old franchise tax and the cancellation of the city's claim to collect back taxes of this kind which were not earned. This franchise also eliminates paving charges, other than for repairs, and provides for an extension from time to time of the life of the grant under conditions somewhat similar to those in the well-known Cleveland franchise.

The Cleveland franchise has also just been amended in important respects, including an increase in the limits of the barometer fund consistent with the growth of the business, an increase in the range of permissible fares with a 10-cent maximum limit instead of 6 cents previously fixed, and a 1-cent higher fare in suburban areas than prevails in the city. These and other minor changes, together with an extension of the term to 1950, will permit more liberal expansion of the property and improvements in service.

The Grand Rapids service-at-cost franchise, operative since 1922, contains two desirable features: (1) A blanket right to occupy any streets on which service may be needed, without the formalities of supplementary grants, instead of the usual lengthy description of specific and exclusive locations, and (2) a provision that service may be operated by electric cars, trackless trolleys, or otherwise, thus recognizing the rights and obligations of the company to render local transportation service by whatever means are appropriate from time to time.

Increasing attention is being given to the subject of real estate assessments for partial payment of the cost of rapid transit or suburban railway lines. Such added service always brings about a large increase in real estate values which have been enjoyed wholly by the owners of such property. The proposal that a part of this increase in value shall be applied to the development of the transportation facilities which occasion it is receiving logical and increasing support from civic authorities. A detailed plan has been developed in Detroit in connection with rapid transit lines and similar plans are under consideration in New York, Chicago and elsewhere, the outcome of which may be more liberal extension of railway facilities without the prohibitive burdens upon their owners which have formerly existed.

There is still a lack under service-at-cost franchises of an incentive to sustained maximum efficiency of operation. This lack has been pointed out by many writers and in the decisions of regulatory commissions. It is obvious that a fixed wage without hope of advancement or other reward is not conducive to efficiency or progressiveness, and this principle is as applicable to the wages of money in public service as to those of an individual worker. The momentum in public utility alertness and efficiency developed in early years is still in evidence in spite of present regulatory limitations, but it is not logical that it should continue indefinitely.

The terminable form of franchise is receiving increasing attention. It is now effective in only a comparatively few states, and wider use requires supplementary legislation. Such legislation has been urged by the National Association of Railroad and Utilities Commissioners in connection with an indorsement of this form of grant and by many other organizations and prominent individuals. The Illinois Legislature now has a committee investigating this subject, with particular reference to its application to Chicago railway service. The advantages of terminable permits in avoiding recurrent wrangling over franchise renewal conditions, in easier and more stable financing, lower costs of money, and otherwise, are well recognized, and this type of grant undoubtedly will have an important future effect on railway financing, operations and cost of service. All these recent franchise developments tend to remove the railways from the political field and to simplify the provisions necessary for the protection of either company or public.

Railways Gradually Winning Paving Relief

The prospect of continued and increasing relief from the paving charges with which electric railways have illogically been burdened since horse car days is encouraging. Reference has already been made to the omission of such charges from the recent Cincinnati franchise, and other modern drafts show similar omissions. Recent specific cases to the number of more than 60 have come to the writer's attention in which permanent or temporary relief from paving charges has been granted by legislative acts, commission orders or franchise or other city ordinances. Nearly one-half these cases involved franchise modifications. A New Jersey

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Senator recently stated, in behalf of a blanket paving relief act, that eight other states had already granted such relief.

The sentiment of regulatory authorities, as well as other students of the economics of the situation, are wholly in favor of the elimination of charges in connection with paving aside from maintenance and other minor costs incident to railway service. This is abundantly shown by an increasing volume of commission decisions and other published statements. An interesting case is that of the New York & Queens County Railway in 1924, in which the commission authorized a specific increase in fare in connection with each paving job forced upon the company, such increase to remain in effect until the cost of the paving had been amortized. Other commissions have authorized removal of tracks to avoid paving assessments, and otherwise expressed disapproval of the practice that imposes upon car riders a burden which not only is entirely foreign to the service they receive but subjects them to added delays in this service. In a recent book the writer referred to paving charges as the "outstanding anachronism of the industry," and such characterization seems wholly justified by the authoritative statements and actions referred to above.

The ultimate satisfactory solution of the paving problem lies in the education of the public regarding the issues involved. When car-riding citizens who pass upon franchise provisions, either directly by referendum or through the selection of their administrative officials, clearly understand the injustice involved in their paying for paving which their more prosperous neighbors use for pleasure or business, they will relieve themselves of such payments. The practice adopted by many railway companies of publicly pointing out the effect of paving charges on fares, through newspapers, billboards erected on paving jobs, and otherwise, should be commended as an effective step in this program of education. If the millions of dollars now annually spent on paving work were wholly applied in the future to improved equipment and service er lower fares the public would not be the sole beneficiary, for the railways would share in the gain through increased traffic.

Taxation Relief Must Come

The railway industry has from time to time protested against the heavy burden of taxes and other imposts heretofore carried. The industry does not object to taxes consistent with those assessed upon other property and business, but contends that taxes and imposts amounting to 10 per cent of annual revenues, and in many cases an amount in dollars greater than is distributed to the owners of the properties, are inconsistent with the charges paid by other industries for the support of government. Increasing attention is being paid by tax authorities to a revision of the old system of public utility taxation, including a substitution for all other taxes of a proportion of gross earnings varying between certain limits with net earnings, and early relief is to be expected.

The industry has also pointed out the injustice of federal taxes on its income and that of its employees, whereas corresponding income derived from municipal undertakings of similar character is exempt. The current federal income tax law removes this exemption from municipal employees, but the rest of the program awaits further consideration. Such actions, although only indirectly helpful, indicate a favorable attitude on the part of national authorities in spite of their lack of intimate contact with utility affairs.

IT IS not unreasonable to look forward to the time when at least the majority of the 60,000 buses now operating in common-carrier urban and interurban service, and for terminal, school and other special traffic, together with a substantial part of the urban taxi business, may be brought into co-ordination with railway systems, with a large gain in load factor and efficiency of operation and a corresponding saving in ultimate total investment. This is believed to be the outstanding present opportunity for transportation development.

The field of co-ordination of various forms of transportation, urban and otherwise, is a most promising one for cultivation by electric railway officials. Only a few years ago the industry looked on the motor bus as a competitive nuisance, but there has since been a revolutionary change in viewpoint. In 1920 only sixteen railways operated bus service as an auxiliary to rail lines. Today nearly 300 companies, or more than one-third of the total number in the United States, are operating buses to the number of about 6,000 over 15,000 miles of route, carrying about 800,000,000 passengers per annum, and involving an investment of upward of $40,000,000. These operations probably include more than 25 per cent of all common-carrier bus service, and the proportion is rapidly increasing through added railway buses, purchase of competing equipment, or abandonment of unprofitable independent service. The ratio of bus service, traffic and investment to total corresponding figures of the industry is small, but there is increasing appreciation of the advantages of buses for scattered traffic, for suburban development service and to avoid expensive track reconstruction even where traffic is comparatively heavy.

The data so far accumulated on the revenues and costs of bus service are still too meager to justify definite conclusions as to the extent to which it may economically replace rail service. It is possible that in a considerable number of cases enthusiasm over the attractiveness of bus service has led to an unwarranted frequency or extent of such service, and that adequate net income has not had sufficient attention. Time and accumulated data will permit the correction of earlier mistakes. The substitution for the time being of railway buses for previous competitive buses without adjustment in their numbers or in the associated rail service also accounts for some instances of unprofitable operation.

Some years ago the writer expressed the opinion that

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there was a possibility of further co-ordination between railway and motor-vehicle business in connection with the service now operated by taxicabs. Although these vehicles render exclusive service, there are abundant opportunities for co-ordinating it with rail transportation, including what may be called "pick-up-and-delivery" service, giving passengers convenient transfer between home and railway lines or railway lines and destination, particularly in inclement weather, using railway lines for long intermediate and expensive haul. A through fare system and prearranged taxi connections would add to the convenience of such service. The experiments in this direction which have recently been projected in Philadelphia should be watched with particular care.

Traffic congestion on the streets of our large cities is caused to a material extent by the idle cruising of taxicabs in search of fares. If this cruising could be eliminated by the establishment of a central transportation agency connected with a suitable number of accessible points from which taxis could be summoned speedily, and cruising were correspondingly restricted, the problem of traffic congestion would be much simplified in the interests of both railway service and other necessary users of the streets. It is not unreasonable to look forward to the time when at least the majority of the 60,000 buses now operating in common-carrier urban and interurban service, and for terminal, school and other special traffic, together with a substantial part of the urban taxi business, may be brought into co-ordination with railway systems, with a large gain in load factor and efficiency of operation and a corresponding saving in ultimate total investment. This is believed to be the outstanding present opportunity for transportation development.

Fare Trend Encouraging

The trend of electric railway fares has been distinctly encouraging. The present level is approximately 50 per cent higher than that of 1914, and is as high as at any time since the movement away from the older universal 5-cent fare began. The number of cities in which a 10-cent cash fare is in effect has steadily increased, now totaling more than 80 out of the 288 cities having a population of 25,000 or more—a greater number than is found with any other rate of cash fare. The number of lower cash fares, particularly 6 cents and 8 cents, has correspondingly decreased, and the number of these cities which still retain a 5-cent fare for universal transportation is practically negligible. With the 10-cent cash fare, lower rate tickets are sold where costs warrant, thus combining the desirable simplicity of a single coin fare with concessions to regular riders.

A word of caution may not be inappropriate at this time in relation to bus fares. Many companies inaugurating bus service have made charges therefor identical with rail service, with transfer privileges. Doubtless in many cases this practice is necessary because of the abandonment of earlier rail service over the same routes or the use of buses as substitutes for extensions of rail lines. It is, nevertheless, true that scattered and irregular traffic, which buses largely serve, is unprofitable with either cars or buses, and that rail service is more economical for mass transportation. The intermediate field for profitable operation of buses at rail rates of fare is limited.

Bus service is undoubtedly popular with the traveling public, and if parallel bus and rail service were available, many people would prefer to pay more for the bus service than for the less attractive car ride. This fact is demonstrated by the experience of various companies. If the public prefers bus service and is willing to pay more for it, the companies, particularly in the formative years, should not saddle themselves with unprofitably low rates which cannot later be increased without excessive complications. The experience of railways with the 5-cent fare and the rapid obsolescence of the early types of electric railway equipment should be a warning to the industry not to establish unwise precedents in bus fares under present experimental conditions. The unprofitable character of the bus business in California, where it is most systematically and extensively developed, and the recent spectacular failure of a pretentious interurban bus project in Indiana should be a warning against ill-considered action with respect to rates of fare.

Great Effort Toward Civic Co-operation

Reference should also be made to the active participation of various railway properties in the study and solution of the intricate problems of city traffic regulation. The results so far secured through car and vehicle rerouting indicate further relief, with increased car speeds in business districts and consequent decreased cost of the passenger haul. In other ways, also, railways are taking a more active part in community life and are making special efforts to improve their equipment and increase the attractiveness of their service. This has involved capital expenditures, but substantial operating economies have resulted. It is interesting to note that more than 60 per cent of the new passenger cars purchased in 1925 were equipped for one-man operation, indicating the general satisfaction with one-man service and its payroll economies. The credit standing of properties engaged exclusively in railway business has not as yet shown general improvement, and such improvement cannot be expected in some cases. The industry as a whole, however, may confidently look for a gradual improvement and a return of investment confidence.

Railways Are Not Superannuated

The foregoing discussion has at least suggested that the electric railway industry is not superannuated and obsolete and that the wiping out of its $6,000,000,000 investment is not imminent, as has been claimed recently by a prominent steam railroad official. On the contrary, it appears that the industry is just entering upon a new era of broadened activity and usefulness in which it will have opportunity to demonstrate the soundness of its recently emphasized views that the common-carrier service of the cities is its job, to be carried on with due regard not only to economy in investment and operation but also such liberality and refinement in facilities and service as the public is able and willing to support. Railway executives are every-day folks. They have had more than their share of discouragements in past years, but the skill and persistence with which they have attacked and overcome their difficulties gives assurance that they can successfully function in the broader field now open to them. They need one other quality in their new job—vision. The writer believes they have it and can and will develop it further as occasion arises.

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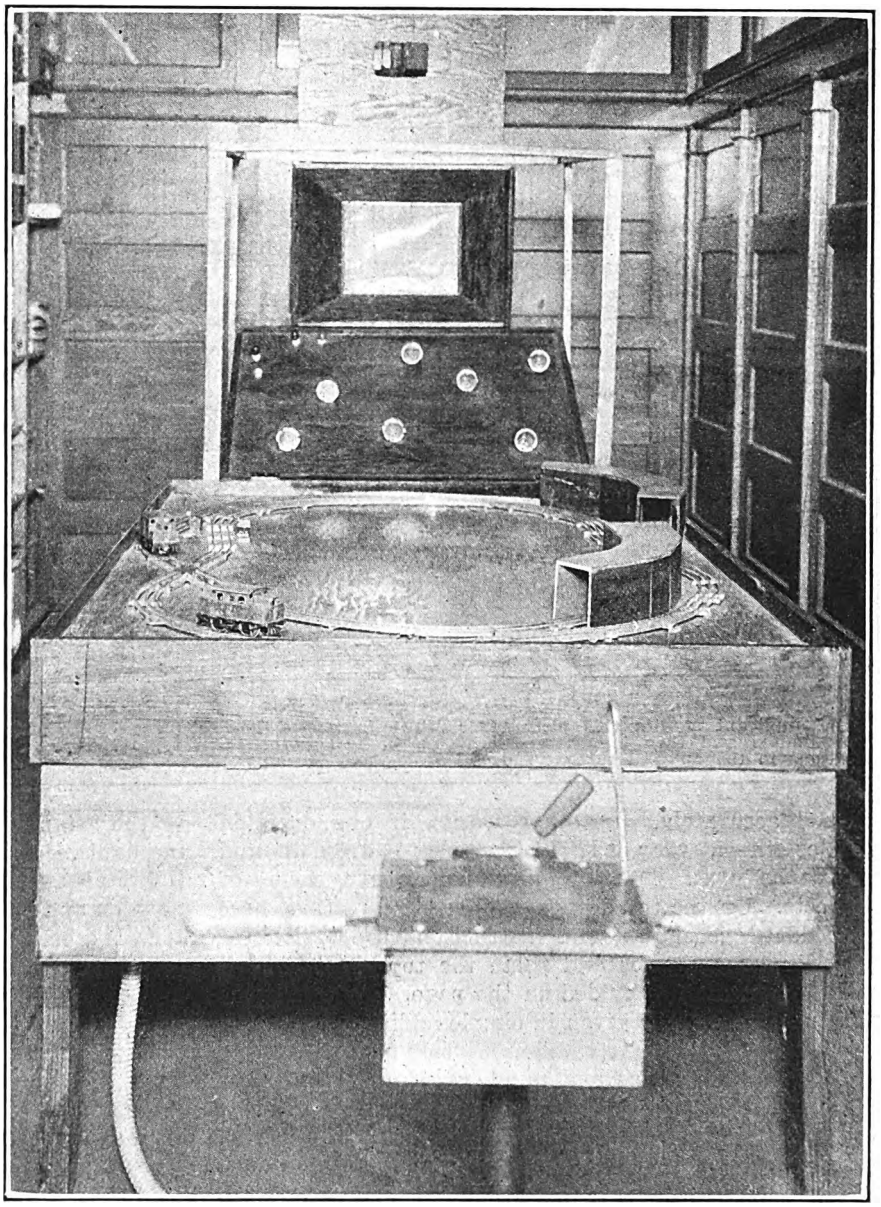
P.R.T. Improves Selection and Training Methods for Employees

Psychological Tests Interposed Into the Process of Selection in Order to Eliminate Candidates Who Are Inherently Unqualified for Platform or Bus Service—All Platform Men Are Trained for Both Motorman and Conductor Duties, so that They Are Interchangeable for Two-Man Operation and Qualified for Duties of the One-Man Car Operators

CHANGING conditions of our civic life have reflected themselves in the greater care exercised by many of the larger companies in the selection and training of car and bus operators. The Philadelphia Rapid Transit Company has been reviewing its methods for a number of months and has announced important changes and additions to its program that are calculated to improve upon the caliber of men through scientific selection and the better training of the successful applicants. Even after men have been trained and are regular operators an elaborate follow-up system will continue to guide them and record their progress.

In a consideration of the Philadelphia methods it is well to realize two fundamental things that differentiate this company's policies from those of many others. First, the company has long since adopted a policy of not reemploying men who have voluntarily left the service. A more recent policy is that all platform men employed must be selected and trained for one-man operation. An applicant breaks in as a motorman and after a month or so receives the additional training necessary in the duties required of conductors. In this way a new man is qualified for operation of either end of a two-man car or a one-man car.

Bus operators are selected in a similar manner to trainmen.



New Psychological Testing Equipment Used in Philadelphia

This view shows the laboratory equipment for the second and third phases of the psychological test used by the Philadelphia Rapid Transit Company. The first phase of this test is the paper test and is given in groups. The last two phases are individual tests which require about a half hour. The applicant stands in front of the small upright table with the several handles in front of him. There are also two pedals, one arranged to be operated by the left foot and the other by the right.

PROGRAM OF SELECTION

During an initial interview requiring from five to fifteen minutes by the assistant employment manager the applicant is questioned closely about his past experience, his social and marital condition and a number of references are obtained. This information is noted by the examiner on cards, a different color being used for the different classes of employees, such as train service, bus service, bus mechanical, way and structures, office employees. Whether the applicant is later employed or not, this card remains as a record of his request for work.

If the applicant passes this preliminary examination he proceeds to the medical department, in the same building, where he is given a quite thorough physical examination, covering eyes for vision and color blindness, ears, major physical defects, hernia and foot trouble.

The applicant then writes his own application and states in his own words the general information re-

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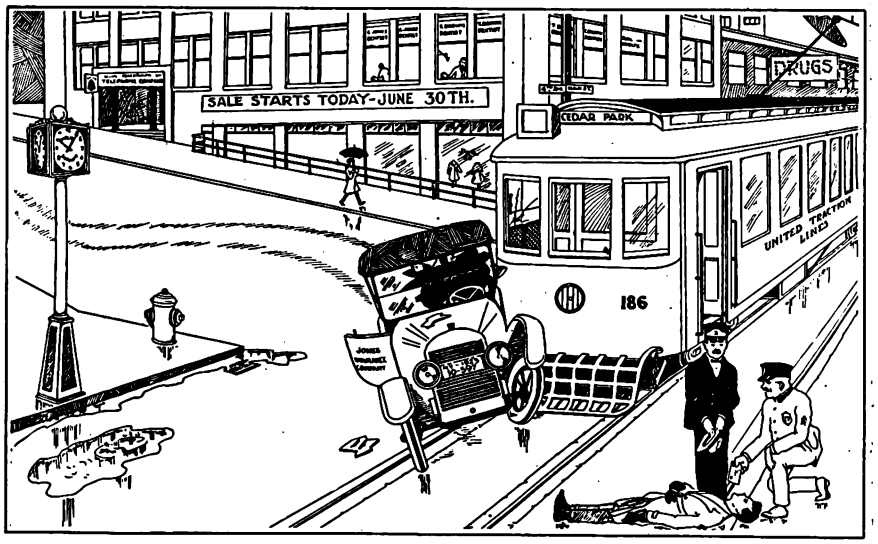
quired and gives the references with which he wishes the company to communicate.

Applicants for positions in the train service are being tested at the present time, although no rejections are being made on this basis until standards for rejection have been determined. Such standards are being developed by comparing performance on tests with observed results from work on the cars.

The psychological examination as performed in Philadelphia is in three phases: First, a paper test is given. This test may be administered to a group of applicants equally as well as to one or two. It is a test of the so-called mental alertness type, consisting of a set of thirteen pages and 44 questions. Before the blanks are distributed the applicants are told that they are going to be given this written test and that they will be given a certain limited time to complete it. The object of the examination is to see how much can be accomplished accurately. In other words, if one question puzzles them, they are instructed to drop it and go to the next. The 44 questions cover a series of subjects. On the third page of the test a picture, here reproduced, is shown, and instructions are to look at this for two minutes and paste the top sheet over it with a gum strip provided on the page. Following the picture a problem is given in simple addition. The second question gives instructions pertaining to the association of five names and numbers. Further on other simple arithmetical problems are given, and question seven is the first referring to the content of the picture on page 3. In this way, through the 44 questions, the same subjects are repeated in what psychologists call the spiral order of questioning. Several of these questions and answers are reproduced in these pages to illustrate the plan of this test.



A Memory Picture in the Paper Test

The applicant studies this picture for two minutes and then is asked several questions in the spiral test that follows. This is part of the first phase of the psychological examination for P.R.T. trainmen and bus applicants.

The student now passes to the second phase of the psychological test, which introduces a new element into this class of work. By referring to the illustrations showing the psychological laboratory equipment it will be seen that there are two toy electric tracks. Each of these tracks is in the form of an irregular circle, one interposed on the other, so that there are two intersections, one on either side of the table lying immediately in front of the subject being examined. Also, the tracks are so laid at the rear of the table that there are two points, one on the right-hand side and one on the left-hand side, in which the curves represent non-clearance curves. The toy locomotive on one track is started by the examiner and passes around the track at a predetermined speed. The train on the second track is called the subject's train and is controlled in speed by the applicant, through moving the switch which can be seen in the illustration, located between the two side handles, either to the left or to the right. A small counter is arranged so that the number of revolutions of both trains are counted automatically. The trains revolve about the tracks in the same general direction; that is, counter-clockwise. Tunnels are provided for both the record and the subject's train, so that the movement through these blind areas must be estimated by the student.

The object of this test is to move the subject's train around its track as rapidly as possible and at the same time to avoid collision at either of the two intersections or the two non-clearance points at the rear of the table. This apparatus is shown to the student and he is told how he may control the speed of the train and is then instructed to proceed. He is given two minutes of this test. Then a second period of two minutes is given under slightly changed procedure. This test was designed to gage the ability of the applicant to judge speed and distance as well as his "recklessness" in operation.

The third phase of the psychological test is then entered. This is a development of the test originally designed for the Milwaukee Electric Railway & Light Company by Dr. Viteles, a description of which process appears on page 624 of the April 10 issue of ELECTRIC RAILWAY JOURNAL. This part of the test, known in Philadelphia as the "signal phase," is operated by the motor-driven mechanism shown in one of the views. The seven lights ahead of the applicant being tested are made to flash on and off in a regular sequence, but at regular intervals a bell is made to ring or a horn is made to sound coincident with one of the flashes. When either the bell or the horn is sounded this signal requires a certain response from the applicant, who stands in front of the upright mechanism seen in the foreground of the picture. Some definite move of the two handles or the two pedals is required for each signal. The applicant is trained in a regular manner and his actions are recorded on the tape for a period of sixteen minutes. During this time the examiner notes the readiness with which the applicant learns to respond to signals. After a moment's rest when the sixteen-minute training period is over the actual test is given, which lasts for six minutes. A record tape is made and the applicant's responses are checked on this tape after the test has been completed. Whenever the applicant makes a response to the bell or horn or disappearing light signal, he sees a small light in the upper left-hand corner of the panel facing him, which shows that he has made the correct response. The instant of this response is also recorded on the tape.

The distraction light, which was used in the Mil-

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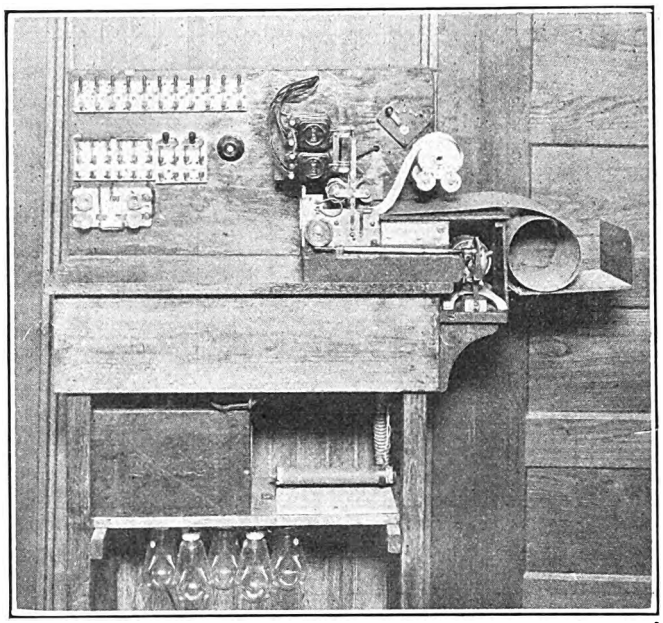
waukee laboratory, consisting of a 150-watt lamp that flashed on at definite intervals during the test period, has been supplanted in the Philadelphia test by an arc light, which has been arranged to flash violently on and off so that the distraction is partly visual and partly auditory. When this signal occurs the operator must perform a certain combination of movements to make the proper response. This distraction light can be seen through the window at the top of the apparatus facing the subject being tested.

A further variation in this equipment is the flashing on of typical street scenes by means of a small projecting lantern at the back of the equipment. Pictures become illuminated at certain definite periods of the test on the small screen seen directly in front of the applicant being tested. This portion of the test was developed for the psychological test now given to taxicab drivers in Philadelphia under Dr. Viteles' direction. This is of particular value for use in selecting applicants for bus drivers as well as taxicab operators. This use of street scenes is quite new and standard procedure for its use has not been developed.



The Operating and Recording Mechanism for the Flashing Lights Which Give Visible or Audible Signals and Record the Responses that the Applicant Makes

After Selection Comes the Training Period

The psychological tests are estimated to require about one hour. The paper test requires half the time and can be given in groups. The other half hour is an individual test in the laboratory.

Assuming that he has passed all of these tests, the applicant is then sent to the training school.

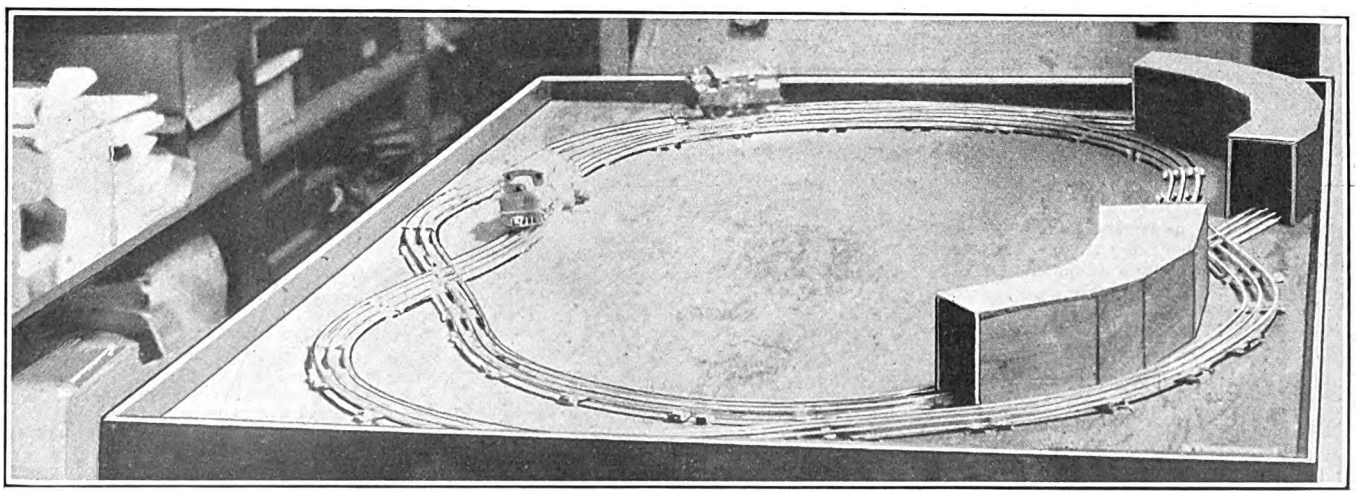
The development of tests ties in very closely with the whole training program, which is in reality an advanced phase of selection, since no man is finally qualified until he has completed training and demonstrated his ability to operate. The entire training procedure is at the present time being subjected to a thoroughgoing analysis and will be fundamentally reorganized. Several important changes in method are still under consideration. Conclusive results from these cannot be anticipated for some time to come.

Following up the student is considered of great importance. On form PT-130, made up on a letter size sheet, the complete employment department's record of each applicant, his training and his follow-up record are entered. The preliminary rating is determined from the first four days that the man spent in the instruction school. The line rating is determined from the ten days that he spent on the cars with the motorman trainer. His final rating is determined from his examination in the school after the fourteen or fifteen days' initial training period. The total rating is based on all of these elements, plus observations of safety and power saving. A place for a record of supplementary training is given on this card and provision is also made for the follow-up record, reports on which are obtained each week on operating, safety and power saving.

On the reverse side of this form is the transportation department's record, showing the operating hours as conductor or motorman. A notation as to power saving and accidents is made and places to record other points, such as absences, misses, violations, reports of courtesy and discourtesy, are provided.

Scientific Background of Psychological Work

It is estimated that several months more will be required before sufficient data are obtained from the new applicants that are being employed every day in order to



A Close-Up of the Train Test Used by the Philadelphia Rapid Transit Company in Selecting Employees

On the table in front of him is the train test, two trains that operate in a counter-trackwise direction, one running at a predetermined speed and the second controlled by the small handle seen on the operator's upright stand. There are two crossings and two non-clearance curves at the rear of the table where collisions may occur. The test is to operate the subject's train around the track the greatest number of times in a two-minute period, with the least number of accidents.

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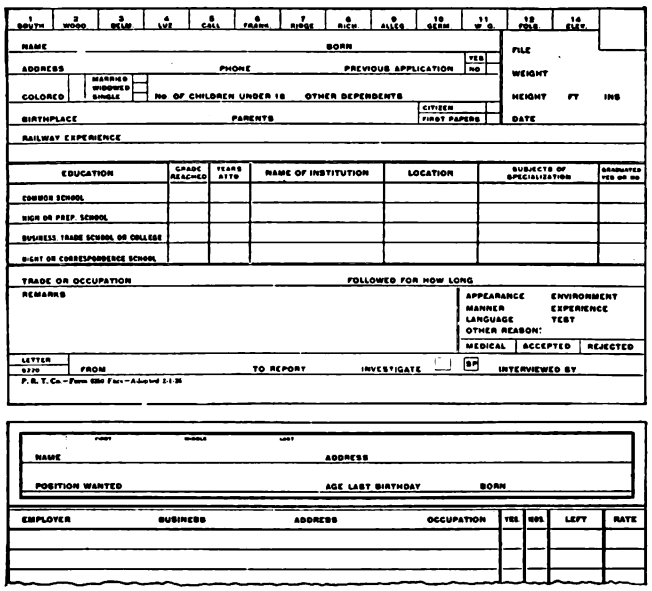

NAME BORN FILE
ADDRESS PHONE PREVIOUS APPLICATION YES NO WEIGHT
COLORED MARRIED WIDOWED SINGLE No. OF CHILDREN UNDER 16 OTHER DEPENDENTS HEIGHT FT INS
BIRTHPLACE PARENTS CITIZEN FIRST PAPERS DATE
RAILWAY EXPERIENCE

EDUCATION	GRADE REACHED	YEARS ATTD	NAME OF INSTITUTION	LOCATION	SUBJECTS OF SPECIALIZATION	GRADUATED YES OR NO
COMMON SCHOOL						
HIGH OR PREP. SCHOOL						
BUSINESS, TRADE SCHOOL OR COLLEGE						
CORRESPONDENCE SCHOOL						

TRADE OR OCCUPATION FOLLOWED FOR HOW LONG
REMARKS
APPEARANCE ENVIRONMENT MANNER EXPERIENCE LANGUAGE TEST OTHER REASON:
MEDICAL ACCEPTED REJECTED
LETTER FROM TO REPORT INVESTIGATE INTERVIEWED BY
P. R. T. Co.—Form 6386 Face—Adopted 2-1-26

NAME ADDRESS
POSITION WANTED AGE LAST BIRTHDAY BORN

EMPLOYER	BUSINESS	ADDRESS	OCCUPATION	YRS.	MOS.	LEFT	RATE

Face and Back of Form Filled Out in the Original Interview for Applicants for Platform Service. Similar Cards of Different Colors Are Used for Other Classes of P.R.T. Applicants

form a proper basis for establishing final standards for selection of applicants, involving the rejection of those found unqualified.

Morris S. Viteles is the consulting psychologist for the Philadelphia Rapid Transit. Dr. Viteles, who is also assistant professor in the department of psychology at the University of Pennsylvania, has had a wide experience in this branch of personnel work, having designed the early equipment used by the Milwaukee Electric Railway & Light Company which was described in the article referred to previously. Included in this story was a historical outline of the development of this class of tests given to applicants in the electric railway industry.

Common to all scientific applications of a genuine nature, a considerable air of modesty surrounds the work and results claimed. The paper test is designed to bring out the simple, although fundamental, qualities of mental activity and persistence that are necessary to the job. The mechanical test in its two phases is designed to measure in a comparative manner the inherent qualities of the applicant's mental and physical makeup; also, his co-ordination is determined in the

Sample Questions from Paper Test of Mental Alertness

Several questions picked at random from the complete list of 44 questions which comprise the first phase of the psychological test recently started by the Philadelphia Rapid Transit Company's employment service. This portion of the test is known as the paper test. Each applicant is given a complete copy of the 44 questions and told that he will be given a limited time in which to answer the questions and that he will be rated on the number he has answered and also the accuracy.

7. Answer the following question about the picture of the automobile accident which you observed:

What was the name of the street the car tracks were on?

Answer: .....

8. Look at these names and numbers:

1	2	3
Oakland	Valley	Downing
4		5
Retreat		Longland

Write alongside of each name below the number which belongs to that name.

Retreat	Valley	Downing .....
Oakland	Retreat	Longland .....
Downing	Longland	Retreat .....
Longland	Oakland	Valley .....

9. Put a Cross Before the Best Answer to this Question:

If you fell asleep on a train and rode 10 miles beyond your station, what would you do?

———Pull the bell rope and stop the train instantly.
———Tell the conductor to take you back.
—×—Get off at the next stop and take another train back to your station.
———Jump off and walk back.

The best answer to this question is "Get off at the next stop and take another train back to your station," so you must place a cross (X) before this answer. Make no mark on the other blank lines.

This is a sample problem to show you how the others like it are to be done.

13. Tokens cost two for 15 cents and exchanges 3 cents apiece.

A passenger hands you a dollar bill and asks for four tokens.

What is the smallest number of coins you could give back in change?

———Dollars ———Halves ———Quarters
———Dimes ———Nickels ———Pennies

14. Put a line under the letter "A" below:

A B C D E F G H I J K L M N

You must draw a line under the letter "A" because this is what the directions tell you to do.

15. Draw a circle around the largest number and a line through the smallest number below:

57 19 41 3 101 11 17 99 32

16. Write alongside of each name below the number which belongs to that name:

Valley	Downing .....
Longland	Oakland .....
Retreat	Valley .....
Oakland	Retreat .....

Turn back and look at question 8 if you cannot remember the numbers. Do not guess.

17. Answer the following question about the picture of the automobile accident which you observed:

What is the number of the motorman?

Answer: .....

29. Write alongside of each name below the number which belongs to that name:

Longland	Retreat .....
Valley	Downing .....
Oakland	Valley .....
Longland	Oakland .....

Turn back and look at question 8 if you cannot remember the numbers. Do not guess.

30. If three pencils cost 5 cents, how many pencils can be bought for 50 cents?

Answer: .....

31. Answer the following question about the picture of the accident which you observed?

To whom does the automobile belong?

Answer: .....

32. Write alongside of each name below the number which belongs to that name:

Oakland	Retreat .....
Valley	Downing .....
Oakland	Valley .....
Longland	Oakland .....

Turn back and look at question 8 if you cannot remember the numbers. Do not guess.

33. Put a cross before the best answer to this question:

If you see two automobiles collide on the tracks about a half a square ahead of the car you are operating, what would you do first?

———Bring the street car up to the accident so that you can observe it more closely.
———Pass cards around among the passengers in order to obtain their names as witnesses.
———Bring your car to a stop immediately at a distance from the accident.
———Drive your car up so that you can use it in clearing the track by pushing the wrecked automobile off.

34. Above the first letter below make a cross. Draw a circle around the letter which follows it in the alphabet and a line from this to the last letter below:

J A R N P K L O S T V A

42. Answer the following question about the picture of the automobile accident which you observed:

From what state is the automobile?

Answer: .....

43. Tokens cost three for 25 cents and exchanges 3 cents apiece.

A passenger hands you a $2 bill and asks for nine tokens and nine exchanges. **Note the change in the price of tokens.**

What is the smallest number of coins you could use in making change in this transaction?

———Dollars ———Halves ———Quarters
———Dimes ———Nickels ———Pennies

44. If the letters in the word "so" appear in the same order that they do in the alphabet and if the same is true of the letters in the word "by," write the letter Z. But if this is true of only one of these words, write the last letter of that word. ( )

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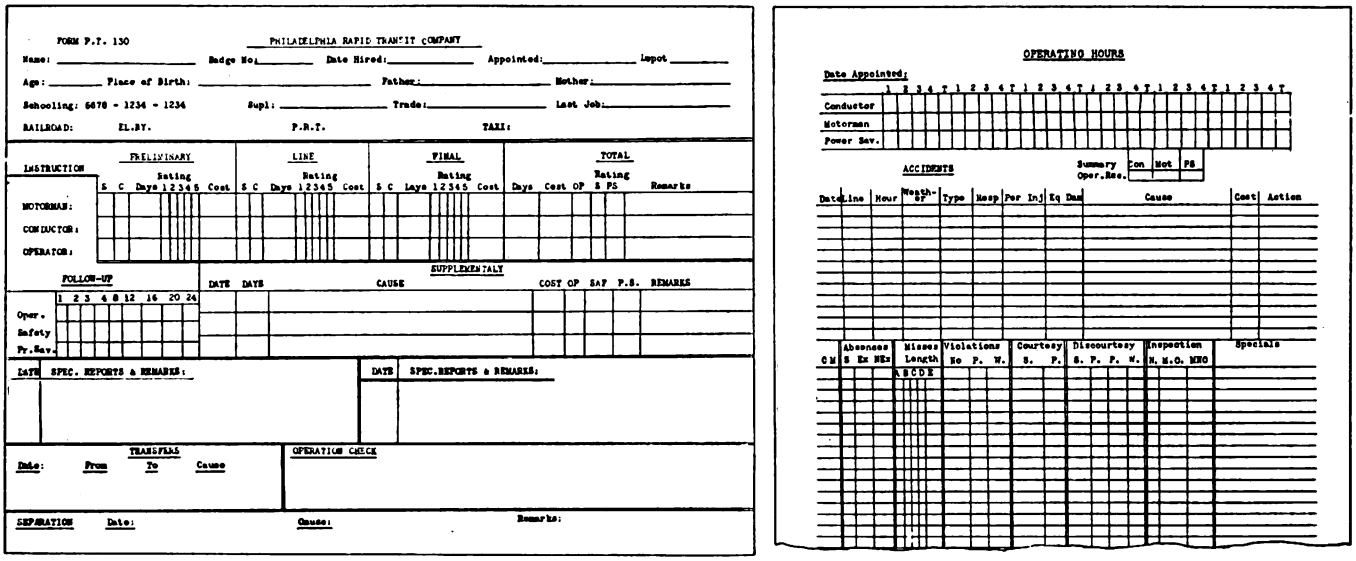

Face and Reverse Side of Form Used by Philadelphia Rapid Transit Company to Record a Student Operator's Record from the Time He Begins His Training and Continuing the Follow-Up Checks for Many Months After He Has Been "Turned In"

measurement of elapsed time between signals and responses.

All that can be expected through the use of these tests is to avoid the selection of men who do not have the inherent or acquired characteristics necessary. On the other hand, if proper men can be selected the thorough training methods will develop these characteristics to the mutual benefit of the company and the men in the reduction of accidents. The psychologists believe this can be done and are developing the equipment and methods necessary. The problem of comparative measurement or scoring that can be used as a basis for the rejection of applicants is as important as it is serious. Great injustice might easily be done through a misuse of methods or a misapplication of basic principles.

More Passengers with Higher Fare

Weekly Pass Helped to Produce Simpler and More Profitable Fare at Mansfield, Ohio—Through Riders Increased 18 per Cent

BY WALTER JACKSON
Fare and Bus Consultant, Mount Vernon, N. Y.

MANSFIELD, OHIO, is a city of 32,000 inhabitants. Automobile ownership and use have increased greatly in recent years, encouraged by the high class of labor employed by the Ohio Brass Company, the home-appliance plant of the Westinghouse Electric & Manufacturing Company, the Mansfield Sheet & Tin Plate Company and other industries.

Electric railway service of excellent quality with one-man cars is supplied by the Mansfield city lines of the Ohio Public Service Company. The equipment is well maintained and intelligently supplied in accordance with the needs of the community.

Nevertheless, patronage had been going downhill since 1920. This may have been due in some measure to increase of fares, but undoubtedly the chief cause was the multiplication of automobiles. One proof of the latter is that although an 8-cent cash fare and a 7½-cent token rate (seven for 50 cents) had been established as early as Feb. 18, 1921, the initial decline was accelerated in following years right up to April 19, 1925, when the City Council approved a new scale as follows:

A cash fare of 10 cents to replace the multi-coin cash fare of 8 cents.

A token fare of 8 cents (five for 40 cents) to replace the 7½-cent token.

A weekly pass at $1 to yield a low rate to persons using the service for more than twelve rush-hour rides a week.

WHY THE PASS SCALE PLEASED THE PUBLIC

In the ordinary unit-fare way of securing more revenue through higher rates, every class of rider is unpleasantly affected. Hence there is more community opposition with the frequent result, in walking-distance towns, that the higher fare proves disappointing to the railway in revenue and injurious to the community's business and social activities in reduction of riding.

A different principle was tried at Mansfield. The cash fare of 10 cents, it was pointed out, need be paid only by casual visitors or those automobilists whose cars were in the repair shop.

On the other hand, the person who would be willing to invest no more than 40 cents for five tokens good any time and for as many as five persons still could ride for 8 cents—the fare hitherto paid by one-half the riders.

Finally, those regular or fairly regular patrons who had been riding for 7½ cents would in the future have the privilege of absolutely unlimited service at a cost of only fourteen 7½-cent rides a week.

From this it is apparent that the increase in cash fare was to be offset by a decrease in the cost of rides taken by regular riders or those to whom they transferred their passes. The semi-regular rider buying 8-cent tokens was hardly touched by the change. That this policy of "divide and conquer" proved a good thing for both the railway and the public will appear from the following paragraphs.

INCREASE IN BOTH REVENUE AND RIDING DESPITE HIGHER AVERAGE FARE

In the pre-pass period of 1925, the Mansfield City lines showed the following revenue losses in comparison to the same months one year previous: January, 12

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per cent; February, 15 per cent; March, 8.5 per cent; April, 7 per cent.

In the pass-using months, May, 1925, showed the same rate of loss as April, but thereafter to the present period every month has shown gains as follows: June, 15 per cent; July, 20 per cent; August, 16 per cent; September, 14 per cent; October, 13 per cent; November, 29 per cent; December, 21 per cent; January, 12 per cent; February, 22 per cent; March, 19 per cent.

With the old fares, the average rate per through ride ranged between 7.4 and 7.7 cents. Under the new scale, the average fare is about 8 cents. In determining the new average fare it is necessary to reduce the recorded pass rides by 20 per cent to allow for rides that would be figured as free transfers for cash and token passengers.

Although the average fare is higher, the number of through passengers has increased. This is accounted for in large degree by the unusually high proportion of passholders who not only take more rides personally but are also a factor in increasing the car rides by members of their families. An analysis of the February figures will be helpful here:

RIDING AND REVENUE RATIOS, MANSFIELD, OHIO, CITY TROLLEY ROUTES

	Before Passes — February, 1925		With Passes — February, 1926	
Revenue ratios	Total	Per Cent	Total	Per Cent
Cash fares (8 vs. 10 cents)	$5,494	46	$6,925	47
Tokens (7½ vs. 8 cents)	6,512	54	3,081	21
Passes at $1	.....	...	4,560	31
School	.....	...	141	1
Totals	$12,006	100	$14,707	100
Riding ratios	Through Rides	Per Cent	Through Rides	Per Cent
Cash fares	68,672	43	69,259	36
Tokens	91,168	57	38,506	20
Passes	.....	...	79,058	42
School	.....	...	2,840	2
Totals	159,840	100	189,663	100

From the figures given in the table are derived an average sale of 1,140 passes a week and only 17.3 through rides per pass per week. The exceptionally high sale of passes for a city of this population and the relatively small number of through rides go together. Most of the pass purchasers do not have time to use it for a luncheon ride, but they buy the pass because it is cheap and still gives them the opportunity to take extra rides at night and on Sundays.

In this particular month, February, 1926, the average fare was only 7.7 cents compared with 7.5 cents in the pre-pass month of February, 1925. In general, however, the pass schedule averages closer to 8 cents. The increase in revenue was 22.5 per cent, while the increase in through rides was 18 per cent.

Although 18 per cent more through riders were handled, the work of the car operators was decidedly less. Thus there were 587 more cash riders, but a simple dime usually took the place of the cumbersome 8 cents. The number of token riders was cut by 52,662, producing another great reduction in change-making. Transfers were cut 30 per cent or more.

Since most passholders are persons who probably spent $1 a week anyway in purchasing the 7½-cent tokens, the increase in revenue must be sought for in two directions: From casuals paying 10 cents instead of 8 cents and from the companion rides included by passholders.

It is worth noting that a rate of five for 40 cents calls for an amount that is beyond the investment desire of a true casual, thus leading him toward the convenient dime. Again, when 1,140 regular riders cease using tokens, it is obvious that they will often pay a dime fare for a companion in preference to making a rather awkward purchase for something they do not need themselves.

Not the least reason for the success of this fare change was the co-operation of the Ohio Brass Company through its house organ, but unquestionably the most important factor was the appreciation by F. A. Chamberlain, district manager, and Walter Goodenough, superintendent, that the pass plan offered a real opportunity to sell rides and increase good will.

Accidents Reduced in California

THREE companies operating in California have reported a reduction in accidents during 1925 compared with the year previous. They are the Pacific Electric Railway, the Los Angeles Railway and the San Francisco Municipal Railway.

The Pacific Electric Railway, Los Angeles, has indicated a reduction of 1,745 accidents of all classes in 1925, equivalent to 16 per cent less than during the preceding year. Analysis of the different classes of accidents shows that vehicular mishaps decreased 14 per cent, step accidents 49.9 per cent, persons struck by cars 34.6 per cent and derailments 31.1 per cent.

The Los Angeles Railway reports a total number of accidents in 1925 of 20,244, against 23,303 in 1924, although car-miles operated in 1925 exceeded those of 1924. Accidents in which street cars and automobiles were in collision were reduced from 8,946 in 1924 to 7,082 in 1925. During the year 343,000,000 passengers were carried, but only 75 sustained what might be termed serious injuries.

The San Francisco Municipal Railway reported 3,101 accidents in 1925, compared with 3,209 in 1924. The item of collisions between cars of the railway showed a decrease of 23 per cent, only 85 being reported in 1925, while 111 occurred during the previous year.

Safety Has Good Year in Rhode Island

ACCIDENTS involving street cars in Rhode Island operated by the United Electric Railways show a decrease in 1925 over the preceding year, notwithstanding the great increase in automobile registration, which advanced 12 per cent.

The following table shows, by groups, the principal accidents with the percentage decrease in 1925 compared with 1924 and 1924 as compared with 1923. In this connection it is interesting to state that the first four months of 1926 show further reductions:

	Per Cent Reduction 1925 Less than 1924	Per Cent Reduction 1924 Less than 1923
All accidents	8.38	26
Claims reduced	17	20.2
Collisions with autos	9.28	19
Collisions with cars	30.02	44.45
Pedestrians injured	28.07	30.2
Fatal accidents	22.02	40

Organized safety was commenced on this property in 1923, and the year 1924 was the first full year that could be compared with previous conditions. For the year 1923 it was found that a most gratifying reduction had been made in all of the more serious classes of accidents, notwithstanding the fact that automobile registration increased 14.7 per cent.

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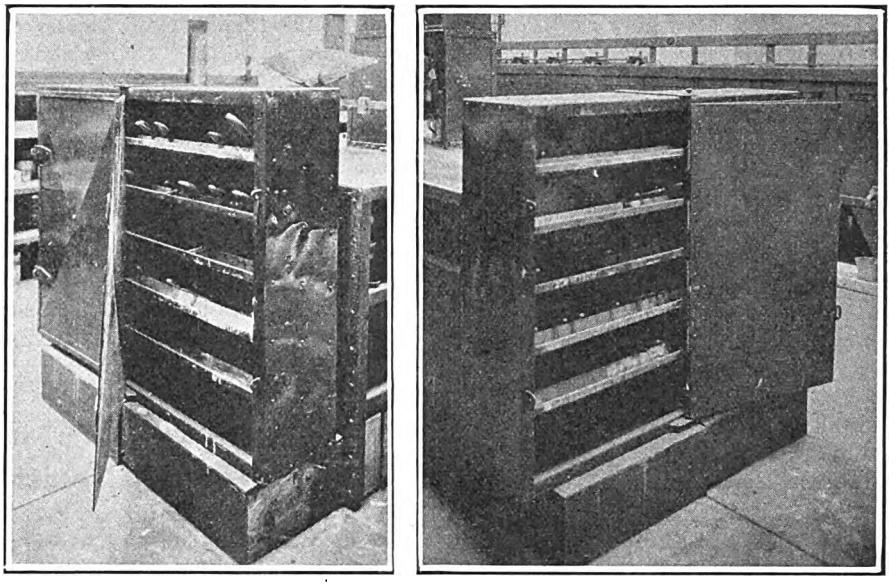
Maintenance Notes

Used Paint Brushes Kept in Good Condition

THROUGH the use of a well-arranged cabinet for keeping paint brushes while they are in use, the Department of Street Railways, Detroit, Mich., has succeeded in prolonging considerably the life of brushes. Whenever a brush is returned from a paint job, it is placed in the sheet iron cabinet shown in the accompanying illustration. This cabinet is 4 ft. x 3 ft. by approximately 15 in. deep and is provided with five shelves.

Access to the cabinet is obtained through two doors, which are hinged at the center and have clasps for locking at either edge. The shelves or pockets for the brushes are pitched toward the back at an angle of about 20 deg. This slanting shelf has two upright divisions running along the front edge. One is directly at the front edge and is 1 in. high, while the second is back about 2 in. and is 2 in. high. This forms a pocket to catch any paint which may drip down as the brushes are wiped clean from drawing them across the upright partition. In addition to these longitudinal uprights, the shelves are also divided horizontally into different sections, so that all brushes which are used in a particular color can be grouped together. The dividing plates keep the colors from mixing.

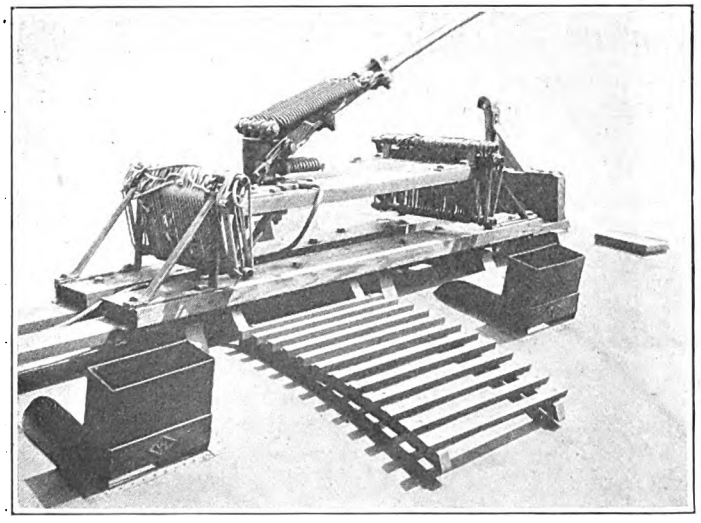


Steel Cabinet Used in the Paint Storage Department of the Department of Street Railways, Detroit, for Keeping Used Paint Brushes

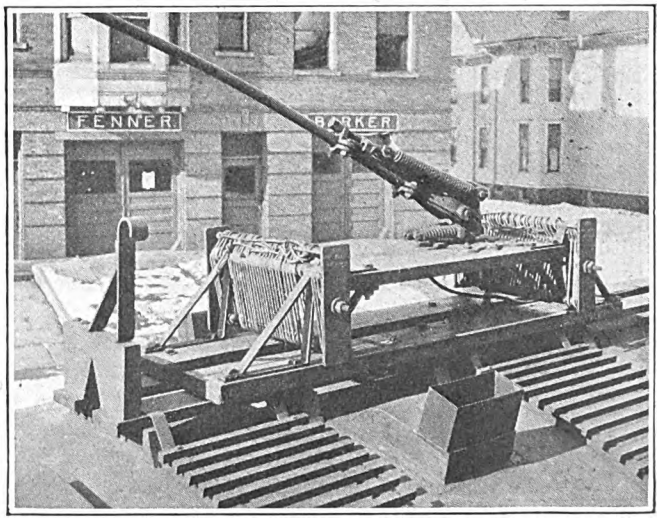
Flexible Trolley Base Suspension Reduces Noise

FOR a means of breaking up the vibration transmitted from the trolley equipment to the car body and also to provide a flexible suspension that will permit the wheel to follow the trolley wire easily, the Buffalo & Erie Railway, Fredonia, N. Y., has equipped one of its interurban cars with the type of trolley base support illustrated. This was originated by Thomas Elliott at the request of the railway officials.

With this suspension, the trolley base is mounted on 2-in. planking, which in turn has a flexible rope support. At the ends of the planking, brackets of ½-in. x 2-in. strap steel are used to hold rods of 1-in. steel tubing. Two similar rods are fastened by steel brackets to the roof boards of the car. At each end of the planking, which supports the trolley base, there are thus three cross-rods; the middle one of the three is fixed to the car roof boards, while the two outside rods are fastened to the trolley base planking. A lacing of impregnated trolley rope binds the rods together and serves as a flexible



Flexible Rope Support Used for Trolley Base on One of the Interurban Cars of the Buffalo & Erie Railway



A Special Fixture Is Used to Hold the Trolley Base Planking in Position During the Lacing Operation

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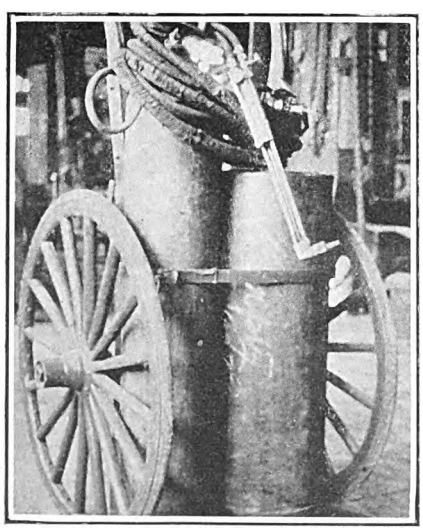
suspension. The rope lacing from the middle rods to the two lower ones serves to support the planking, while the lacing from the middle rods to the two upper ones keeps the planking from rising from its proper position.

The top of the planking on which the trolley base is mounted is about 12 in. above the roof boards of the car. The lower rods are 9¾ in. below the fixed rod and the upper rods 2 in. above the fixed rod. With this method of support, the trolley base is held quite rigid and still a small degree of flexibility is provided. The rope lacing serves to break up any vibrations which would be transmitted from the trolley equipment to the car and so reduces noise in operation.

To provide a support for the planking during installation and also to insure that it is located accurately, a special fixture is used. This is shown in one of the accompanying illustrations. It consists of upright plates, held together by rods. The upright plates are fastened to the roof boards of the car at the bottom, while the central portion supports the trolley base planking. With the boards held in position by this fixture, the rope lacing is applied, and after this is completed, the fixture is removed.

Large-Wheeled Acetylene Welding Truck

EASE of manipulation is particularly desirable in connection with welding equipment. The Grand Rapids Railway, Grand Rapids, Mich., has found that the use of large diameter wheels in connection with a mounting for the tanks and equipment required for acetylene gas welding makes the equipment easy to push. An accompanying illustration shows one of the welding trucks which has solid rubber tired wheels of 36 in. diameter. The framework for supporting the tanks is constructed of 2½x2½x⅜-in. steel angles. A 1¼-in. strap fastens the tanks to the framework. This strap has a hasp and pin connection, so that the tanks can be readily removed and replaced as desired. The truck is provided with wooden handles, which have also been found desirable for use in cold weather, as cold metal is disagreeable to handle. The rubber tires remove jars from the gages and welding attachments so that in operating over rough floors or tracks these do not get out of adjustment.



Large-Wheeled Acetylene Welding Truck as Used in the Shops of the Grand Rapids Railway

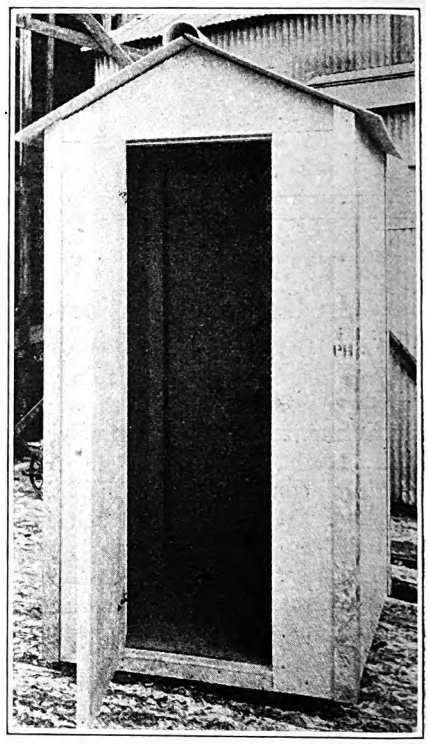
Hose Serves as Buffer at Edge of Dipping Tank

DAMAGE to armatures by coming in contact with the edge of the tank while they are being dipped is prevented by a simple method used in the shops of the Erie Railways, Erie, Pa. This is to attach a rubber hose around the edge of the tank. In this case some sections of discarded hose about 2 in. in diameter are used. These are cut lengthwise so as to fit over the edge of the metal tanks. When once in position, the tendency of the rubber hose to close keeps it tightly in position.

New Equipment Available

Asbestos Lumber Dispatching Booths

BOOTHS of asbestos for use in telephone train dispatching on electric railway lines are now being manufactured by the Asbestos Buildings Company, Philadelphia, Pa. These booths are made from Ambler asbestos lumber, which is manufactured from long fiber Canadian asbestos and Portland cement, built up in sheets and consolidated under tremendous hydraulic pressure. The asbestos lumber has set-in patent galvanized brass pin hinges, bolted on, and a galvanized safety hinge clasp is provided for the padlock. The floor is of tongue and groove pine. The booths are shipped in knockdown form and can be erected by ordinary labor, without the need of the erection crew and engine which are necessary when concrete booths are constructed along the right-of-way. The asbestos lumber from which the booths are made is fireproof and cannot rot or deteriorate from exposure to the weather. No paint is required and there is nothing to need repairs, as asbestos lumber becomes harder and stronger with age.



Telephone Booth of Asbestos Lumber with Galvanized Fittings

Push-Button Motor Control Developed

BUILT for across-the-line starting of slow speed motors and for reduced voltage starting of higher speed motors, a completely self-contained oil-immersed automatic starter for 2,300-volt synchronous motors has been developed by the Electric Controller & Manufacturing Company, Cleveland, Ohio. To start a motor, the operator pushes a button, and as the motor approaches synchronous speed the field excitation is automatically applied.

The reduced voltage starter consists of an automatic double-throw switching mechanism, a power transformer, potential transformer and the current limit transition relay, all contained in a tank of welded boiler plate. On the outside of the tank there is a dust-proof steel cabinet, which incloses the field switching mechanism, field discharge resistor, timing relay and d.c. field ammeter.

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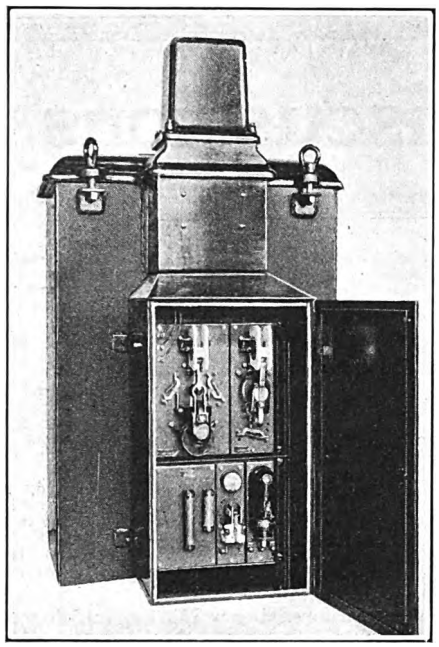


Self-Contained Oil-Immersed Automatic Starter for Synchronous Motors

This cabinet may also contain an automatic starter for operating a magnetic clutch. The full voltage starter is of similar construction except that the starting auto transformers are omitted. This equipment is complete in a single unit.

Safety Zone Markers

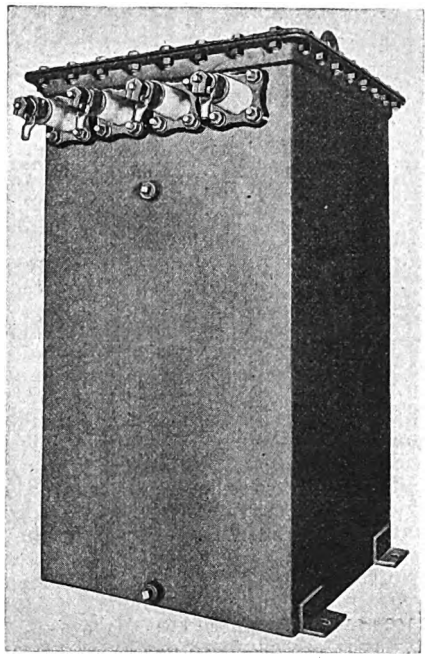
OF A TYPE particularly suitable for street car safety zone markings as well as other forms of traffic regulations, Graf-Barton traffic signals have been placed in service in a number of cities throughout the United States. Several types of these signals are available, the two pictured in the accompanying illustration being especially recommended by the makers for safety zone application.

The signals consist of corrugated or smooth traffic buttons in which sensitive reflecting lenses have been placed, making them plainly visible at all times. As a point in their favor the manufacturers state that the signals are not electric and, therefore, are not subject to the ills of electric systems generally. Each signal is cast in one piece from alloy metal of considerable strength and is mushroom in shape, thus giving the least obstruction to traffic. The various types of Graf-Barton signals are uniform in their general dimensions, being 5 in. high and with a diameter of 15 in. The standard weight is 40 lb. per signal, and approximately fifteen minutes each for installation is required. Four 3 to 4-in. pins are inserted in the paving, while one hole in the top of the signal dome is provided for an anchor bolt for installation purposes.

The city of San Francisco, Cal., has recently purchased 500 of the corrugated types of signals and Los Angeles, Cal., is at present using a like number. Smooth type signals are in use in Birmingham, Ala., and Memphis, Tenn., and in some cases the slow signals have been utilized for street car safety zone purposes as well. Smaller numbers of signals have been installed in other cities and sample orders are being demonstrated in various sections of the country.

At night the reflecting lenses give a brilliant automatic signal. The lens used has been developed after more than a year of research and experimental work in co-operation with various lens factories both in this country and abroad. The reflecting is accomplished by means of a special process of molding the glass, so there is no gilt or mirror backing to peel off or to deteriorate from dampness and other weather conditions.

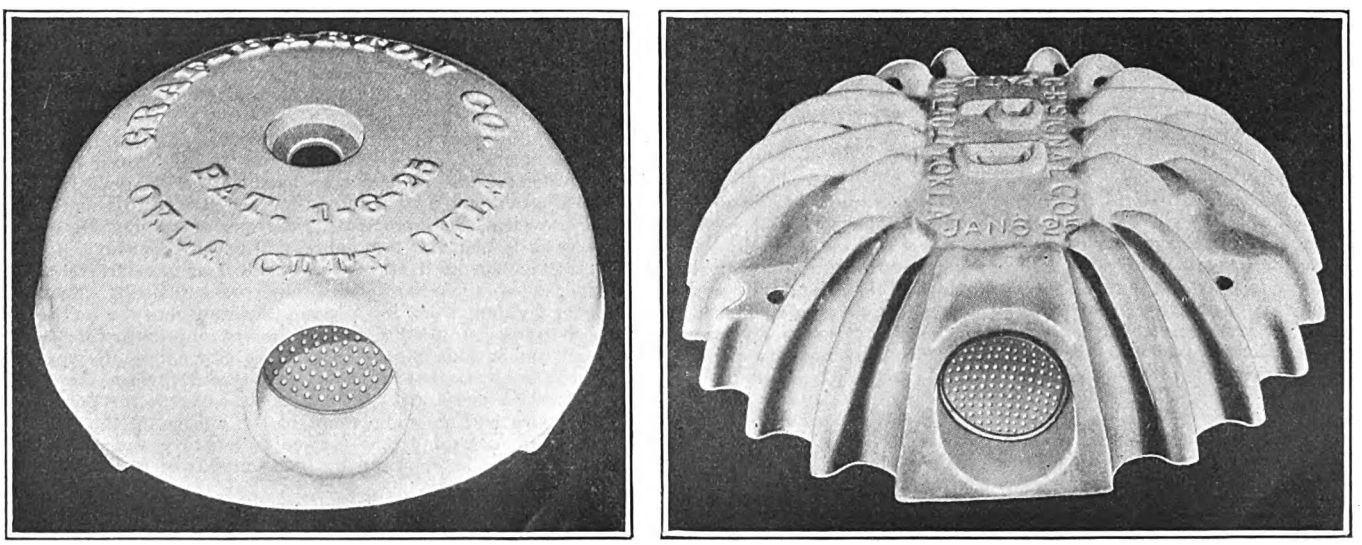
Welded Steel Tank for Transformer



A Transformer of Oil-Tight Construction Is Inclosed in a Sheet Metal Tank

HEAVY end frame construction and a welded sheet metal tank are outstanding features of a new shovel type transformer just designed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Additional bracing is used to prevent the transformer from sliding around inside the tank. This type of transformer is intended for applications where fine dust finds its way into the ordinary transformer and causes clogging of ventilating ducts. These new transformers are manufactured at present at 2,300 volts, single phase, 60 cycles, but it is also possible to obtain them in other voltages.



Plain and Corrugated Types of Graf-Barton Traffic Signals for Safety Zone Use

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Association News & Discussions

Wisconsin's Experience with the Indeterminate Permit*

By Lewis E. Gettle
Chairman Railroad Commission of Wisconsin

THE Legislature, the commission and the courts have universally agreed in Wisconsin that the very essence and foundation of a complete system of centralized regulation is the indeterminate permit complemented by provisions for municipal acquisition and for monopoly of operation. It is recognized that attempts to provide rates that will adequately take care of amortization in the cases of term franchises have universally failed. The public had no assurance of continued, progressive service, and capital necessarily was timid in the face of uncertainties and hostile contingencies. The new form of permit was an effort toward standardization, permanence and a large measure of security whereby the consumer, the investor and the utility would mutually profit.

The outstanding difference between the new grant and the old is that the monopoly feature of the new can be changed at any time by the commission through the issuance of a permit to a competing utility. Revocation is perhaps purely a function of the Legislature or a court, but the commission is vested with almost as effective an equivalent. Competition in the utility field is futile, wasteful, exasperating to municipal authorities in constantly creating conditions of unsightly and unsafe construction, and uneconomic as viewed from any standpoint. "Monopoly" from ancient time was and still is to many people highly offensive. The Supreme Court of Wisconsin has clarified the significance of its application to utility service in terms that divest it of all semblance of malevolence and clothe it with positive beneficence. In Calumet Service Co. vs. Chilton, 148 Wis. 334, the court says:

> We should say, in passing, that the term "monopoly" as thus used is to be taken in the sense of a mere exclusive privilege granted for a consideration equivalent; monopoly only in the sense that the field of activity is reserved to the grantee—the mere element of exclusiveness. A privilege of that sort, where there is a consideration equivalent to the public, though often spoken of as a "monopoly" is essentially different from one of the character regarded as odious at common law and prohibited in many state constitutions. . . .
>
> So while, in common parlance, it is proper to characterize the exclusive privilege in question, a monopoly, it is one purchased by giving an equivalent to the public, as in case of a patent allowed by the federal government. It is a grant for a public, not for a private, purpose, and not a grant of that which without it would be of common right. It has none of the essentials of the monopoly so offensive, anciently, in the eye of the law.
>
> While perhaps the term exclusive privilege is the better term to apply to the right in question, the world "monopoly" has been used in the books with reference to such franchises.

The increasing public demand for utility service is stupendous. In Wisconsin the demand for capital additions to public utilities, exclusive of railroads and other utilities classed as such, has required $50,000,000 annually in recent years. The rural communities are actually clamoring for coveted electric service. The companies are just beginning to study and to meet these rural demands. When a utility must market its bonds at 75 and pay a high rate of interest it must amortize the bond discount and get the money to pay the interest out of consumers during the life of the bond. The form of franchise has a direct bearing on and relation to the economy of financing.

I have been accorded the liberty of

*Abstract of a paper presented before the Missouri Association of Public Utilities, May 3, 4, 5, 1926.

SUMMARY *of Mr. Gettle's Views as Expressed in a Report Prepared by Him as Chairman of a Special Committee on Uniformity of Legislation of the National Association of Railroad and Utilities Commissioners at Phoenix, Ariz., in November, 1924.*

THE fixed-term franchise is the product of a bargain arrived at between the municipality and the public utility promoter, at best with each of these striving for the best bargain available from his own standpoint and each subject to the human limitation of being unable to forecast the future with certainty as to just what changes in the conditions of performing public service will be brought about by the development of the public utility, new improvements, new inventions affecting the service and its cost, the growth in population of the municipality, etc.; at worst such a bargain has, by reason of either the faithlessness or the inefficiency of public officials, resulted in a subordination of the rights of the city and the public to the private interests created by the franchise. At all events a fixing of rights and duties of the utility by such bargaining has proved a hopelessly inadequate method of dealing with a very simple situation.

The franchise in theory has but one purpose and in practice it should be made for that single purpose. It is the grant of a right to use the public streets and highways in the interest and service of the public, and in the last analysis it is only the interest of the public which should be considered in determining its provisions. It is granted not for the purpose of enabling private persons to carry on a private business, but for the purpose of securing adequate public service at reasonable rates of charge therefor. Private interests, whether they be those of the public utility owner, or those of the investor in public utility securities, are created merely as a means to that end.

For the purpose of securing such public utility service as is desired, of course private capital and initiative must be attracted to the enterprise, and to determine whether it would be attracted by allowing the opportunity of earning a liberal return upon the investment, or whether it be attracted by reducing the risks to a minimum, and decreasing the amount of the return in proportion, the interests of the public must be consulted. And since the state has the power and the means of reducing the risks of the public utility business to a minimum, and in turn attracting into public utility investments capital at a correspondingly cheaper rate, and since the state may thereby reduce the cost of public utility service to the consumer, and extend the opportunities of securing it to a wider portion of the public, the public interests demand that such means and such power be employed.

This is the direct purpose and the direct effect of the indeterminate permit. The interests of the public emphatically do not warrant hanging over the head of the public utility the warning contained in the fixed-term franchise that at the end of the term the municipality, for any or for no reason, may see fit to deprive the public utility of the use of its equipment except as it may be removed from the streets or disposed of at such market as may present itself. Such treatment amounts to an injection by the state into the public utility business of a wholly unnecessary and unjustifiable risk, and can be indulged in only at the expense of discouraging capital investments in public utility enterprises, thereby resulting in necessarily higher rates of charge for public utility service and an impairment of the ability on the part of companies furnishing that service to improve and extend the same as may be required by the demands of public convenience and necessity.

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quoting from communications received within a week from banking houses on this subject.

I quote from "Time and Money," by H. V. Bozell of Bonbright & Company, New York, being a statement made Dec. 4, 1925, to the Illinois legislative committee investigating the indeterminate permit:

> There is no doubt that the life of the franchise has a very direct bearing upon not only the cost of financing but also the question as to whether sound financing is possible. . . .
>
> . . . The indeterminate life of a terminable permit, together with the provisions for public acquisition or other guarantee in case of termination, allows long term and consequently cheaper financing—cheaper both in actual price and in the saving due to the absence of necessity of refinancing frequently. It also has a tendency to keep the investment banker "on the job," so to speak, to keep in contact with the company, to be assured that it is constantly giving satisfactory service so that there will be no probability of the termination of its franchise with a consequent weakening of the position of the securities which he has marketed.
>
> . . . That such an argument is not merely hypothetical is graphically portrayed in an instance which came to my attention just two or three years ago. One of the largest, most conservative and most astute investing institutions in America was considering the purchase of a large block of bonds of a company in Oklahoma. The purchase was decided against on account of the franchise situation there. Subsequently, Oklahoma passed her indeterminate franchise law, and on account of that and that alone this large institution decided to purchase the very block of bonds which had previously been decided against.

In the early history of the indeterminate permit private utilities apparently were apprehensive that the public would abuse or use recklessly the new power to buy utilities through easily usable methods and at trifling procedure expense and that such power might be employed to harass companies which did not enjoy pleasing and satisfactory public relations. But the commission early took the position that only where satisfactory service at reasonable rates was utterly impossible or where a utility persistently disobeyed or flouted the orders of the commission would it exercise its power to authorize a competing utility. This position has been maintained consistently even as to cities which desired to do their own lighting for the reason that it was practically shown that the existing utility could perform the service more cheaply and better if the commission's orders were complied with. I recall only one case where a certificate of convenience and necessity was issued to a competing company. This was where a miller incidentally had some surplus water power which he used to furnish current during the summer months to cottagers around a small lake but could not very well increase his power sufficiently to reasonably serve the town for which he had an indeterminate permit. A competing company could give 24-hour service at about one-half of the miller's charges and the company was granted an indeterminate permit.

Under present laws, there is no sale of a franchise by bid or otherwise, and no payment of percentage of gross earnings into the municipal treasury. The franchise has no monetary or property value either for rate-making or purchase purposes, yet it is of such character that the privilege may be defended and protected from invasion or usurpation by every arm of the courts in law or equity. Very occasionally the ghosts of the old provisions arise and assert themselves in rate and purchase cases. The commission, justly we think, allows claims made for franchise purchase costs, but only to the extent that the cash was actually and honestly paid.

Every member of the Railroad Commission since its inception has strongly favored the indeterminate permit form franchise. Halford Erickson, former commissioner, then and now an eminent utility economist, presented a discussion on this subject in 1914, which is an exceedingly valuable early contribution. I quote his concluding observation:

> When everything has been said, however, the fact remains that the indeterminate permit as a form of franchise affords more protection to both the public and the utilities than any of the various kinds of franchises by which it was preceded.

John H. Roemer, former chairman, in his address before the Southern Gas convention at Mobile, Ala., April 3, 1908, vigorously supported the new form of permit but stressed the prerequisite for its successful administration a skilled, judicially minded personnel on the commissions.

Carl D. Jackson, former chairman of the Wisconsin Commission and president of the National Association of Railroad and Utilities Commissioners, in his annual address as such president, at Detroit, Mich., on Nov. 14, 1922, said:

> A limited term franchise is notice that at some future date the municipality or state may see fit to treat the utility property and legitimate investment in public utilities on the junk value basis. Such possibility discourages incentive, improvements, extensions and good service and at the same time increases the cost of all financing.

The Wisconsin Supreme Court has not only established the indeterminate permit in legal security but has added its commendation of the social and economic aspects.

In La Crosse vs. La Crosse G. & E. Co., 145 Wis. 408, the court said:

> The aim of the Wisconsin indeterminate law was to displace existing public utility franchises by new, direct grants from the state of a uniform character free from the peculiarities of old franchises prejudicial to the dominant end in view; the best service practicable at reasonable cost to consumers in all cases and as near a uniform rate for service as varying circumstances and conditions would permit; a condition as nearly ideal probably as could be attained. . . . That such a complicated situation has been met by written law in such a way as to avoid successful attack up to this time on the validity of the law or any part of it, and avoid attack at all, either upon the law or its administration, except in a few instances, and secure optional submission by many owners of old franchises to the displacement of the privileges—is quite a marvel; reflecting credit upon the lawmaking power and the body charged with the onerous duty of administering the statute.

The public utilities of the state seem to be a unit in approval of the law. There is some dissatisfaction and restiveness regarding the valuation methods of the commission, the utilities claiming that the commission undervalues and the public resisting advances in valuations. While the commission's functions and powers have quite often been attacked by bills in the legislature, the tendency has been strongly toward strengthening the utility laws. There has been no retrogression in any essential regard.

The Socialist party, rather dominant in Milwaukee and unwaveringly hostile to all commission regulation, frankly hails any weakness or alleged failure of the law or its administration with satisfaction because it thinks it may hasten universal public ownership—its ultimate goal. Even the Socialists have little or no criticism of the indeterminate permit, but they want the city authorities to administer it.

I cannot summarize my views more clearly than I expressed them in my report as chairman of the special committee on uniformity of legislation of the National Association of Railroad and Utilities Commissioners at Phoenix, Ariz., in November, 1924. I may say most of my colleagues refused to join in my proposed report and the convention refused to approve it because it was thought to be too sharply out of accord with the fixed faith in the term franchise employed in the home states.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 9-16*—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.**

***June 10-11*—Advisory Council conference electric railway executives, Eastern region, starting 3 p.m. June 10, Engineering Societies Building, 29 West 39th Street, New York City.**

***June 21-25*—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.**

***June 25-26*—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

***June 28-July 2*—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.**

***July 8-10*—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.**

***August 12-13*—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.**

***Oct. 4-8*—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.**

Attractive Program Arranged for Bluff Point

BLUFF POINT, on Lake Champlain, N. Y., is such a beautiful spot that it is hard to imagine a convention there without an entertainment program which will suit everybody. Such a program has been arranged for those who expect to attend the 44th annual convention of the New York Electric Railway Association, to be held there on June 25-26.

On account of the fine links at Bluff Point, golf will be the principal form of outdoor sport, and a tournament will be held on Saturday, June 26. There

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will also be a ladies' putting contest.

While many will probably drive by automobile to Bluff Point, special Pullman accommodations, consisting of two compartment cars and three 12-section-drawing room cars will be attached to the New York Central train No. 31, leaving New York at 8 p.m. Eastern standard time on the night of June 24. These cars will be set out on the private siding at Bluff Point, on their arrival there, so it will not be necessary for passengers to leave the train. One of the standard sleeping cars will return to New York Saturday night. The other cars will leave Sunday night. C. H. Beck, Westinghouse Traction Brake Company, 150 Broadway, New York, has charge of the Pullman and transportation arrangements.

Engineers Debate Parking Restriction

Better Use of Existing Streets Rather than Creation of New Ones Is Proposed to Relieve Traffic Congestion—Common-Carrier Vehicles Can Be Used Advantageously to Replace Private Automobiles

INCREASING the efficiency of passenger transportation in city streets by making the entire roadway available for moving vehicles was the subject of lively discussion at a meeting of the American Society of Civil Engineers held at New York June 2. Representatives of the electric railways, the Regional Plan of New York and Its Environs, the police department and various other agencies contributed their views. Better use of existing streets rather than construction of new streets was held to be the most practical method of relieving traffic congestion.

A paper dealing with parking regulation and its effect on city transportation was presented by John A. Miller, Jr., associate editor ELECTRIC RAILWAY JOURNAL. Use of the public streets for the storage of private automobiles is tolerated, he said, only because of an exaggerated idea of their importance in the general transportation plan. Traffic counts in several large cities show that public transportation vehicles are carrying upward of 75 per cent of the total traffic, although they constitute only about 15 per cent of the total number of vehicles. Retail trade suffers greater loss now on account of traffic congestion than would be occasioned by the elimination of parking.

Most wasteful of all vehicles used in passenger transportation is the taxicab. Investigations made at various locations in New York City indicate that the average load is less than one passenger. Approximately half the taxicabs were cruising without passengers. He suggested reduction or elimination of parking and substitution of buses in many instances in place of private automobiles and taxicabs. An abstract of this paper was published in ELECTRIC RAILWAY JOURNAL, May 8.

Discussing this paper, Harold M. Lewis, executive engineer Regional Plan of New York and Its Environs, gave figures showing the relation between speed and the number of vehicles per lane per hour, as determined from traffic surveys made in New York City. Charles Rufus Harte, president American Electric Railway Engineering Association, said that the value of the parking privilege from the viewpoint of the retail merchant depends not so much upon the actual curb length available in front of the store as it does upon the distance from the store to the center of gravity of the entire parking area. In his opinion the time is not yet ripe for any real solution of the parking problem. He believes that the situation will work itself out to a considerable extent. Electric railway traffic in the last year or two has been materially increased because of the difficulties and dangers of driving automobiles in congested districts. Development of electric railway service to such a point of convenience and attractiveness that a still larger number of people will prefer it to the use of private automobiles or taxicabs was mentioned in his talk as one possible way by which relief might be obtained.

As an intermediate step between the present lack of street parking regulation and the type of regulation which might be considered as ideal, W. E. Thompson, vice-president Third Avenue Railway system, suggested the elimination of parking during rush hours only on one side of important streets. He called attention to the results of an investigation made by the Department of Commerce showing that retail merchants all over the country are beginning to realize that congestion is hampering their business. Lieut. William A. Loehman of the Traffic Division of the New York Police Department expressed himself as favorable to a plan to eliminate parking on one side of important streets during rush hours. He admitted that the parking situation is a serious problem and mentioned the difficulty of enforcing the limited time parking regulation, but said that he thought that total elimination of all parking in the congested district was too drastic a step to be taken at this time.

CONGESTION IS CAUSING DECENTRALIZATION

W. G. Strait, vice-president New York Railways, spoke of the work of the Manhattan surface line operators' traffic committee. "We believe that parking ought to be confined to one side of one-way streets and that it ought to be prohibited on thoroughfares south of 65th Street where street cars and permanently established bus lines operate," he said. "The merchants, or some of them, are the principal champions of parking. They are so solicitous of the luxurious comfort of the lady who drives up to their stores in a private sedan that they inadvertently are doing their utmost to make their stores, and, in fact, the entire midtown section, inaccessible to the thousands of her sisters who travel by foot and public conveyance. Their attitude, if continued, will result sooner or later in causing a general decentralization of retail business." An abstract of the report of this committee is published in the news pages of this week's issue of the JOURNAL.

Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, said that the subject of increasing the efficiency of passenger transportation in city streets was a broad community subject and that progress toward the solution of the problem would not be made until all those affected stop seeking their own selfish advantage and consider the problem in the light of what would be best for the community as a whole. He cited the opposition of merchants to parking restrictions and skip-stop car operation as examples of this feeling.

Elimination of traffic bottle-necks was held to be even more important than restriction of parking by Louis Deblois, National Bureau of Casualty and Surety Underwriters. He expressed some doubt about the amount of extra space that would be obtained for moving traffic by forbidding vehicles to stand along the curb for long periods. This was answered by Mr. Miller with figures showing that parked automobiles in some cases take up as much as two-thirds of the effective roadway, and that instances of such use of one-quarter to one-half of the available space were common.

H. H. Dunn, the Beeler Organization, New York City, spoke briefly concerning investigations showing the means of transportation used by Westchester residents in reaching New York City. Other speakers included E. N. Johnston of the American Gas Accumulator Company; Max Miller, contractor, and E. K. Thompson, consulting engineer.

C.E.R.A. Delegates May Return Home by Boat

A ROUND TRIP by water can be made by delegates attending the Central Electric Railway Association convention. Arrangements for the return trip have just been made by the committee in charge. The return voyage will be on the same boat. Just 24 hours layover will be allowed in Chicago and delegates making the return trip will be permitted the use of these accommodations, although no meals will be served while in port at Chicago.

The convention trip will be officially over upon arrival at Chicago, Friday afternoon, July 2. The *S. S. South American* will lie at the dock until 4 4 p.m. Saturday, July 3. For those who have not made reservations the rate will be $85 from Buffalo to Chicago and return, $76 from Cleveland and return and $72 from Detroit and return, including meals and stateroom accommodations. If reservations have been made, the return accommodation can be had for the difference between these rates and the convention one-way rates.

New York Railroad Club Outing

THE New York Railroad Club has changed the date of its midsummer outing from July 15 to July 8. A number of new "stunts" are promised for this meeting by the committee on entertainment.

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California Electric Railway Men Hold Semi-Annual Meetings

MEETINGS of the superintendents, engineering, purchasing and stores, accounting, and public relations committees of the California Electric Railway Association were held in San Francisco May 20-22, 1926. The discussions centered on public relations, present-day bus operation, storekeeping methods, and overhead construction. The matter of radio interference by electric railways was discussed at some length, and a committee was appointed to make investigations, conduct tests and report findings and recommendations to the members.

American Association News

Manufacturers' Executive Committee Organized

L. S. STORRS, managing director of the American Electric Railway Association, has just announced the organization of the committee of manufacturers' executives to direct activity leading to the improvement of electric railway cars. Organization of such a committee was decided at a general meeting of car and equipment manufacturers held in New York last fall. This, in turn, was the outgrowth of the meetings of manufacturers arranged during the convention last fall at Atlantic City by Mr. Storrs and by ELECTRIC RAILWAY JOURNAL.

Members appointed on this committee are as follows: M. B. Lambert, Westinghouse Electric & Manufacturing Company; E. P. Waller, General Electric Company; T. W. Casey, National Pneumatic Company; George Frey, J. G. Brill Company, and E. C. Faber of the Barron G. Collier organization. A meeting of the committee is planned for the near future. One of the first subjects to come before it will be action on the report made by the special committee of manufacturers' engineers, which was also appointed at the New York meeting, to undertake a study of car design looking toward reduction in the number of sizes and types of bodies and equipment demanded by the electric railway industry. The work of this committee has been completed and its report turned over to Mr. Storrs pending organization of the manufacturers' executive committee, which has now been appointed.

Equipment

THE final meeting of this year's equipment committee was held at the American Electric Railway Association headquarters, New York City, on June 3 and 4. Those present were: Pierre V. C. See, chairman; Daniel Durie, sponsor; Clarence W. Squier, secretary; Walter S. Adams, W. W. Brown, R. S. Bull, A. L. Broe, A. T. Clark, R. W. Cost, M. R. Hanna, J. M. Hipple, Joseph C. McCune, J. S. McWhirter, E. S. Sawtelle and H. S. Williams.

In connection with Subject No. 1, which included a review of existing standards and specifications, it was decided to include two new designs of air-brake shoes for the American Railway Association's wheel contours in the Manual. In addition to these shoes, necessary standard head, key, brakehead gages and brakeshoe gages are to be included.

Some corrections and changes have been decided upon in connection with standard designs of journal bearings. In making these changes, it was decided to have a single drawing for all journal bearings and to provide a table of dimensions for each bearing. The drawing was submitted and the table of dimensions was approved by the committee.

Recommendations of the Central Electric Railway Master Mechanics Association, relating to dimensions for height of platforms and bumpers for interurban cars, automatic couplers and specifications for end connections were considered. Some of the changes recommended by the C.E.R.A. were thought to require further investigation and the committee decided to continue this subject for another year.

Specifications for gears and pinions were discussed at considerable length and it was decided to include tooth forms for the long and short addendum spur and helical shapes in the specifications. Distinguishing marks for different tooth shapes of spur and helical gears were also decided upon, together with a table giving different rim thicknesses for different pitch gears.

In connection with Subject No. 2, which included air brakes and air-brake rigging, specifications for certain parts under existing miscellaneous methods and practice were decided upon and will be recommended for standard. A new miscellaneous method and practice entitled "Air Brake Equipment—Inspection of Brakes," was also approved.

In considering the subject of car painting, a very complete report was presented by Mr. Bull. This was approved and will be included in the final report.

An inspection schedule for buses was also approved and will be recommended for inclusion in the Manual as a recommended practice. To provide a limit at which gearing should be removed, gages have been developed by Committee No. 5. These gages permit operators to determined easily when the gearing has reached its useful life.

In connection with the boiler code adopted by the American Society of Mechanical Engineers, and which the sub-committee of the equipment committee has been following, it was reported that agreement had been reached to include 16-in. diameter reservoirs in the classification of those with ⅜-in. wall.

Specifications for wool waste were presented and approved by the committee and will be submitted as a recommended specification. A report on motor leads and supports was also accepted.

In connection with the study of cars and car equipment with the idea of improving the appearance and convenience to passengers, lighting tests and demonstrations of lighting effects were made by various manufacturers' representatives at the De Kalb Avenue shops of the Brooklyn-Manhattan Rapid Transit Corporation on Thursday night. This study is being made in order that the committee can recommend certain fundamentals that appear desirable to be included in general specifications for cars in regard to lighting equipment.

Space Application Blanks for Convention Sent Out

DIAGRAMS showing the booth layout, together with application for space at the convention to be held at Cleveland, Oct. 4 to 8, inclusive, were sent out June 1 via registered mail by the exhibit committee of the American Electric Railway Association. As in previous years, a 30-day time limit has been set for the return of applications. All space requests received at association headquarters up to the close of business June 30 will be awarded space by the exhibit committee, which is scheduled to meet the early part of July to make the official space assignment. Applications received after June 30 will be assigned space in the order of their receipt by the director of exhibits.

Ample space has been provided for all classes of display. The plans contemplate the full use of both floors of the Cleveland Public Auditorium. In addition, a steel structure, to be known as the Auditorium's West Wing, with an ornamental stucco façade, and planned to conform to the architectural lines of the auditorium, will be erected immediately adjacent to the auditorium. In all, there will be available 111,902 sq.ft. of space in both buildings, distributed over 312 booths. Last year at Atlantic City it was possible to provide only 100,000 sq.ft. of space.

In the auditorium proper there are 156 booths of varying sizes, containing, in all, 43,465 sq.ft. of space. In the Auditorium's West Wing there are 148 booths, covering in all 62,077 sq.ft. In addition there are eight large booths outdoors for operating exhibits of steam shovels, caterpillar cranes, earth borers, tie tampers, welders and other maintenance of way operating exhibits, as well as 1,500 lineal feet of track space for the display of street, rapid transit, interurban, gas-electric, gasoline, crane, dump and other car exhibits. The track space has been divided off into 10-ft. units, in order to accommodate equipment of varying lengths. Should space requests be such as to make it advisable to provide for additional square footage, it will be necessary only to lengthen the Auditorium's West Wing. There is ample city property immediately adjacent which has been placed at the disposal of the association for such use.

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The News of the Industry

Mayor Vetoes Richmond Franchise

Mayor Bright of Richmond, Va., vetoed the blanket franchise for the operation of the Virginia Electric & Power Company. The Common Council has been called in special session by President Fred H. Powers to act on the veto, and the general consensus of opinion is that both the Council and the Board of Aldermen will over-ride the Mayor's veto.

The Mayor states in his veto message that he approves the ordinance in every particular save that referring to tax on gross revenue. He declares that the proposed reduction will mean the loss of approximately $70,000 a year in revenue to the city, and suggests that the Virginia Electric & Power Company should be required to pay its proportion of the expenses of increased outlay in the conduct of a growing city. The Mayor says it is manifestly unfair to reduce the tax against the traction company without making a move toward similar reductions in taxes for other corporations.

The existing rate of tax paid by the traction company on its gross revenue is 6¼ per cent. The company argued for a tax of 3 per cent. The 5 per cent tax is a compromise. The proposed tax it to be graduated downward for a period of ten years until it is 3 per cent, at which it is to remain for twenty years, the life of the proposed blanket franchise being 30 years.

Mariemonters Prefer Electric Railway Service

Definite plans for the operation of the Cincinnati, Milford & Blanchester Traction Company by the Cincinnati Street Railway, Cincinnati, Ohio, will be worked out as soon as Edgar Dow Gilman, city railway director, has acted on the request of the railway to purchase the traction line, which operates between Cincinnati and Milford. Meanwhile, at a conference of officials of the railway with residents of Mariemont, the suburb served principally by the Cincinnati, Milford & Blanchester Traction Company, patrons expressed the opinion that they favored electric railway transportation over bus service because the railway was more dependable. Under the plan as outlined by Walter Draper, president, the Cincinnati Street Railway would buy the tracks, poles and wire for $49,000 and would lease the rolling stock and buy the power.

The Cincinnati, Milford & Blanchester line recently was sold by the Kroger interests to a Toledo syndicate headed by L. G. Van Ness, formerly president of the Cincinnati, Lawrenceburg & Aurora Street Railroad, and now in charge of operations of the Cincinnati, Georgetown & Portsmouth Electric Railroad.

In a letter to the director of public utilities Mr. Draper explained that the Cincinnati, Milford & Blanchester traction line had operated years ago to Blanchester, but that portions of the line had been abandoned, until at present it embodies 11 miles of track in all and a carhouse at the terminus in Madisonville at Erie Avenue and the Pennsylvania Railroad crossing. Mr. Draper said the traction line now operated three modern cars on a half-hour schedule and was owned by the Cincinnati Suburban Power Company. If the street railway bought the tracks, poles and wire, the power would be bought from the Suburban company, while the rolling stock would be leased from the Cincinnati, Milford & Blanchester Traction Company.

Mr. Draper expressed the opinion that the road could be made to pay. He said that his company had been urged by residents along the route to take over the operation of the system. The Cincinnati, Milford & Blanchester Traction would link up with the system operated by the railway, which contemplates operating a bus line in connection with the interurban service. All this hinges, however, on the approval of the director of public utilities.

Franchise Draft Presented

Kansas City Document Before City—Sliding Fare Scale Suggested with Extra Return for Economical Operation

WILLIAM G. WOOLFOLK, representing the reorganization interests of the Kansas City Railways, Kansas City, Mo., on May 25 submitted to Judge H. F. McElroy, City Manager, a proposed new 30-year franchise. In the new plan a valuation of the properties of $33,000,000 was assumed as a basis, it being provided that the 7-cent fare be retained for the present.

In the Jost franchise, now in effect, the general provisions for track extensions are thought to be rather too liberal. The new plan provides for track extensions by ordinance of the city "accepted by the company."

Judge McElroy recently warned the officers of the Kansas City Public Service Company, the proposed successor to the Kansas City Railways, that no financial concession may be expected from the city. Hence, the proposed plan retains the provisions in the old franchise in connection with the paving and cleaning between tracks, viaduct rentals and street car licenses.

The plan also provides for the creation of a barometer fund of $600,000. Any excess earnings, over and above the $2,310,000 a year, will be added to the barometer fund. Whenever that surplus fund is more than $900,000 at any quarter, the fare will be reduced to the next lowest step in the scale, on the first of the following month.

The provision for earnings in connection with the ten various fares suggested is so arranged as to stimulate the practice of economy to reach points where lower fares may become effective, inasmuch as the franchise provides for higher earnings on the lower fares. For the period during which the cash fare is 5 cents, the return shall be at the rate of 8½ per cent per annum; when the 6-cent fare is in effect the return shall be 8 per cent; for the 7-cent fare, a return of 7½ per cent and, for the 8-cent fare, a return of 7 per cent per annum.

The new company's return is to be made cumulative after Jan. 1, 1928, under the proposed franchise. After that date, any deficiency in the 7 per cent earnings will be paid from future gross earnings and will draw 7 per cent interest in addition.

Bus Operation Will Be Continued

The bus system, started a few months ago by the receivers of the Kansas City Railways, is to be retained under the new plan, and the present bus franchise is made a part of the proposed franchise. Universal transfers between bus and street car are to be continued.

Replacing the old and intricate system of a city board of control and city representation on the board of directors of the operating company, which was in vogue before the advent of the receivership, the new officials have provided that the city shall receive the same reports as rendered to the president of the company and will have the right to make independent audits.

Interurban provisions of the old franchise are retained, and it is provided that the new company shall spend not less than $2,000,000 during the first three years for rehabilitation of the railway system.

In addition, the city is granted the right to buy the property on a basis of $33,000,000 plus any additions to the property and the capital that shall have been made in the interim. The franchise is made to terminate on Jan. 1, 1956, eliminating the necessity for a popular vote, which is required for all franchises of a duration of 30 years or more.

Judge McElroy announced that he would confer with the members of the

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Council, and that he would set a date for an informal hearing to be held on the franchise after that conference. He is said to be anxious to consider seriously any reasonable proposal and to desire settlement of the project at the earliest possible date commensurate with the details involved. Mr. Woolfolk supplied printed copies of the proposed franchise.

Only One Remedy for Traffic Congestion

New York Committee Holds Streets Were Built Primarily to Facilitate Traffic Movement, Not for Parking—Makes Earnest Plea for Recognition of Rights of Majority, Non-Users of Autos

ACCORDING to the preliminary report of the Manhattan surface line operators' traffic committee the traffic problem of the Borough of Manhattan, New York, will not be solved until its primary cause is recognized and a suitable remedy applied. About this problem the committee feels:

It will not be solved by demolishing hundreds of millions of dollars' worth of masonry from one end of the island to the other in order to construct new thoroughfares.

It will not be solved by chopping down trees and encroaching on our open spaces in order to lay new miles of asphalt.

It will not be solved by bridging over street intersections or by building elevated roadways or by reducing the width of sidewalks or by lopping off ornamental fronts from residences.

The committee points out that Fifth Avenue was widened some dozen years ago and today is more congested than ever. More recently, First Avenue was transformed into a wide, well-paved thoroughfare. Lafayette Street, Park Avenue and Varick Street have all been utilized in the city's quest for additional lanes of vehicular travel. Says the committee:

Each of these improvements was highly desirable, but collectively they failed of their primary purpose, the relief of traffic congestion, for the simple reason that New York is always confronted with an excess of traffic which may be described as pent-up, awaiting the opportunity to utilize additional roadway space.

No one who has devoted any study to the traffic situation can doubt that within 30 days after the opening of a new longitudinal thoroughfare the congestion would be as great as it is today. If one does doubt it, let him consider traffic conditions on our crosstown streets, of which there are more to the mile than in any other city, and which, in spite of this fact, are even more crowded, at least in the midtown section, than the longitudinal routes.

The committee is of the opinion that the cause of traffic congestion cannot be found in the growth of population. It says that while there has been a considerable gain in the metropolitan area as a whole during the past decade, the recent state census revealed an actual decrease in Manhattan, where the situation is most acute. Nor is business activity primarily responsible. It may be a contributory factor, but the congestion has increased steadily under all manner of business conditions—good, bad and indifferent. Furthermore, congestion in those sections of the city where the pleasure car predominates is noticeably worse than in districts given over largely to trucking. On this subject the committee says:

The private car riding habit is responsible for nine-tenths of the congestion. The automobile has brought comfort and happiness to many millions of people and prosperity to thousands of others, but it certainly has played hob with city traffic.

Before its advent and, indeed, until every other family owned a car, people living in and near cities traveled in public conveyances between their homes and the "point of interest," which might lie in a business section, the shopping center or the amusement district. Now, however, as many of them as can conveniently find roadway space travel between their homes and the point of interest in private cars.

The number of private cars now seen on downtown and midtown thoroughfares represents only a small proportion of the total number in the metropolitan district. The rest are kept out of the congested sections by lack of roadway space. Whenever a street is widened or a new one opened a few more are able to trickle in, with the net result that they and not the general public are benefited.

The committee wants the public and the public authorities to know that this is what has happened time and again and that it is what will continue to happen until the necessity of restricting or discouraging the influx of private automobiles in congested sections is recognized.

A check of vehicular traffic on one of the principal thoroughfares reveals the fact that the average private automobile and taxicab carries 1.7 persons, exclusive of chauffeur. The roadway space occupied by an automobile is about 72 sq.ft., so each passenger takes up 42 sq.ft. of city street.

The average street car occupies approximately 320 sq.ft. It seats more than 40 passengers and carries more than 80 when filled. Larger cars have a relatively higher seating capacity. The proportionate part of the street space required for each seated passenger is about 8 sq.ft.; when the car is filled each passenger takes up only 4 sq.ft. or less. The amount of roadway space required to transport a person by private automobile is, on the average, seven or eight times as great as is required to transport him by street car. Significant as are these figures they tell only a part of the story, for according to the committee they ignore the fact that the average private automobile in the congested sections occupies roadway space not only when its owner is in transit but when he is in his office or a theater, a store or a restaurant. In conclusion the committee says:

This brings us to the crux of the traffic situation—the parking evil. On any street where traffic is dense, lines of parked cars can be seen along each curb. The number of travel lanes on these thoroughfares is thus reduced one-third to one-half, depending upon the roadway width of each.

There can be no traffic relief so long as this condition exists. The problem would be solved overnight if we could bring ourselves to tackle it fearlessly and intelligently and with a determination to consider the vital interests of the general public rather than the convenience of a few.

Many if not a majority of these parked cars are owned by residents of other boroughs and the suburbs. When the vehicular tunnel to New Jersey is opened next fall the number of non-resident motorists who add daily to the congestion on Manhattan's streets will be increased materially. Their ranks will be augmented also by fleets of interurban buses, collecting passengers at the curb in the shopping and theatrical districts. Many of these buses are already in operation.

If parking is to be prohibited or restricted on congested thoroughfares, the time to consider suitable measures is at hand. The carrying capacity of our streets is now sorely overtaxed. Relief ought to be afforded before the situation is complicated by a further influx of unregulated traffic.

Parking prohibition, which need not interfere with proper loading or unloading, would automatically release for moving traffic two additional lanes of travel on every thoroughfare to which they were applied and also would discourage the movement into the restricted area of thousands of motor cars that are now parked there unnecessarily. Offsetting any inconvenience which such restrictions might impose on a comparative few is the great gain which unquestionably would accrue to the general public through the speeding up of all forms of traffic.

Unless we are willing to admit that motor car owners constitute a specially privileged class, parking can hardly be considered an inalienable right. Surely, if the city may restrict the height of buildings erected on private property and say what kind of business they shall or shall not be used by, as, fortunately, it may do under the building and zoning laws, it may quite properly prohibit the use of its own streets for the storage of automobiles.

$10,000,000 Skokie Valley Route Opened

Saturday, June 5, one year almost to the day from the date construction was begun, saw service started on the new $10,000,000 Skokie Valley route of the Chicago, North Shore & Milwaukee Railroad. A special train carrying a party of newspaper men and company officials left Chicago Friday morning on a final inspection trip.

Described by President Britton I. Budd as "an event of great importance in the development of the Chicago Metropolitan District," the opening of the new line will place within commuting distance of the Chicago Loop a large area to the west of the Shore Line route of the North Shore Line hitherto inaccessible through lack of transportation facilities.

The Skokie Valley route will also furnish high-speed express service between the Chicago Loop and Libertyville and Mundelein and will reduce the running time of limited trains operating between downtown Milwaukee and Chicago. Express service on the old Shore Line route between Chicago and Highwood and Waukegan will be maintained, but the through Chicago-Milwaukee limiteds will be operated over the new line, connecting at North Chicago Junction with Shore Line trains. Four trains will be run every hour in each direction on the Skokie line.

Completion of the project under the direction of D. H. Howard, engineer of construction, in less than a year is declared by engineering experts to be an outstanding example of speed and efficiency. Work trains have been operating daily over the new line with electric power from the five new automatic substations, furnishing tests to insure maximum operating efficiency in regular train service.

Nine passenger stations of unique Spanish design were built, 48 miles of track laid, 138 miles of wire strung and 469 catenary bridges, comprising 1,200 tons of steel, were installed in the course of the line's construction.

Trains of the Chicago Rapid Transit Company, which, under the terms of a lease, have been operating for more than a year over a completed portion of the Skokie Valley line as far as Niles Center, will continue in service.

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Wage Issue in New Jersey

Public Service Railway Gives Views on New Agreement—Wants Old Wages

The wage issue affecting trainmen of the Public Service Railway, Newark, N. J., and its allied properties is up for consideration, with Amalgamated officials planning sessions in the near future on the course to be pursued. The agreement at present in effect between the association, the Public Service Railway, Public Service Railroad and the Public Service Transportation Company expires by limitation on Oct. 1, 1926. In the hope of reaching an amicable arrangement the company, through M. R. Boylan, vice-president in charge of operation, on June 1 made a public statement of its position in the matter.

He first referred to the present agreement, involving an increase in wages, which upon the former operating basis, it was estimated, would cost the Public Service Railway some $2,000,000 a year. It was evident, he said, that the revenue available under the fare in effect at the time would not absorb this additional cost, especially under the conditions of bus competition then existing. Mr. Boylan said this fact was recognized by the State Board of Public Utility Commissioners, which, after careful consideration, suggested that the Public Service Railway put into effect a 5-cent fare good for a ride within the limits of the larger cities, with an additional 5-cent fare for rides in adjacent suburban territory, no transfer to be issued. This rate of fare was substantially that charged by buses.

The utility commission at the same time stated that it would regulate bus competition in accordance with the law and would endeavor to secure the co-operation of the municipalities to the same end. It also declared in favor of a modification of the company's paving obligation. Under these conditions the company accepted the suggestion of the board and put the 5-cent fare into effect, and has since extended it to cover all of its lines. The company realized that only by the greatest economy and efficiency of operation could the revenue received be expected to be sufficient to pay expenses.

According to Mr. Boylan's statement, as far as the company's operations are concerned the result aimed at has been in part, achieved. One-man operation, which offered the maximum rate wage to every operator, was put in effect and efficiency and economy of operation have been to a certain extent attained.

In speaking of the company's losses, Mr. Boylan said that in order to reduce bus competition the Public Service Transportation Company between Oct 1, 1923, and Jan. 1, 1926, raised and expended for buses new capital to the amount of approximately $11,430,000 and will during the present year raise and expend an additional $6,345,000, or a total of $17,775,000. He said every effort had been made to secure the co-operation of public authorities to the end that bus and car service be co-ordinated and the waste inherent in duplicate and useless service be eliminated and it has appealed to the public and to the state Legislature for the removal of unfair and unjust paving charges. While considerable progress has been made in securing the co-operation sought, paving charges still remain a burden upon the company and co-ordination of car and bus service is far from being complete, so that, unfortunately, from every standpoint, the utmost efforts have failed to bring the cost of operating the three companies within the revenue which fares provide. In the 30-month period between Oct. 1, 1923, and April 1, 1926, the three companies together showed a loss for the period of $3,534,217.

It is the opinion of the companies, Mr. Boylan said, that the situation can be corrected by complete co-ordination of street car and bus facilities and relief from paving obligations, combined with a return to the rate of wages in effect prior to Aug. 1, 1923, and still greater co-operation from employees.

Westchester Argument to Take Place on June 11

The appeal of creditors of the Westchester Street Railroad, White Plains, N. Y., to enjoin Leverett S. Miller, the receiver, from discontinuing service on the trolley lines until the property is sold will be argued before the Appellate Division in Brook'yn on June 11. The court annnounced on June 2 that in the meantime the stay would be operative. The announcement was made later that trolley service would be maintained in White Plains, Scarsdale and Tarrytown for the next several days until arrangements are completed for the operation of buses by the County Transportation Company, a subsidiary of the New York, New Haven & Hartford Railroad, which has just obtained franchise rights covering extensive bus routes in Westchester County. Announcement was also made that the Westchester Street Railroad would continue to operate its cars. The reason assigned was lack of substitute transportation facilities.

The sale of the property of the Westchester Street Railroad was ordered in mortgage foreclosure proceedings brought by the Farmers' Loan & Trust Company of Manhattan, as trustee for the holders of bonds amounting to $225.000, which are long overdue. When Justice Morschauser granted an order permitting the receiver to discontinue operations on May 31 the creditors at once applied to the Appellate Division in Brooklyn for a restraining order. They maintained that to stop the operation of cars would damage the property and injure their interests.

The result of recent developments is that bus operation across Westchester County will be established as soon as the necessary consents have been received by the County Transportation Company from municipalities along the Sound shore. It will mean that the New Haven Railroad has a virtual monopoly of intra-county transit facilities in Westchester.

L. S. Miller, receiver of the Westchester Street Railroad, is president of the New York, Westchester & Boston and also of the County Transportation Company, which has obtained the bus franchise.

Louisville Advertises Its Need

The Louisville Railway, Louisville, Ky., recently published in local newspapers six letters, one each day, telling of its needs. This advertisement followed a letter to Mayor A. A. Will, advising him of the intended publicity work. The company is anxious to secure a franchise which will permit it to expand and enlarge its operations, not possible under the present grant with its maximum rate of 7 cents.

During the week the Louisville Real Estate Board adopted resolutions calling for a new ordinance for the railway with no fare limitation. The real estate men are handicapped in suburban development on account of lack of street railway facilities.

Seeks Eight Cents in St. Louis

Receiver Wells of the United Railways, St. Louis, Mo., on June 3 applied to the Missouri Public Service Commission to increase immediately car fares to 8 cents, two tokens for 15 cents, stating that the company under the present 7-cent fare was unable to earn a fair return on valuation. No change was sought in children's fare of 3 cents. Mayor Miller stated that the city would oppose the increase, but that the service-at-cost franchise now being negotiated would be presented to the public in three weeks. Federal Judge Faris authorized the application for an increase, which would net the company about $1,200,000 annually. Hearing on the application was not set.

I.C.C. Schedules Hearings

The hearing assigned by the Interstate Commerce Commission on the application of section 15-a of the interstate commerce act to the Hudson Valley Railway of Glens Falls, N. Y., originally set for June 1, has been postponed until Aug. 3. The hearing on the Grand Rapids, Grand Haven & Muskegon Railway has been set for June 15.

Section 15-a of the transportation act of 1920 excludes from its provisions all railways not engaged in the general transportation of freight. It has been the contention of the American Electric Railway Association that under this provision a great many interurban electric railways which transport freight incidentally but are not operated as part of a general steam railroad system should be included in this exemption and therefore are not bound by the terms of the act. This view has been accepted by the Interstate Commerce Commission, which has agreed to consider the case of different roads individually and decide whether any such road comes under provisions of the act.

Under this ruling two hearings have been conducted. The first, held last December, was that of the Lackawanna & Wyoming Valley Railroad, in which the commission decided that on the records presented the road came under the provisions of the act. But it said, "Future changes in the traffic or operation of the carrier may justify a change in its classification." The other hearing so far held was on May 25 and was of the Interstate Public Service Company of Indianapolis. No decision in this case has been handed down yet.

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Denver Does Some Boosting

It Isn't a City Without Electric Street Cars—It's a Better City with a Real Good Street Car System

Folks in Denver, Col., are inclined to agree with the caution of this article and to say: "Well, we must have one of the better cities because we have electric cars operated under a system that is incomparable, when its good qualifications are considered."

As he stood at the "Loop" and watched the various cars wind around, a representative of the JOURNAL smiled his approval when he saw on the front dashboard a large sign which read:

BUY A HOME IN DENVER
It's a Great Place to Live.

Why the sign; what the object? Well, the tourist season is beginning. Every day brings hundreds of visitors to the mile-high city and everybody wants a home. Many want a new home, a new place to live, and here is the silent salesman, a homy welcome, an invitation, a declaration that a great place to live is right in Denver. Words like these convince the citizens and the newcomer because they see the declaration flashed every few moments when the electric cars glide by smoothly.

Isn't this the work of some realtors?

No, indeed. It was suggested by W. G. Simmonds, purchasing agent of the tramway, and the directors took to it like a duck does to water. General Manager Robertson said:

> We feel that it is part of our duty to do anything we can to build up our already beautiful city. There has been a wonderful growth in the last few years, both in number and quality; there is much room for more and the way to get it is to go after it, and that is just what we are doing.
>
> We shall carry these signs for an indefinite period; that is, we have placed no limit during the summer season, but we will change the wording of the cards.
>
> There are more than a hundred slogans. We expect to change the cards twice a week, and it may be that we will vary the exhibit, that is, not place them in a numerical row and use them in order, but placard in line with the day's events.

On all the posters the words "It's a Great Place to Live" will be used. President Ernest Stenger said:

> First we are going to educate permanent residents and then we are going to devote our space to the thousands of tourists who will be visitors in the city between June 1 and Sept. 1.

Summing it all up one is forced to conclude that the tramway is doing for the city more than any other method, hence various improvement associations, the realtors, the city fathers are calling in person, via the telephone and by the use of the mails, to say to President Stenger and Vice-President Robertson:

> Oh boy, but you folks have hit upon a wonderful educative idea. Our sincere thanks, appreciation and obligations are yours. As advertisers you may go to the head of the class.

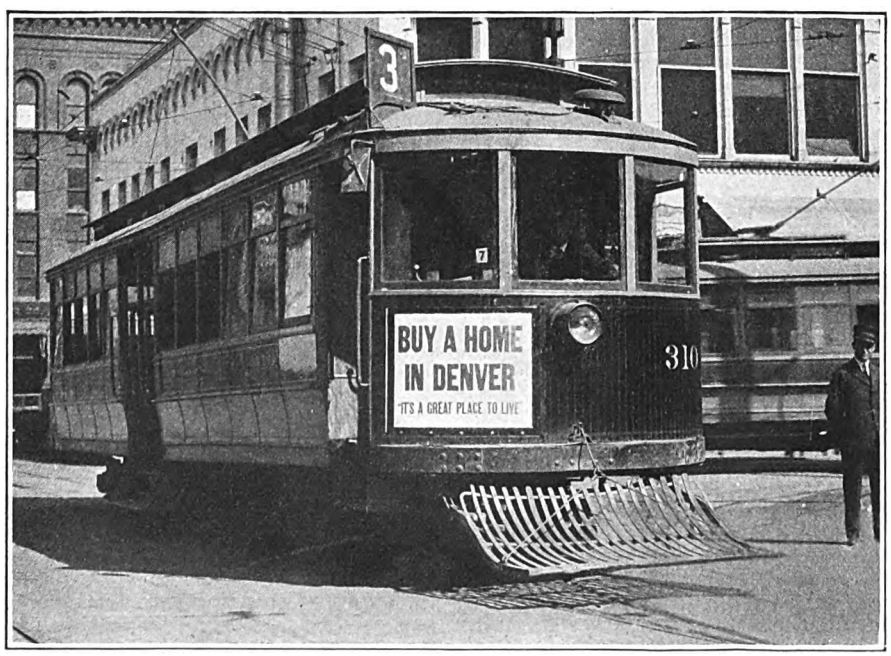
One man upon leaving Mr. Robertson said:

> Never again will I accuse you folks of being nickel nursers.

The V.-P. grinned. Try it in your own city, for be it ever so humble there's no place like home.

Oh, yes, here's one more slogan:

> A good thing to remember and a better thing to do is work with the construction gang and not the wrecking crew.



Emphasizing the Value of Denver as a Place of Residence

Labor Wants Say in St. Louis Franchise

Action of the local Amalgamated union at St. Louis, Mo., in demanding certain concessions in the new United Railways franchise being drafted by city officials was indorsed by the Missouri Federation of Labor at Jefferson City on May 26.

The carmen want official recognition in the franchise of their right to organize, the right of a six-day work week, the right to have differences with the company arbitrated and a provision against the use of one-man cars in congested districts.

While not expressly advocating that members of organized labor should oppose a franchise that does not contain such provisions, the resolution adopted by the state labor convention calls upon labor men to support any fair and reasonable franchise ordinance containing the provisions listed.

International Railway Seeks Loan for Reconstruction

Bernard J. Yungbluth, president of the International Railway, Buffalo, has suggested that the Buffalo City Council loan the railway $750,000 with which to proceed with reconstruction of its Seneca Street line from the city line to Main Street. The railway points out that the city has $5,170,000 in cash on deposit in Buffalo banks and the loan could be made without impairing the city's financial reserve. When the suggestion of the International Railway went before the City Council the city law department ruled that such a loan would be illegal and no formal action was taken. The city law department informed the Council that the company now owed the city $8,000 for paving between the tracks in Main Street some years ago and no effort had ever been made by the company to reimburse the city. The Council ordered the corporation counsel to bring suit against the International to recover the $8,000.

Formal notice has been served on the city by the railway that it is without funds with which to proceed with the rehabilitation of its tracks in several streets which were recently ordered by the Public Service Commission. The railway will appeal to the Appellate Division of the Supreme Court in an effort to have the decision of the state utilities board reversed.

Street Railway Commissioner at Des Moines Attacked

Charges that Mayor Fred Hunter and Councilmen John Jenney and Mrs. C. H. Morris planned in a secret meeting with J. Ben Wiley, secretary of the local street car men's union, to oust Col. Harry E. Wilkins, city street car supervisor, have been made by W. F. Mitchell, commissioner of streets.

In a public statement Mr. Mitchell declared that Mayor Hunter admitted that Mr. Wiley had made charges against Mr. Wilkins. The Mayor later said an investigation would be made.

Mr. Wiley admitted that he had charged Wilkins with being in too strong accord with railway officials, and that Mr. Wilkins, so far as the record shows, had never "gone to bat" with company officials over the rights of the public he is supposed to protect.

Under the terms of the franchise, the city supervisor has equal authority with the company's supervisor in the matter of determining proper service. Mr. Mitchell, who appointed Mr. Wilkins, declared that the fact that the supervisor lives in harmony with car officials is no indication that he is not looking after the rights of the public.

Mr. Mitchell further complicated matters by declaring that if Mr. Wilkins is ousted by the Mayor and Councilmen Jenney and Morris he will be promptly reappointed to the office. Mr. Mitchell said that under the terms of the franchise the nomination of the city car supervisor rests with the head of the Department of Streets.

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New Agreement Submitted at Providence

Amalgamated officials submitted a draft of a new wage and working agreement to the officials of the United Electric Railways, Providence, R. I., on May 17 to replace the agreement which is now in effect, though theoretically expiring on May 31. To date no progress has been made as to acceptance of the compact.

The present rate of pay for motormen and conductors is 56 cents for the first three months of their employment, 59 cents for the next nine months and 61 cents after they have been employed one year. The new agreement asks 61, 65 and 70 cents for corresponding periods, an increase of 5, 6 and 9 cents an hour. The present pay of one-man car operators is 6 cents more than is paid motormen and conductors in two-man crews, and the new agreement asks that this be increased to 10 cents. The same differential is asked for motormen and conductors while acting as instructors and for bus drivers. Nine cents increase is requested in all of the mechanical and miscellaneous departments and for car starters, inspectors, money counters, checkers and clerks. In the freight department the agreement asks for 2 cents an hour more for motormen and conductors than is paid in the passenger department and 10 cents an hour more for the crew of the electric engine than is paid to the freight car crews.

The agreement calls for a general increase in all departments of the service, the institution of the 48-hour week, where it can be arranged without impairing the service to the public, and a slight rearrangement of runs so that at least 50 per cent of the scheduled runs shall be eight hours straight, two-thirds of the rest not to exceed eleven hours outside time, the remaining runs not to exceed thirteen hours outside time, and a guarantee of eight hours per day to all regularly employed motormen and conductors.

The relations between the company and the union are not changed, the company being asked to agree that there shall be no discrimination against employees because of their membership in the union and the union agrees that there shall be none on its part against new employees who refuse to join the union. Employees who are now or may later become members of the union, however, must remain members in good standing during the period of the employment.

Seniority rights in promotion in the different departments are asked in all cases when the senior employee of the department is able to qualify for the higher position.

Expiring Franchises at San Francisco Cause Comment

A scheme has been put before the Supervisors of San Francisco, Cal., to meet the emergency that will arise in the near future when the principal franchises of the Market Street Railway expire. Briefly, this plan proposes that the city turn over the municipal lines to the corporation for operation on a partnership basis, instead of wrestling with the difficulties of extending the municipal system over all the existing lines.

The situation is complicated. The franchises do not all expire at one time. In some instances the franchises overlap, so that disconnected portions of the system will expire at widely separated intervals. To take over operation of some routes the city would have to acquire the franchises on those portions where they were unexpired. The company owns the tracks, cars and equipment. To operate the lines the city would have to acquire the tracks and cars or replace tracks and cars with new ones. Naturally this situation has provoked considerable editorial comment. For instance the *Chronicle* said recently:

> The common sense procedure at this time is to get at the facts. We need a transportation commission, whose members are not in politics and not affiliated with Market Street Railway interests, to study the situation and recommend such measures as it can formulate to deal with the case. Then the best method can be selected. Can nothing be done to awaken our public officials to the desperate need for prompt action in creating such a commission?

Wage Increase at Cleveland Accepted

The board of directors of the Cleveland Railway, Cleveland, Ohio, at a meeting on May 27 approved the wage increase to trainmen and all other employees. This is an increase which was ordered on April 27, the day following the City Council's approval of the amendments to the Tayler franchise. The bulletin concerning this increase follows:

> Effective on May 1, 1926, and until further notice, the wage scale for motormen and conductors will be:
>
> | | Cents per Hour |
> |---|---|
> | First three months of service..... | 65 |
> | Next nine months of service..... | 68 |
> | Thereafter ..... | 70 |
>
> All working conditions will remain unchanged. These are specifically those stated in notices of May 6 and June 22, 1925.

Part of the train force are members of Division 268 of the Amalgamated Association. After the bulletin on the wage increase was posted members of Division 268 met and considered the effect of the company's announcement, and a committee was appointed by them to discuss it. On May 17 the street railway company issued the following bulletin:

> *To Motormen and Conductors, All Lines:*
>
> In considering with representatives of you who are members of Division 268 the working conditions bulletined you on April 27, we have agreed that the general manager will meet these representatives semi-weekly and the president semi-monthly.

Members of Division 268 voted by ballot at the fourteen operating stations of the company on the question of accepting the increase or attempting to secure amendments to the Tayler grant by referendum. The vote to accept the increase was approximately three to one.

Company officials estimate that the increase will add approximately $700,000 to the annual expenses. They are of the opinion that the present rate of fare will produce an income sufficient to care for the increase, but their ideas probably will be expressed in greater detail after June 6.

$80,000,000 Electric Interurban Under Discussion

Engineers of the Atchison, Topeka & Santa Fé Railroad, it is said, have selected stations along a proposed route for an electric railway line between Bakersfield and Los Angeles at a cost of approximately $80,000,000. Present plans call for the construction within the near future. W. R. White, local agent of the Santa Fé, verified the statement that surveys for the electric interurban line have been made. The line would be approximately 101 miles in length. Rumors have it that joint committees of both the Santa Fé and Southern Pacific companies are considering such a project.

Michigan Elevated May Construct Monorail in Detroit

Following a meeting attended by Mayor John W. Smith of Detroit, G. Ogden Ellis, president of the Street Railway Commission, and H. U. Wallace, general manager of the Detroit Municipal System, it was announced that the Street Railway Commission is agreeable to the proposal that the Michigan Elevated Railway be granted permission to erect a half mile or a mile of its overhead monorail rapid transit system in Detroit at its own expense. It is understood that the granting of this permission will not bind the city in any way with respect to the overhead monorail system, and that the experimental line is to be removed without expense to the city whenever such action is desired by the city.

The recent conference at which the decision was reached grew out of the fact that a letter to the City Council was referred by the Council to the commission. The opinion was expressed that no one should be interfered with in efforts to solve the problem. Action by the Council is awaited.

Another Franchise Drafted in Chicago

Although its present franchise has a number of years to run, a new ordinance for the Chicago Rapid Transit Company, operating elevated lines, was completed on June 1 by Corporation Counsel Busch. It will be submitted to the committee on local transportation of the City Council at an early date.

Like the surface lines ordinance which was recently approved by the committee, the measure is a tentative draft and subject to change. The outstanding feature of the elevated ordinance is that it provides for unification of the elevated and surface lines. There is no law which compels the elevated to submit to such an arrangement.

That the new ordinances will not be acceptable to either the Chicago Surface Lines or the Chicago Rapid Transit Company is regarded as a foregone conclusion by Mr. Busch. Speaking before the Chicago Association of Commerce on June 3, the attorney declared that both ordinances are dependent upon the enactment of state legislation that will permit the municipality to issue terminable permits and to regulate the utilities to which they are issued.

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Winnipeg Difficulties Before Board

The Dominion government has appointed a board of conciliation to inquire into the dispute between the Winnipeg Electric Company, Winnipeg, Man., and its street railway employees. The one big union unit had applied for such a board because the company had refused to negotiate an agreement. When the agreement expired on April 30 the company took the stand that it would not negotiate an agreement with any body of men whose affairs were controlled or whose actions were influenced by the one big union, a communistic organization, which had somehow gained control of the committee representing the men following the signing of an agreement with the Amalgamated in 1922.

More details of the quarrel were given in the ELECTRIC RAILWAY JOURNAL, issue of May 22, 1925, page 898.

P.R.T.-Public Service to Run Delaware Bridge Buses

The Philadelphia Rapid Transit Company-Public Service Railway proposal for the operation of buses on the Delaware River Bridge, guaranteeing a minimum annual return to the Bridge Commission of $100,000, will be recommended for approval by the commission at its next meeting.

The two transportation companies of Philadelphia and Camden will operate as the Penn-Jersey Transportation Company. Their offer made on May 28 to the transportation committee of the Joint Bridge Commission carries with it an agreement to pay 40 cents for double-deck buses and 25 cents for single-deck vehicles crossing the span. The bridge is fast being rushed to completion. It probably will be opened within the next few weeks.

Sunday Passes in Des Moines

The Des Moines City Railway, Des Moines, Iowa, has received permission from the City Council to institute a special 25-cent ticket for Sundays only, beginning on June 6. Tickets will be sold on the cars and will be good for an unlimited number of rides. They will be transferable and may be used any number of times by one person up to midnight.

F. C. Chambers, president of the company, said the plan will be tried for 60 or 90 days as an experiment. He said:

> We want more riders. It is often claimed that a greater number would ride the cars if the cost were less. If low fares stimulate riding, this experiment should make that fact obvious. The holder of the special Sunday ticket may have any rate of fare he desires merely by taking more rides.

Hearing Set to Discuss Sale of New York City Car Lines

An invitation was extended on June 3 by the Board of Estimate of New York City, N. Y., to every street car and trolley company operating in New York City to appear before the board at a public hearing on June 22 to initiate proceedings looking toward the sale of their property upon equitable terms to the city.

The actual resolution was that which was presented a week ago by former Comptroller Charles L. Craig and defeated through the negative votes of Comptroller Berry and President Julius Miller of Manhattan. It provided that a date be set for a public hearing to determine whether the Fourth and Madison and also the Eighth Avenue trolley lines constituted an "obstruction to traffic and an ill use of the street." The resolution was adopted on June 3 unanimously with an amendment that similar applications on the part of all other street car companies would be taken up at the same time.

I. C. Electrification at Chicago Nearly Completed

So rapid is the progress being made on the electrification of the Illinois Central Railroad's Chicago terminal that predictions made months ago that the first electric trains would be running by July 1 of this year will probably be definitely verified.

The first suburban trains to be changed over from steam to electric propulsion, according to an announcement by President C. H. Markham, will begin operation early in July between Randolph and 67th Streets. Construction forces have been increased until approximately 4,000 men are now employed in outdoor work on the terminal, in addition to large engineering and clerical staffs in the company's offices.

All overhead steel structures, involving the placing of 4,300 tons of steel, have been erected. The stringing of 293 miles of transmission wires and more than 100 miles of contact wire has already been completed. The company has tested 37 two-car units, while 60 more are soon to be tried out. Other equipment is set for early delivery.

Two car inspection plants, costing $650,000, will be completed by the middle of June. Temporary suburban station facilities are almost ready for use.

News Notes

Submitting Names in Worcester.—The contest is on until June 15 in Worcester, Mass., for a suitable name for the new monthly pamphlet issued by the Worcester Consolidated Street Railway. The name of the new publication together with the winner of the $10 prize will be announced in July.

Ride Free in Greensboro.—Meyer's department store in Greensboro, N. C., chartered all the cars and buses of the North Carolina Public Service Company for one hour on May 11, giving the residents of the city an opportunity to ride to the city free of charge. The store's annual anniversary sale began on that date.

Automatic Windshield Wipers for Indiana Cars.—Representatives of about twenty electric railways in Indiana who gathered on May 28 for a conference with members of the Public Service Commission at the statehouse agreed that within 90 days they would comply with a request from the commission to install automatic windshield wipers on all of their cars.

New Magazine in Toronto — The Toronto Transportation Commission, Toronto, Canada, is publishing a new house organ, called the *Coupler*. A commentator states that among its leading opinions is the difference between a coach and a bus—4 cents and a transfer.

$7,226 as Paving Share.—After deducting a claim of $577 against the Madison Railways, Madison, Wis., the finance committee of the Council voted to recommend that the company pay $7,226 to the city as its share of the cost of repaving and repairing the streets on which its lines operate.

Improves Properties at Resorts.—The Connecticut Company has awarded a contract to the H. Wales Lines Company, Meriden, Conn., for remodeling its pavilion at Lake Quassapaug, Middlebury. The improvement is in line with a general revamping of the company's properties at popular resorts.

Wage Settlement in Pottsville.—Employees of the East Penn Electric Company, Pottsville, Pa., won a partial victory on May 26 when the award of arbitrators was made known, ending the dispute which has been in progress since the beginning of this year. Wages of 61 cents an hour for operators of two-man cars and 67½ cents an hour for operators of one-man runs were allowed. On the question of paying the men for time engaged in eating, which was one of the chief objections of the company to the present schedule, a compromise was agreed upon. On the two-man cars there is no provision for pay, but this is retained on the one-man cars.

Illicit Use of Transfers.—"Bootlegging transfers" is the newest form of sport on the Seattle Municipal Railway, Seattle, Wash., and has resulted in the arrest of two men caught in an attempt to use a street car transfer not issued to them. E. A. Mitchell, public utilities traffic inspector, saw the men accept the transfer from two others. "Transfer bootlegging," Mr. Mitchell declares, robs the railway of large sums of money every year. He declares that members of the "transfer ring" get the slips, which they do not need, and dispose of them for small sums to regular "fences" at transfer points. The men arrested will be tried under the ordinance making it a misdemeanor to defraud by illegal use of a transfer.

No Fare Reduction for Des Moines in Sight.—If increases in the stabilizing fund of the Des Moines City Railway, Des Moines, Iowa, continue as they have the last seven months it will be three years before patrons can expect a reduction in fares. This situation was indicated in the April report for the company. The fund is now only $12,500, an increase of $4,176 in April and about the normal rate since the 10-cent fare became effective in October. The fund must reach $150,000 before the reduction is possible. The report shows 2,031,502 passengers carried in April and revenue of $190,395, while total revenue for the month was $198,690. Operating expenses, depreciation and taxes were $156,435.

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Honor for Transit Man.—Frank L. Raschig, chief engineer of the Rapid Transit Commission of Cincinnati, Ohio, has been elected president of the Cincinnati Chapter of the American Society of Civil Engineers. For the past four years Mr. Raschig served as vice-president of the organization.

Foreign News

Buenos Aires Tramways Makes Report

Result of the operation of the tramway lines in Buenos Aires, Argentine Republic, which city has a population of 2,000,000 inhabitants, for the year of 1925 compared to 1924, is as follows:

Gross earnings:	1925	1924
Anglo-Argentine, surface..	$18,270,280	$18,321,600
Anglo-Argentine, subway..	2,368,880	2,287,360
Lacroze Company.....	3,307,960	3,243,160
Tranvias Electricas del Sud	129,440	124,240
Port and city of Buenos Aires.....	343,640	365,760

German Tramcar Accidents

Causes of accidents and the means of their reduction are dealt with at some length by A. Wolf in a recent issue of *Verkehrstechnik*. Taking as a basis the traffic accidents in Germany from 1899-1919, the figures relating to tramways show that 43.77 per cent of the accidents were sustained by passengers and 56.23 per cent by pedestrians. Of the total, only 8.38 per cent were due to tramway operation. The majority of passenger accidents were caused by boarding or alighting moving cars, sudden application of the brakes, and collisions. Folding steps and gates on the rear platforms would, he believes, reduce accidents due to the first cause.

Transportation in Chile.—Transportation facilities are on the up-grade in Chile. Valparaiso and San Antonio, rival seaport cities, are both connected with the inland metropolis and capital of the state, Santiago, by electric railway lines, the latter city having an advantage of proximity to the capital by a shorter railway haul. However, in Valparaiso an excellent tramway system serves the traveling public, and marked improvement has been shown since the city authorities have had the streets straightened and paved. Funicular railways are used also, to carry the pedestrians from the lower street levels of Valparaiso to the higher ones, because of the abruptly rising hills. Buses, too, will be in more demand and used to a greater extent because of the automobile highway, nearing completion, which will cover these routes.

English Company to Be Bought.—The City Council of Worcester, England, has decided to purchase the tramway of the Worcester Electric Traction Company. It is hoped that this will be done by agreement with the company at a price of about £60,000, so that the cost of an arbitration may be avoided. The Council has introduced a bill before Parliament to give it authority to work the tramways.

Recent Bus Developments

Ordinance Would Provide Tax for Bus Companies

The City Council of Buffalo, N. Y., has directed the city law department to draft an ordinance requiring all bus companies engaged in passenger transportation over city streets to pay the city a percentage of their annual receipts to provide funds for the upkeep of pavements on streets over which the buses operate. In the event that the city law department rules such an ordinance illegal, the Council indicated it would amend all existing bus franchises to provide for the payment of the tax.

According to Commissioner Frank C. Perkins, the large double-deck buses operated by the International Bus Corporation, a subsidiary of the International Railway, Buffalo, are destroying the pavement of the streets over which they operate. Buses have been forced to alter their routes to avoid pavements condemned by the city engineering department. Property owners along several parkways and streets told the municipal authorities that the buses alone have been responsible for the damage done to the pavements. Due to the damage, the Council has voted to repave several streets over which buses operate and one-half the cost will be paid from the general fund of the city and the balance will be assessed against abutting property owners.

Members of the City Council believe the International Bus Corporation should be required to pay a special tax which would be sufficient to guarantee part of the maintenance of these streets. The company's application for a rehearing before the commission on this order has been denied. B. J. Yungbluth, president of the International, says the company has no funds with which to make the improvements.

Substitution of heavy pneumatic tires for solid rubber tires on all double-deck buses of the International Bus Corporation was proposed by the City Council as a means for reducing the damage being done to the city pavements.

Cross-Town Service in Des Moines —No Independent Bid

The Des Moines City Railway, Des Moines, Iowa, has put in crosstown service three new 25-passenger buses of latest design. They have a White engine and chassis upon which is mounted a body built by the Bender company of Cleveland.

Officials of the Capital City Motor Coach Company, who announced several months ago that they would ask the City Council for a franchise to operate here, have made no public request as yet for a permit to operate, although the new Council took office the first week in April.

M. H. Cohen, attorney for the company and a stockholder, said he has interviewed individual members of the Council and expects soon to ask for a permit. In some quarters, however, the continued delay on the part of the bus company executives is interpreted to mean that Mr. Cohen has been unable to secure the promise of enough votes to put the Council on record for buses.

Seeks to Restrain Line

The Amalgamated Association has filed a bill in equity in the Supreme Court at Boston, Mass., to prevent Franklin T. Miller, receiver for the Boston & Worcester Street Railway, from operating a bus line between Boston and Worcester. It is stated that the agreement between the railway and the union provides that at the introduction of a new method of transportation, the matter of the status of the employees would be settled by a conference between members of the union and officials of the company. The operation of buses instead of street cars is a new method of transportation on the route between Boston and Worcester by the railway and, according to the union, becomes subject to discussion under the agreement. It is further brought out that such transportation jeopardizes positions now held by members of the association, and the union proposes to protect its members.

Rules on Standees, Hours and Brakes in Massachusetts

Rules have been adopted by the Massachusetts Department of Public Utilities to cover the number of passengers to be permitted to stand in buses, to govern the number of hours employees are to be permitted to work and to fix the equipment of brakes that shall be provided. On the question of the limitation of the number of standees the commission said:

> Passengers in excess of 25 per cent above the seating capacity of the motor vehicle shall not habitually be carried. Where the number of passengers regularly applying for transportation exceeds that above provided for, it shall be the duty of the licensee to furnish additional facilities to carry such passengers.
>
> In no event shall standing passengers be carried a distance in excess of 15 miles. The use of portable seats for passengers on any motor vehicle shall not be allowed.

On the hours of service of operators the regulations read:

> No owner of a bus shall cause or allow any operator to work as such for more than ten hours in any period of sixteen consecutive hours, except in cases of emergency.

On the question of brakes the commission said:

> Every bus shall be provided with at least two brakes, powerful in action and separated from each other, of which one brake shall act directly on the driving wheels or on parts of the mechanism which are firmly connected with said wheels. The service or foot brake shall suffice alone to stop the bus within a distance of 45 ft., and the emergency or hand brake shall suffice alone to stop the bus within a distance of 100 ft. when the vehicle is moving at a speed of 20 m.p.h., on a dry level road. One of the two brakes shall be so arranged as to be operated by the foot. One shall be a ratchet brake which can be set when the operator leaves the bus. Brakes shall at all times meet with the requirements of any tests made by the department, its representatives or other authorized persons.

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Seattle Bus Purchase Still Uncertain

Protests by organized labor have failed to shake the City Council of Seattle, Wash., in its determination, reached more than a year ago, to replace with a municipal bus line the privately-owned buses operating on Tenth Avenue Northeast. But the Council is still unable to agree as to how the fourteen buses shall be purchased, although the $80,000 for their purchase was appropriated months ago. A proposition is now before the Council utilities committee, sponsored by two Councilmen, providing for appropriating $55,000 to purchase fourteen chassis of designated makes, with an understanding that the bodies were to be built by the municipal railway in its shops. Other members of the Council think that bids should be called for the buses complete, while a minority think that bids should be called separately for bodies and chassis.

The Central Labor Council meanwhile has appealed to the Council, urging that the F. M. Peterson bus line, which for years has furnished service on Tenth Avenue Northeast, be permitted to continue operation. They base their claim on the allegation that patrons prefer the privately-owned bus line to a municipal line. and that under municipal ownership the bus line, operated by the municipal railway department, would add to the annual deficit from the city's various bus lines. The Council feels, however, that since the city is in the transportation business, it should have a monopoly of that business. It is also pointed out that from the 10-cent fare collected, the bus line gets 7½ cents and the municipal railway only 2½ cents, although the haul on the car lines is much longer than that on the buses.

Bus Bids in New York to Be Considered June 14

Probability of any award of bus franchises in New York City before July 1 was diminished on June 1, when the Board of Estimate postponed consideration of several applications until June 14, the date of the last stated meeting of the board before the summer vacation. All these applications were for individual routes instead of for the so-called bus systems, proposed by the Board of Transportation.

Hornell to Have Buses July 1

Buses will supplant trolleys in Hornell, N. Y., after July, when the Hornell Traction Company will suspend operations after years of service at a deficit. The Hornell Council has granted the application of Raymond E. Page, receiver for the railway, for a fifteen-year franchise to operate buses in place of the electric railway that has served the city for 35 years. Virtually the same service as maintained by the trolleys will be kept by the buses. Mr. Page stated that about $50,000 would be invested for equipment for the new bus line and that the trolleys would be kept running until the buses arrive. Application also will be made by Mr. Page for permission to operate buses between Hornell and the neighboring city of Canisteo to replace the present interurban railway.

Stockholders in the Hornell Traction Company will receive nothing and bondholders about 10 cents on the dollar when the affairs of the company are wound up. There is about $120,000 in stock outstanding and $150,000 in bonds, on which about $25,000 in interest is due. The system had been in receivership for some time.

Hearing on Illinois Bus Project Deferred

The petition of the Western Motor Coach Company, recently organized by Britton I. Budd, president of various Insull electric railway properties, which was scheduled for hearing on May 26 before the Illinois Commerce Commission, was deferred until June 15. The Western Motor Coach Company has applied for a certificate of convenience and necessity to operate buses on four main routes out of Chicago, following in general the line of the Chicago, Aurora & Elgin Railroad and supplementing that service. It will operate as far as Aurora, Geneva and other points in the Fox River Valley. This project was referred to previously in the ELECTRIC RAILWAY JOURNAL.

Trolleys Replaced in Winfield.—Railway service in Winfield, Kan., supplied by the Arkansas City-Winfield Northern Railway was abandoned on May 25. Buses will replace the railway line. The bus fare is 8 cents with two tickets for 15 cents, against the railway rate of 7 cents.

Buses Supplant Cars.—Electric railway service will be discontinued in Phenix City, Ala., following permission by the Alabama Public Service Commission. Buses will be substituted to be operated by the Columbus Electric & Power Company. The railway line in Phenix City is owned and operated by the Columbus Electric & Power Company, which company owns and operates the railway lines in Columbus, Ga., just across the Chattahoochee River from Phenix City. The company gave as its reason for discontinuance the fact that the cars no longer paid.

Seeks to Buy Bus Competitor.—The Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, which operates between Cincinnati and the Indiana state line, has asked the Ohio State Public Utilities Commission for authority to purchase the certificate of the Indiana Bus Company. The bus company is a competitor of the interurban.

How the Buses Are "Panning Out."—The Chicago & Joliet Transportation Company, operating buses in the Joliet, Ill., district, recently opened a newspaper campaign to inform customers of the results of bus operation. April figures were printed showing a loss of $1,756, not including charges of interest on investment, depreciation or reserve. Operating revenue was $5,804 and expenses $7,560. There were 66,133 passengers, with an average revenue of 8.8 cents, carried at a cost of 11.4 cents. Coach-miles were computed at 28,850, with the revenue 20 cents a coach-mile and the expense 26.2 cents. The company explains its publication of the figures in this wise: "Motor coach patrons will be interested to know how the line which operates in their vicinity is 'panning out.'"

Supreme Court to Pass on Holyoke Issue.—The Interstate Buses Corporation of Connecticut has taken its appeal to the Supreme Court at Washington in its fight against the Holyoke Street Railway, Holyoke, Mass., which recently obtained an order from the Massachusetts courts restraining the bus company from operating buses in unfair competition with the street cars. The Supreme Court refused to grant a temporary order to allow the buses to continue operations, but has consented to hear the case, which is scheduled for Oct. 4.

Seeks Permission for Bus Line.—The International Railway, Buffalo, N. Y., has filed a petition with the City Council for permission to operate a passenger bus line in Walden Avenue from Bailey Avenue to the easterly city line. The petition says the company desires to operate the Walden Avenue bus line in conjunction with the proposed Best-North Street line, for which a petition for a franchise is now pending in the Council.

Buses Will Replace Car Line.—The Michigan Electric Railway recently notified the City Commission of Owosso and the Corunna City Council that it would abandon service in and between the two towns and tear up its rails. The company said the line had been a losing venture and that it could no longer comply with the requirements of its franchise. Bus service will be substituted for the street cars. The buses will be operated by the Owosso-Flint Bus Line, Inc., an Owosso, Mich., company.

Permits Secured for Bus Operation.—Having obtained all necessary local licenses and state certificates, the New England Transportation Company, subsidiary of the New York, New Haven & Hartford Railroad, has started a bus line connecting Boston, Walpole, Wrentham, North Attleboro, Pawtucket and Providence. The company has opened a terminal at 36 Park Square, Boston. Coincident with the through operation between Providence and Boston, shuttle service between Boston and Wrentham was put in operation. The buses are driven by operators formerly employed by the New York, New Haven & Hartford Railroad. Regular railroad fare tickets are honored on the buses.

Seeks to Substitute Buses. — The Madison Railways, Madison, Wis., has applied to the Wisconsin Railroad Commission for permission to abandon its tracks on Harrison Street and to operate buses from Regent Street to the west city limits. Residents will be furnished service at more frequent intervals. The city of Madison plans to pave Harrison Street this year. It will be necessary for the railway, if it continues its old route, to share in the paving costs. The company plans ultimately to double track Regent Street to the west city limits and abandon Harrison Street, so that the officials do not see the justice in asking the company to pay for paving its share of a street that it will soon abandon.

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Financial and Corporate

Traffic in Capital Stabilized

Washington Company Believes Downward Trend Over—Large Sums Spent for Maintenance

For the year ended Dec. 31, 1925, the balance of income of the Washington Railway & Electric Company, Washington, D. C., credited to profit and loss was $404,226. To this was added other miscellaneous items, making the total credited to profit and loss during the year $644,857. This figure compares with $258,035 for the year 1924. The financial situation of the company was made the subject of the report of President Ham at the annual meeting held on Jan. 16.

During the year 1925 the company's system carried 101,829,572 passengers, of whom 24,323,936 were carried on transfers, leaving 77,505,636 revenue passengers. This indicates a decrease in revenue passengers of 281,039, or only about one-third of 1 per cent, compared with the revenue passengers carried during the year 1924. This is a relatively small decrease compared with that suffered annually since 1919, indicated in the accompanying table.

STATEMENT OF PASSENGERS CARRIED BY WASHINGTON RAILWAY & ELECTRIC COMPANY

	Revenue Passengers Carried	Decrease Compared With Previous Year
1919	91,488,735	
1920	87,782,784	3,705,951
1921	85,481,656	2,301,128
1922	82,716,756	2,764,900
1923	81,518,607	1,198,149
1924	77,786,675	3,731,932
1925	77,505,636	281,039

Although the operations of the company and its subsidiary railway companies with the present fare of 8 cents cash, or tickets at the rate of six for 40 cents, indicate a return of less than 4 per cent on the value of the property within the District of Columbia, fixed by the Public Utilities Commission, the company continued in 1925 the practice of recent years of expending large sums of money on track renewals and repairs. Maintenance of way and structures, together with allowances for depreciation, totaled $981,792. The more important projects completed in 1925 were the renewal of rails and substructure on 1.69 miles of underground construction and renewal of rail and paving on practically 7½ miles of overhead construction, which projects alone cost $469,681. With respect to the rolling stock of the company, two snow sweepers and 24 buses were added during the year at a cost of $177,897.

On the safety contest started in 1921 and continued during 1925 the report says the constant increase in the use of automobiles was a most important factor. Due to this, and to the unusually inclement weather the early part of 1925, that year was one of the most difficult, from the standpoint of safety in operations. These conditions brought about a slight increase in the number of accidents occurring in 1925 compared with the previous year. It is noted that 74 per cent of all accidents were with automobiles. Efforts of the company to draw the attention of the public to the need of care in all street movements, through posters and otherwise, aided in keeping the accidents down. The expenditures for settlements of claims was but 2.76 per cent of total operating revenues for the year.

The total outstanding bonded indebtedness of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, is now $26,282,900, which, added to the $15,000,000 capital stock of the parent company, and $2,093,750 outstanding capital stock of subsidiary companies, makes the total outstanding capitalization Dec. 31, 1925, $43,376,650. This excludes bonds purchased for the sinking funds and for temporary investment.

The total payroll for 1925 of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, was $4,659,090, an increase over the previous year of $377,843. The number of employees in the service of the company's system as of Dec. 31, 1925, was 2,979.

The figures for 1925 in the accompanying comparative table are subject to revision upon final audit.

COMPARATIVE STATEMENT OF WASHINGTON RAILWAY & ELECTRIC COMPANY

	1925	1924
Gross earnings from operation	$4,775,285	$4,759,243
Miscellaneous income (including dividends from Potomac Electric Power Company)	1,025,501	858,802
Gross income	$5,800,785	$5,618,045
Operating expenses (including depreciation), taxes and miscellaneous charges	$3,915,959	$3,820,621
Interest on funded and unfunded debt	730,600	790,675
Payment of dividend on 5 per cent preferred stock	425,000	425,000
Payment of dividend on common stock	325,000	325,000
	$5,396,559	$5,361,297
Balance of income for year 1925, credited to profit and loss	$404,227	$256,748
Miscellaneous items credited to profit and loss	240,630	1,287
Total credited to profit and loss during the year	$644,857	$258,035

In discussing the use of the bus by the company President Ham said:

> The additional buses acquired now bring the total available for operation, as auxiliaries to our street car service, to 44. During 1925 we augmented the rail service by inaugurating four new bus lines. Upon completion of the highway from Bladensburg School to East Riverdale, Maryland, in August, 1925, we extended the bus operations of the Washington-Interurban Railroad to East Riverdale, thereby completely abandoning rail operations on this line.
>
> All of our bus service is operated in coordination with rail service and, while operated at a direct loss, has added materially to the convenience of the public. We realize that through the use of buses new avenues of traffic may be opened up, thereby extending a wider use of all transportation facilities. We are constantly studying the needs of additional bus transportation and since Jan. 1, 1926, have placed in service a new bus line, known as the Rhode Island Avenue Coach Line, operating between Fourth Street and Central Avenue, Northeast, to Nineteenth and "H" Streets, Northwest.

U. S. District Court Must Decide Seattle Tax Issue

The suit of the Old Colony Trust Company against the city of Seattle, Wash., which involved taxes charged against the street railway and light and power properties of the Puget Sound Power & Light Company in 1919, was not a suit against the state of Washington but against alleged harmful acts of agents of the state and hence properly could have been brought in a federal court. The Supreme Court decided this issue on June 1, reversing the decree of the district court which had dismissed the bill for lack of jurisdiction on the ground that it was a suit against the state. The effect of the decision, rendered for the court by Justice Van Devanter, is to send the case back to the United States District Court of Washington for trial.

Early in 1919, the Puget Sound company owned and operated both the street railway system and the electric light and power system of Seattle. It transferred the street railway system to the municipality in March that year under a contract which specified that state, county and municipal taxes should be borne proportionately for the year. The city later refused to pay any part of the taxes against the properties, the bill for the year having been rendered and charged against the company prior to the transfer of the street railway properties. The county treasurer threatened to proceed against the electric light and power system for the full amount of the taxes charged to both systems for the full year. The Old Colony Trust Company filed suit to stop proceedings by distraint and sale, acting as trustee for a mortgage issue of bonds on the light and power system issued in 1921. The tax bill aggregated $400,000, of which $179,000 was for municipal taxes. Under the contract for transfer of the street railway, three-fourths of the taxes were to have been charged to the municipality.

Decreased Earnings in Ottawa

The Ottawa Traction Company, Ottawa, Canada, received from the Ottawa Electric Railway during 1925 $279,075, with which were paid the usual quarterly dividends of 1 per cent and a bonus of 1 per cent. This fact was disclosed in the twelfth annual report of the Ottawa Traction Company for the year ended Dec. 31, 1925. The report itemized the work done during the year in modernizing the plant.

President T. Ahearn in his address to the stockholders said he regretted that the report was not so good as the shareholders were accustomed to receive in that it showed a substantial decrease in gross earnings compared

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with 1924. He stated that in carrying out the terms of its new contract with the city the company had spent a very large amount in improving and extending the system, but that the second year of the contract had just been completed and the results for both the first and second years were much less favorable than those forecast in the report of the city's expert. In this connection he called attention to the possibility of an application for increased fares at the end of the current five-year period. He reiterated the policy of the company to maintain the 5-cent fare in Ottawa if possible and expressed the hope that improved business conditions would enable that policy to be continued.

One of the causes for decreased receipts, he pointed out, was from the operation of buses to and from points outside the city limits. The inroads being made by this competition, if unchecked, would in itself result in increased street car fares. The manager had recently brought the matter to the attention of the Board of Control.

Balance in Oakland $284,194

The passenger revenue of the Key System Transit Company, Oakland, Cal., for the year 1925 decreased $26,694 compared with 1924. The number of passengers carried increased 808,852. The decrease in revenue and increase in passengers carried are explained by the additional passengers taking advantage of the commuter rates, which are lower than regular rates and free transfers. Transportation expenses increased $97,715. The increase of $74,419 in transportation and power expenses added to the decrease of $26,694 in passenger revenue resulted in a net loss of $101,114.

These facts are contained in the annual report of the company for the year ended Dec. 31. C. O. G. Miller, president, stated that as the earnings of the company continued to be satisfactory from the standpoint of operation and the bondholders, they are still inadequate to yield a fair return to the stockholders on their investment and give a fair return on the value of the property devoted to public service.

The company provided additional service to the extent of 207,476 passenger-car-miles and 506,349 bus-miles. The motor coach service performed by the company at regular street car rates with free transfer privileges is resulting in a net annual loss of approximately $124,000. Net additions to the company in 1925 totaled $355,244. The year was marked by important reconstruction work and the purchase of new equipment. As a result of arbitration proceedings between the company and the platform men, an award of the eight-hour day with increased pay an hour was put into execution at the beginning of the new year.

The costs and revenues from Key System bus operations were as follows: Bus-miles in 1925, 850,111; 1924, 340,479; receipts in 1925, $82,076; 1924, $24,145; drivers' wages in 1925, $49,376; 1924, $20,278; other direct costs in 1925, $114,103; 1924, $43,274; state gross receipts tax in 1925, $4,308; 1924, $1,266; overhead in 1925, $29,522; 1924, $11,698; interest on investment in 1925, $9,004; 1924, $4,082; total cost in 1925, $206,315; 1924, $80,601; net loss in 1925, $124,238; 1924, $56,456; passengers carried in 1925, 2,261,739; 1924, 703,641.

INCOME ACCOUNT OF THE KEY SYSTEM TRANSIT COMPANY

For the Year Ended Dec. 31, 1925

Gross operating revenue		$7,289,871
Operating expenses:		
Way and structures	$439,349	
Equipment	564,310	
Power	668,642	
Conducting transportation	2,873,807	
Traffic expenses	21,334	
General and miscellaneous	679,293	
Transportation for investment and construction overhead (credit)	67,542	5,179,194
Net operating revenue		$2,110,676
Less taxes		444,032
Operating income		$1,666,644
*Add-non-operating income		211,560
Gross profit		1,878,204
Sundry charges:		
Depreciation	$689,035	
Amortization of franchises	8,762	
Abandonment of obsolete equipment	1,395	699,193
Balance, current operations		$1,179,011
Deductions:		
Bond interest	$789,757	
Other interest	12,502	
Miscellaneous	22,636	824,896
Surplus, current operations		$354,114
Profit and loss adjustments		35,490
Surplus		$389,604
Surplus from prior year		308,207
Total surplus		$697,811
Less four quarterly prior preferred dividends paid		413,617
Balance to surplus account		$284,194

*Includes $126,408 net revenue, Key System Service Company.

STATISTICS OF THE KEY SYSTEM TRANSIT

For the Year Ended Dec. 31, 1925

Passengers carried:		
Traction division:		
Cash and ticket fares, 6 cents		73,491,050
School tickets, 3 cents		1,987,617
Commutes (East Bay cities)		617,613
Miscellaneous, 12 cents, 18 cents, etc		1,189,953
Total revenue passengers		77,286,233
Free transfer passengers		21,568,238
Total revenue and transfer passengers		98,854,471
Key division:		
Transbay fares, 18 cents	8,724,479	
Commutes, transbay	8,037,406	
Children's fares, 10 cents	212,678	
San Francisco-Sacramento Railroad tickets	237,033	
Miscellaneous transbay tickets	33,259	
Total transbay passengers		17,244,855
Fares (East Bay cities), 6 cents	531,768	
School tickets, 3 cents	43,488	
Total passengers (East Bay cities)		575,256
Total revenue passengers, key division		17,820,111
Entire system:		
Revenue passengers		95,106,344
Revenue and free transfer passengers		116,674,582

Rockford Bonds Must Be Deposited by June 15

Robert W. Baird, chairman of a committee representing the owners of the 5 per cent first mortgage gold bonds of the Rockford & Interurban Railway, Rockford, Ill., announced on May 27 that the committee had fixed June 15 as the limit of time in which bonds might be deposited under the protective committee agreement. The formation of the protective committee of bondholders really dates back to Nov. 1, 1925. Subsequent to the formation of the committee approximately $1,000,000 of bonds was deposited with the committee. The committee then deposited $365,000 of the deposited bonds with the Continental & Commercial Trust & Savings Bank of Chicago, as trustee under the deed of trust securing the Rockford & Interurban bonds and pursuant to the provisions of the deed of trust requested the trustee to institute foreclosure proceedings. Upon receipt of this request the trustee applied for the appointment of a receiver and on Feb. 15, 1926, Adam Gschwind was appointed receiver of the properties of the Rockford & Interurban Railway and the Rockford City Traction Company, security for the Rockford & Interurban bonds. The receiver is now operating the properties covered by the trust deed.

$1,663,698 Loaned to City by Detroit Municipal Railway

During April the Department of Street Railways loaned the city of Detroit, Mich., $1,663,698 on demand notes of the city bearing interest at 4 per cent. William M. Hauser, auditor, made this fact public in presenting the financial statement of the department for the month. This money was loaned out of the various funds of the department as follows:

Sinking fund	$413,698
Interest fund	450,000
Injuries and damages fund	800,000
Total	$1,663,698

The Department of Street Railways would receive only 3½ per cent on this money if it were left on deposit in the banks, while the city of Detroit would be compelled to pay 4.10 per cent to 4.25 per cent if it had borrowed from the banks. Mr. Hauser regards this arrangement as beneficial to both the general taxpayer and the car rider.

The auditor further pointed out that in the report for March, 1926, attention was drawn to the fact that the department had $49,612 available for future capital costs. The amount available for future capital costs at April 30, 1926, is $196,503. In other words, the Department of Street Railways' investment has been brought back to the position where it shows an equivalent in property and equipment for all the money that was put into it, and a surplus of $196,503, an amount by which current assets are in excess of its current debt.

The outstanding bonds, including the Detroit United Railway obligation at April 3, 1926, are given as $37,131,000. There is accumulated in the sinking funds, consisting of cash and securities, $6,059,600 at April 30, 1926, toward paying this debt, so that the net debt remaining to be paid is $31,071,099. The department has an investment in road and equipment of $44,456,472, on which $31,071,099 remains to be paid. The difference between these two amounts, $13,385,373, represents the equity of the city of Detroit in its transportation facilities, and the amount that has been contributed by the car riders toward establishing a city asset represented by its railway system.

The balance of net income for April,

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1926, is $74,587 after the payment of sinking fund charges. The balance of net income for the month of April, 1925, was $74,360, so that the past month shows an increase of $226 over that for April, 1925.

During April, 1926, 43,665,806 passengers were carried by the rail lines and 1,745,087 by the coach lines, a total of 45,410,893 passengers, compared with a total of 40,858,694 in April, 1925, divided 40,190,694 rail lines and 668,231 coach lines. In other words, the department carried 4,551,968 passengers, or 11.1 per cent more in April, 1926, than in April, 1925.

Net Income Improves in Buffalo.—For the three months ended March 31, 1926, the operating revenue of the International Railway, Buffalo, N. Y., was $2,709,594, compared with $2,568,482 for a similar period in 1925. Operating expenses and taxes decreased from $2,342,858 in 1925 to $2,283,271 in 1926. The 1925 expense figure was adjusted to include 3 cents an hour additional wage paid on Dec. 31, 1925, and retroactive to Jan. 1, 1925. The net income after the consideration of income deductions was $64,298 for the three months period to March 31, 1926, against a deficit of $149,741 for the three months period ended March 31, 1925.

Net Income Higher.—For the four months period ended April 30, 1926, the railway operating revenue of the Eastern Massachusetts Street Railway, Boston, Mass., was $3,335,607, against $3,274,637 for a similar period last year. The operating expenses fell from $1,971,149 to $1,941,691. The net corporate income carried to profit and loss is $344,092 for the four months period of 1926, compared to $299,821 for the four months period ended April 30, 1925.

Increase Scope of Service.—The British Columbia Electric Railway, Vancouver, B. C., has acquired the plant of the New Westminster Gas Company and will in future supply this commodity to the residents of the Royal City. The transaction marks the passing of one of New Westminster's early industries, although the plant will continue to be operated and will be improved. The gas works has about 12 miles of mains in New Westminster. A few years ago a plebiscite was submitted to the ratepayers for the purchase of the industry. The proposal carried, but the scheme never reached fruition.

Passenger Travel in Memphis Increases.—During the present year the number of passengers on the lines of the Memphis Street Railway, Memphis, Tenn., has been consistently increasing over the corresponding months of 1925. The increased riding, however, has not been sudden, as is indicated in a comparison of the months of December, November and October, 1925, with similar months of the previous year. The *Tri-Service News*, the official paper of the Memphis Power & Light Company, says the increase indicates that people are more and more acknowledging the street car as the most economical as well as safest and most convenient means of transportation in regular travel. Although the number of passengers has shown a considerable decrease over a period of about four years, the company hopes now that the tide has turned and that an improvement may be shown indicating larger patronage to the cars.

Applies to Abandon Two Branches.—The Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, has filed application with the Ohio Public Utilities Commission for permission to abandon the Amherst and Grafton branches of its railway. The Grafton branch runs from Elyria, Ohio, to Grafton and the Amherst branch from Penfield Junction to Amherst. The company claims these branches are being operated at a loss.

Toronto Loses Interest Appeal.—The city of Toronto lost its appeal in the first divisional court at Osgoode Hall in its effort to collect interest on the $500,000 deposited into court during the arbitration proceedings between the city of Toronto, Ont., and the Toronto Street Railway. The city of Toronto appealed against the decision of Mr. Justice Grant, who decided against the city's action to recover interest on the $500,000. The city appealed to the first divisional court at Osgoode Hall, and five separate judgments were delivered by their lordships on the bench. While separate judgments are being given, Chief Justice Mulock, Mr. Justice Hodgins, Mr. Justice Smith and Mr. Justice Ferguson all decided that the appeal should be dismissed.

Bids for Property on June 17.—The Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., has been granted permission by the Public Service Commission to abandon its lines and sell its property. The railway operates about 22 miles of line in the towns of Exeter, Hampton, Hampton Falls and Seabrook, N. H. Bids on this property will be receivable at once and acceptance of the highest bid or bids will be made on June 17 for the whole or any part of the equipment and rails. Bids must specify whether the offering party intends to junk the line or continue railway operation.

April an Encouraging Month.—For the first time this year the Oklahoma Railway, Oklahoma City, Okla., in April made more than enough money to pay its operating expenses, its taxes and its interest charges, according to the monthly report of W. C. Jones, auditor. There was a balance of $625 after paying expenses, the report shows. Increased freight revenues are helping to reduce the company's deficit, officials pointed out. The company is now making special efforts further to increase its revenues through freight service with the hope of being relieved from receivership as soon as possible.

Net Income Increases in Baltimore.—The net income of the United Railways & Electric Company, Baltimore, Md., during April of this year totaled $81,049, compared with $65,964 for April, 1925. For the first four months of this year the net income after fixed charges was $281,708 an increase of $63,340. Gross revenue in April was $1,421,965, compared with $1,414,058 for April of last year. Gross revenues for the first four months this year were $5,579,622 or $50,686 more than for the first four months of 1925. The operating expenses totaled $846,249, a decrease of $10,662.

Four-Mile Line to Suspend. — The Missouri Public Service Commission has authorized the Grand View Railroad, a 4-mile electric railway between the southern city limits of St. Louis and the Alpha Portland Cement Company's plant on the Lemay Ferry Road in St. Louis County, to discontinue and abandon the line. The property will be junked. The company reported an annual net deficit of $1,200 in 1924 and 1925 despite a subsidy of $3,000 from the cement company. This bonus was stopped on Jan. 1, last.

Book Reviews

Electric Railway Practices in 1925

A summary of the most significant features of presentations by electric railways to the Charles A. Coffin Foundation; edited by Henry H. Norris with an introduction by John N. Shannahan. American Electric Railway Association, New York. 233 pages, exclusive of appendices and index.

This volume is uniform with similar volumes published in 1924 and 1925. It places on record in detail the practices and methods of most general interest followed by the electric railways which competed last year for the Charles A. Coffin prize. The volume, like the others in the series, is well arranged and indexed. The chapter headings selected are twelve in number as follows: Furnishing Better Transportation Service; Improved Operating Practices; Getting Closer to the Public; Selling the Service; Advertising as an Aid in Selling Service; Recent Types of Cars and Buses; Improved Operating Practices; Recent Maintenance Methods; Improving Electric Railway Construction; Securing the Co-operation of Employees; Bettering the Accident Record; Electric Railway Financing.

The material presented in last year's briefs is of unusual value. While it was abstracted at length in the technical press shortly after the award, the reappearance of the material in book form in greater detail, with the information carefully collated and grouped under subject heads, gives another use for it.

As the Coffin competition for electric railways has more than established its value in stimulating interest in improvement, it might be worth while to consider somewhat more definitely than has been done in the past the fields being filled by this book and another with a somewhat similar name, also published by the association, namely, "Handbook of Modern Electric Railway Methods and Practices, 1925." If the latter is to be issued annually in the future, it might be well to see whether the titles could not be differentiated more than at present or the material combined in a single annual volume.

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Legal Notes

CALIFORNIA—*Leased Trucks Held to Be Common Carriers.*

Some truck owners leased their trucks to shippers at a certain daily rate, but with such other provisions as to the rate that the Public Service Commission held they were common carriers. As such, they came under the Auto Stage and Truck Act, which requires certain duties of such carriers. This contention of the Railroad Commission was upheld in spite of the fact that the trucks were not operating between fixed termini and over regular routes. [Holmes et al vs. Railroad Commission et al., 242 Pacific Rep., 486.]

CONNECTICUT — *Duty to Passenger in Perilous Position.*

The plaintiff was standing on the running board of a moving trolley car and was struck by a standing truck. In confirming the verdict for the defendant, the Supreme Court of Errors defined the duty of a railway to its passengers by quoting from the decision of the trial court, which said, in part: "A railway is not an insurer of passengers' safety, but must use the utmost care to avoid injury to such passengers that a reasonably prudent person would use under such circumstances." [Dwyer vs. Connecticut Co., 131 Atlantic Rep., 838.]

FEDERAL CIRCUIT COURT—*Contract of Street Railway to Pay Half of Cost of Maintaining Gates at Steam Railroad Crossing Has Consideration.*

A contract, by which a street railway company agreed to pay a steam railroad one-half of the cost of maintaining gates at the intersection of their tracks, will not be voided on the plea that the contract lacked mutuality or was without consideration. [Northern Ohio T. & L. Co. vs. Erie R.R., 8 Federal (2d) 962.]

FEDERAL CIRCUIT COURT—*That Private Interests Were Benefited or That They Defrayed Expenses of Relocating Highway Held Not to Affect Validity of Condemnation Under Right of Eminent Domain.*

A railway agreed with county authorities to donate certain land for a new highway and to build a large power station at a certain point if the authorities would abandon a portion of the old highway which obstructed the construction of the power station. The agreement was carried out, but the owner of some real estate which was condemned by the county commissioners brought suit on the ground that the change in location was dictated because of the benefit to private interests and so was a violation of the fifth and fourteenth amendments of the Federal Constitution. The Circuit Court of Appeals of the Sixth Circuit held, however, that the mere fact that private interests were served or that they defrayed in whole or in part the expenses of the relocation of the highway or other improvements would not affect the validity of the proceedings, and in this case the change in location was justified from the public interest. [Weaver vs. Pennsylvania-Ohio P. & L. Co., 10 Federal (2d), 759.]

FEDERAL DISTRICT COURT—*Intra-state Business of Interstate Bus Company Prohibited*

Greenfield, Mass., contended that it could do an intra-state business in Massachusetts without comp ying with the provision of the Massachusetts statute for the regulation of motor buses, but this was forbidden by the Federal District Court of Massachusetts. [Holyoke Street Railway vs. Interstate Buses Corporation, et al., 11 Federal (2d.), 161.]

FEDERAL SUPREME COURT — *Delay in Ending Confiscatory Rates May Constitute Confiscation*

In a case where a public service commission did nothing for two years to increase telephone rates after the Federal Circuit Court had reversed an earlier order of the commission, the Supreme Court said that "property may be as effectively taken by long continued and unreasonable delay in putting an end to confiscatory rates as by an expressed affirmance of them." [Smith et al. vs. Illinois Bell Te'ephone Co., 46 Supreme Court Rep., 408.]

FEDERAL SUPREME COURT — *Right of Interstate Railway to Abandon Unprofitable Intrastate Branch*

The Interstate Commerce Commission has power to authorize a railroad chartered by a state and engaged in both interstate and intrastate commerce to abandon a branch line located wholly within the state, when this line cannot be operated except at a loss. This authority arises from the power of Congress to free interstate commerce from unreasonable burdens. [State of Colorado vs. United States et al., 46 Supreme Court Rep., 452.]

FEDERAL SUPREME COURT—*Reasonable Return and Excessive Depreciation*

A pub'ic utility company, which because of excessive depreciation in the past has created a reserve depreciation account greater than that required adequately to maintain its property, cannot be compelled to apply a part of the property or money represented by such reserve to overcome a deficit in present or future earnings or to charge low rates which otherwise could not be sustained. The just compensation, safeguarded to a utility by the Federal Constitution, is a reasonable return on the value of the property used at the time that it is being used for public service, and the protection does not depend on the source of the money used to purchase the property. Past losses cannot be used to support a claim that present or future rates are confiscatory, nor can profits of the past be used to sustain confiscatory rates for the future. [Board of Pub. Util. Com. et al. vs. N. Y. Te!. Co. 46 Supreme Court Rep., 363.]

IOWA—*Doors Opened Before Car Stopped*

As a car was approaching the destination of a passenger he stepped in front of the door and the conductor opened it, although the car was still moving. In attempting to alight, the passenger fell and was injured. The court gave an extended review of decisions in similar cases and concluded in this case that the question of contributory negligence was a matter for decision by the jury. [Fitzgerald vs. Des Moines City Railway, 207 Northwest. Rep., 602.]

KANSAS—*Pedestrian Crossing Street Is Negligent if He Fails to Look for Car Approaching*

A pedestrian undertook to cross a street on which there were two car-tracks. He crossed the first safely, but while on the second track he was struck by a street car, which required 60 ft. to stop and which, as he stepped on the second track, was 30 ft. away and coming toward him at the rate of 20 m.p.h. His failure to look out for the approaching car was held to be negligent, as a matter of law, precluding a recovery. The fact that his attention was attracted to a car approaching from the opposite direction on the other track did not affect the case. [Ogden vs. Wilson et al., 243 Pacific Rep., 284.]

NEW JERSEY—*Injury to Alighting Passenger When Car Started without Warning After Unscheduled Stop.*

A car stopped at an unscheduled point because the road was temporarily obstructed by a truck that had been backed up against the curb. Several passengers got off. Then the defendant attempted to do so as it was near her destination, but as she was attempting to alight, the car was started, and she was injured. The question of the motorman's negligence is a proper one for settlement by the jury. [Scott vs. Atlantic City & S. Ry., 132 Atlantic Rep., 239.]

NEW YORK—*Motormen and Conductors May Be Examined by Plaintiff before Trial.*

Within the Civil Practice Act, Sec. 289, which permits the examination of "officers, directors, managing agents, or employees" of a corporation before trial, where their testimony is material and necessary to the plaintiff's case, the motorman and conductor of a street car may be so examined. [Enequist vs. Brooklyn City R., 214 New York Sup., 450.]

SOUTH CAROLINA—*Injury to Taxicab Attempting to Cross in Front of Two Cars*

A taxicab driver received a sign from the motorman of a trolley car on a city street to pass ahead of that car, but when he attempted to do so, he was struck by a trolley car coming in the opposite direction. The taxi driver was held negligent, but a judgment in favor of a passenger in the taxicab was affirmed, as there was some evidence of negligence by the railway. [Dozier vs. Charleston P. R. & L. Co., 131 Southeast. Rep., 592.]

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Personal Items

J. P. Griffin Active Vice-President of Texas Road

Important changes are announced in the personnel of the Texas Electric Railway, Dallas, Tex. Burr Martin, vice-president and general manager, has resigned, effective July 1. James P. Griffin has been given the title of active vice-president in charge of all operations.

Mr. Martin's withdrawal is due to slightly impaired health and a desire to retire from active business. He plans an extended trip to the Pacific Coast. Mr. Martin has been with the company more than fifteen years.

Mr. Griffin went to Dallas in July, 1905, with J. F. Strickland as secretary of the Texas Traction Company, an association engaged in the effort to build an interurban railway from Dallas to Sherman. This project was successful, and that line was put in operation on July 1, 1908, and Mr. Griffin served as secretary, also as general passenger agent and auditor. On April 1, 1912, he became also secretary of the Southern Traction Company, then building the interurban lines from Dallas to Waco and Dallas to Corsicana. These lines were put in operation in October, 1913. Mr. Griffin also served as general passenger agent for these lines.

On Jan. 1, 1917, the Texas Traction Company and Southern Traction Company were consolidated under the name of the Texas Electric Railway, and Mr. Griffin was elected secretary and general passenger agent of that company. On June 19, 1923, he was elected vice-president of the Texas Electric Railway.

Mr. Griffin was born at Waxahachie, Tex., on Jan. 28, 1881. He was graduated from the high school at Waxahachie in 1900 and took special work at the University of Texas in 1903. His first railway experience was in the general freight and passenger office at Waxahachie of a subsidiary of the Southern Pacific. He served in the General Land office of the State of Texas at Austin, Tex., from 1902 to 1904, and was secretary to Jack Beall, now president of the Texas Electric Railway, for one year while he was in Congress.

H. I. Gahagan has resigned as treasurer. This vacancy may be filled at the meeting to be held June 15.

A. J. Bush has resigned as local manager at Waco.

J. G. Hailey has resigned as electrical construction engineer, and he will be succeeded on July 1 by G. H. Peters as superintendent of power.

J. A. Wright has resigned as auditor. He will be succeeded by D. W. Milam, Jr.

M. R. Fewell will succeed Mr. Griffin as general passenger agent.

C. F. McAuliff, who is now purchasing agent, will have added the duties of chief clerk in the operating department.

H. G. Floyd will continue as superintendent of the Southern Divisions, Dallas to Waco and Dallas to Corsicana, being in charge of transportation, line and roadway. M. J. Loftus will continue as superintendent in charge of the Dallas-Denison Division, with duties similar to those of Mr. Floyd.

J. F. Layng and J. M. Stoddard on Missouri Road

John F. Layng, vice-president of the Buchanan & Layng Corporation, New York, has assumed the title of general manager for Receiver M. H. McLean of the Joplin & Pittsburg Railway, Joplin, Mo. As announced in the ELECTRIC RAILWAY JOURNAL for April 24, page 738, the Buchanan & Layng Corporation is making a report on the affairs of the railway, with the management of the road placed in the firm's hands. Mr. Layng temporarily assumes the title of general manager for the receiver during the period required to make the report and determine a plan of reorganization. As its resident representative on the ground the engineering firm has appointed J. M. Stoddard to the post of assistant general manager in charge of local operations of the company. Mr. Stoddard was formerly for twelve years superintendent and assistant to the general manager of the Long Island Electric Railway and the New York & Long Island Traction Company, Jamaica, N. Y., and later was general manager of the former company.

F. H. Daniels Heads Riley Stoker Corporation

Fred H. Daniels, general manager of the Riley Stoker Corporation, has been elected president to fill the vacancy resulting from the death of R. Sanford Riley; Aldus C. Higgins, vice-president, has been elected chairman of the board of directors, and James W. Armour, engineering manager, has been elected a member of the board of directors. The officers of the company are now as follows: President, Fred H. Daniels, Worcester, Mass.; vice-presidents, Aldus C. Higgins, Worcester, Mass.; William Pestell, Worcester, Mass.; R. T. Riley, Winnipeg, Manitoba; S. A. Armstrong, Toronto, Ontario; and secretary and treasurer, David K. Beach, Worcester, Mass. The board of directors of the company now consists of Fred H. Daniels, Aldus C. Higgins, William Pestell, David K. Beach, George N. Jeppson, Charles L. Allen, Henry S. Pickands, and James W. Armour.

Since the organization of the company in 1911 Mr. Daniels has been closely associated with Mr. Riley in connection with its affairs, having served respectively as secretary, general manager and vice-president. The company announces that the same policies and principles which have resulted in the company's growth under the leadership of Mr. Riley will be continued.

C. B. Frazer Made Superintendent of Traffic at Houston

Carl B. Frazer was recently appointed superintendent of traffic of the Houston Electric Company, Houston, Tex., succeeding C. A. Brann, who was transferred to the El Paso Electric Company.

Mr. Frazer has had a varied experience in public utility work and has been connected with companies under the executive management of Stone & Webster, Inc., for eight years. His first assignment was with the Columbus Electric & Power Company at Columbus, Ga., where he was a salesman in the commercial department. After serving in that capacity for one year he entered the accounting department of the company. Later he went to Cuba. There he was connected with a light and water company for approximately one year, but returned to the Columbus company as chief clerk. He next was transferred to the home office of Stone & Webster at Boston, Mass. After serving for nine months in the treasurer's office of Stone & Webster, Mr. Frazer went to the Haverhill Gas Light Company at Haverhill, Mass., as assistant treasurer, whence he went to Houston.

F. A. Jordan Promoted at Atlanta

F. A. Jordan, purchasing agent for the Georgia Railway & Power Company, Atlanta, Ga., for the past three years, has been promoted to the position of supervisor for purchases and stores. These two departments, although their work is closely connected, had previously been operated separately.

Mr. Jordan is a veteran of twenty years service with the Georgia Railway & Power Company. He became a member of the street mains department of the Atlanta Gas Light Company in 1907. Later he was transferred to the stores and purchasing department of the same company, and upon the formation of the Georgia Railway & Power Company he was assigned to the purchasing department. He became purchasing agent for the Georgia company in 1923.

Obituary

Eliseur S. Goodrich, president of the Hartford Street Railway and of its predecessor, the Hartford & Wethersfield Horse Railway, Hartford, Conn., for some 40 years prior to 1906, died in Wethersfield, Conn., on June 1. He was 91 years old last December. For many years Mr. Goodrich was also president of the Hartford & New York Transportation Company, which operated a steamboat line between New York and Hartford, but he retired from active connection with both companies upon their purchase by the New York, New Haven & Hartford Railroad. He did not, however, give up his personal interest in electric railroading at that time, and he was a regular attendant of annual conventions of the American Electric Railway Association long after he was 80 years old.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Business Conditions in May Improve Over 1925

Reports for the early weeks of May indicate increases in business activity as compared with the same weeks of 1925. Larger production of bituminous coal and beehive coke, larger awards for building construction, greater receipts of wheat and cotton, and a larger distribution of merchandise, as measured by car loadings, were reported during this period, compared with the corresponding weeks of 1925. Debits to individual bank accounts, indicative of the dollar volume of trade, were also running larger during the early weeks of May than a year ago. Wholesale prices continued to average lower than a year ago but the early weeks of May recorded an advance over the previous month. Business failures were running smaller in number than a year ago.

Loans and discounts of Federal Reserve member banks were declining in May, as compared with last month, but were well above last year. Prices of stocks averaged for the third week of May were higher than in the preceding week and a year ago. Call-loan rates for the same week were stronger than in any previous week during the month, being higher also than a year ago. Time-money rates showed the same comparison with the previous weeks and a year earlier, while the Federal Reserve ratio, averaged for the first three weeks, was higher than in the previous month but lower than a year ago. Loans on stocks and bonds to brokers and dealers by member banks in New York City continued to decline.

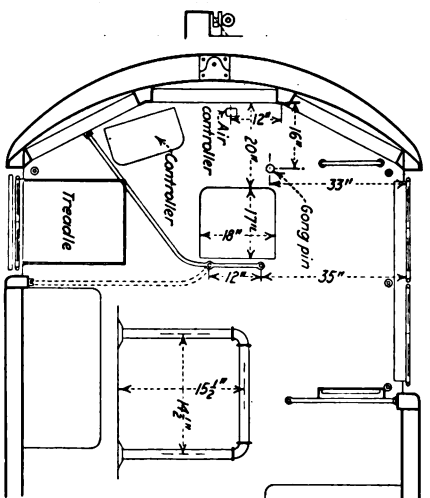
Six-Wheel to Exhibit Buses and Trucks

Exhibition of the new type parlor car body on the model 64 bus chassis will be made by the Safeway Six-Wheel Company of Philadelphia at the forthcoming convention of the Mechanical and Purchases and Stores Division of the American Railway Association at Atlantic City, June 9-16. New departures in the model 64 bus, which is designed either for high-class city or de luxe interurban touring service, are the street car type double jackknife folding front doors, arcade type of roof, permitting low appearance from the outside while allowing 75½ in. of headroom, and rear doors 31 in. on both sides. Five seats of the folding taxi type are installed at the rear. The right-hand rear door for baggage storage opens only to the outside. Balloon tires 38x9 are standard equipment.

In addition to the new bus model, the company has on exhibit its new model 57 truck chassis, suitable for city trucking service and particularly for long-distance operators, it is claimed. The Six-Wheel company believes that railways will become large users of this new truck. It has shown a speed of from 25 to 40 m.p.h. without injury to pay-load or highway, it was stated.

Improved Rear Exits for Dallas Cars

The Dallas Railway, Dallas, Tex., has ordered 30 one-man, two-man modified Peter Witt type cars from the American Car Company, St. Louis, Mo. As a new feature the rear doors of these cars are



Details of Improved Rear End of Dallas Car

to be treadle operated, this being added to speed up unloading and consequently the operating time of the cars.

General specifications are as follows:

Number of cars ordered	30
Name of road	Dallas Railway
Date order was placed	May 8, 1926
Builder of car body	American Car Co., St. Louis, Mo.
Type of car	One-man-two-man
Length over all	45 ft. 8¾ in.
Truck wheelbase	21 ft. 11½ in.
Width over posts	8 ft. 5 in.
Height, rail to trolley base	10 ft. 7½ in.
Body	All steel
Interior trim	Cherry, stained light
Roof	Arch
Air brakes	General Electric
Bumpers	Channels with flanges outward
Car signal system	Faraday buzzers
Car trimmings	Statuary bronze
Curtain fixtures	Curtain Supply
Curtain material	Curtain Supply, Wyndasote
Destination signs	Hunter No. 35
Door operating mechanism	National Pneumatic—rear doors treadle operated
Fare boxes	Johnson
Fenders	H. B. lifeguard
Heater equipment	Consolidated Car Heating double coil trussplank
Headlights	Golden Glow SM-95
Motors	Four GE-265, inside hung
Sanders	Nichols-Lintern materials preferred
Sash	Curtain Supply all metal
Seats	Reversible backs
Seating material	Birch slats
Step treads	Feralun
Trolley catchers	Keystone
Trucks	Brill 177-E-1
Ventilators	Railway Utility honeycomb
Wheels	26 in. diameter
Energy saving device	Economy meters

Need for Relief from Unwise Transportation Legislation Stressed

Using the illustration of over-regulation of traffic and all forms of transportation by national, state and municipal governments to show the need for industrial freedom from unwise legislation, Frederick P. Fish, honorary chairman of the National Industrial Conference Board, pointed out the manner in which the board has striven to overcome this tendency during its past ten years of existence. His talk was given on the occasion of the tenth anniversary meeting of the board, held at the Hotel Astor, New York, on May 20. Mr. Fish was one of the original founders of the conference board and has acted as its chairman up to the present time. The address was in the nature of a review of the manner in which the board has functioned and the objective to which it has striven during its existence.

While stressing the point that industry as a whole and the transportation industry in particular must expect a certain amount of legislative control of the proper kind and must, in fact, welcome this supervision as conducive to its own best interest, nevertheless too great control or legislation which does not consider the welfare of the public as a whole and provide fair treatment to its transportation agencies must be discouraged. Mr. Fish pointed out that the present traffic situation is intolerable in the larger cities of the country and that conditions will inevitably become worse before some means of betterment is found. In this connection, he believes that the proper interpretation of all facts dealing with transportation in general is of utmost importance and should be stimulated by railway and other transportation officials.

Today industry is far less individualistic, according to Mr. Fish, and the relationships existing between employer and employee have undergone a profound change from those of a few years ago. Employers have come to realize that they do not profit in the long run by refusing to their employees a comfortable living wage. Mr. Fish stated that the labor unions are valuable institutions as long as their function is to remain on watch against unfair treatment of labor, unsatisfactory working conditions, etc. In this function, he

Metal, Coal and Material Prices

Metals—New York	June 1, 1926
Copper, electrolytic, cents per lb	13.825
Copper wire, cents per lb	16.00
Lead, cents per lb	7.675
Zinc, cents per lb	7.30
Tin, Straits, cents per lb	60.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.675
Somerset mine run, Boston, net tons	2.00
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.20
White lead in oil (100-lb. keg), N. Y., cents per lb	15.00
Turpentine (bbl. lots), N. Y., per gal	$0.87

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believes that they are to be heartily co-operated with, but when they attempt to interfere with management, to restrain production and to endanger public welfare, Mr. Fish believes they should be strongly condemned.

The speaker suggested a comprehensive survey by some unprejudiced body or commission, examining into the very root and structure of industry throughout the country. In this way, with all sides playing fair, he believes that it will be possible to determine just what regulation is needed today. This study of industry should be made in the light of present conditions rather than those of 40 or 50 years ago, and the study should embrace not only business in general but transportation services as well. The speaker declared that the state legislatures and national government are recognizing the changed attitude which industry is taking in its relations with the public, the government and its employees, as well as its competitors. He pointed out that in former days the railroads and industry invited legislative attacks by the general attitude which they assumed. The attack was not slow in forthcoming and much damage was done to the general business structure before the uncompromising attitude which had caused the trouble was done away with.

The danger of a highly organized minority dominating an entire community was pointed out in connection with a reference to the recent coal strike and the often-threatened general railroad strike in this country. The experience which England has just gone through was cited to show that it is the duty of the American people to look forward and see what can be done to make impossible any such situation in this country.

Westinghouse Traction Appointments

T. J. Pace, director of sales for the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has announced the following appointments in the traction apparatus sales division of the company. In charge of the division is A. J. Manson, while in charge of the various types of traction sales are E. T. Wurts, heavy traction; E. A. Palmer, light traction; W. B. Bassett, propulsion; L. F. Brahmer, line material; A. B. Gibson, renewal parts, and E. P. Gooth, cost.

Rolling Stock

Birmingham Electric Company, Birmingham, Ala., is following, in its sixteen new cars, very much the design of the previous order. The principal differences are that the new cars will have rubber tile floors, metal sash and plush upholstered seats. A brief reference to this latest order was published in the issue of May 22, page 910. Some of the principal specifications follow:

Date order was placed	May 20, 1926
Date of delivery	Four months
Builder of car body	Cincinnati Car Company
Type of car	Closed passenger motor
Seating capacity	60
Weight (total)	35,000 lb.
Length over bumpers	49 ft. 7 in.
Length of body	48 ft. 7 in.
Width over all	8 ft.
Height, rail to trolley base	10 ft. 8½ in.
Body	Side entrance
Interior trim	Cherry
Roof	Turtle back type
Air brakes	Westinghouse straight air
Axles	Treated steel
Bumpers	Cincinnati Car Company pressed steel
Buzzers	Electric Service Supplies Company
Car trimmings	Brass
Conduits	Duraduct
Control	K
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fenders	H, B. lifeguards
Gears and pinions	G. E., treated
Hand brakes	Cincinnati Car Company
Heaters	Consolidated
Headlights	Electric Service Supplies Company
Headlining	Agasote
Journal boxes	Cincinnati Car Company
Lightning arresters	G. E.
Motors	G. E. 265
Paint	Duco
Registers	International
Sanders	Ohio Brass
Sash fixtures	National Lock Washer
Seats	Hale & Kilburn
Seating material	Plush
Side and center bearings	Cincinnati
Slack adjusters	American
Springs	Cincinnati Car Company
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	U. S. 20-C
Trucks	Arch bar, Cincinnati
Ventilators	Railway Utility Company
Wheels	Chilled iron, 26-in. diameter

Track and Line

Gary Railways, Gary, Ind., has started the reconstruction of a substantial part of the 15-mile interurban line between Gary and Valparaiso, Ind. The program calls for expenditures of approximately $37,000. It includes the rebuilding of the Woodville Junction bridge and several small trestles, the erection of five new outdoor passenger shelters and the laying of 10,000 creosote-treated ties. The work of laying a second track on Eleventh Street in Gary will soon be undertaken. Double tracking of a section ¾ mile long through Tolleston on the Gary-Hammond line was completed on May 28. In all reconstruction, the company is replacing the old 60-lb. rails with 90-lb. rails, installing creosote-treated ties and laying heavy gravel ballast.

Trade Notes

Edwin Besuden, for the past few months sales promotion manager for the Leon L. Wolfe Company, Cincinnati, Ohio, has severed his connections with that company. Most of Mr. Besuden's experience has been in the electric railway field. For more than eighteen years he was affiliated with the Jewett Car Company, Newark, Ohio, being sales manager twelve years of that time. Upon the retirement of this company from business he became associated with the Chicago Varnish Company as sales manager of its eastern territory, later acting in a similar capacity for the DuPont company after its purchase of the Chicago Varnish Company. While with the Leon L. Wolfe Company Mr. Besuden introduced Kemi-Suede, the new waterproof fabric manufactured by the Kemitex Products Company, Barberton, Ohio.

Taylor Electric Truck Company, Troy, N. Y., manufacturer of electric railway car trucks, railway car springs and springs for heavy vehicles, announces the appointment of L. W. Rolfe as sales manager. Mr. Rolfe formerly served in the same capacity with the Simmonds Machine Company of Albany, N. Y.

Francis A. Fox, formerly of the Griffin Wheel Company and more lately of the Yellow Truck & Coach Manufacturing Company, has joined the organization of the Mack-International Motor Truck Corporation, with headquarters in Chicago. Mr. Fox will co-operate with the various branches of the central division of this company in the sale of buses and trucks to the public utility and railway companies. The central division comprises eighteen states in the Middle West.

Francis T. West, who has been Western manager of the Watson-Stillman Company, with headquarters in Chicago, Ill., for the past 25 years, has retired. He has been succeeded by J. F. Coyne with offices at 549 West Washington Boulevard, Chicago. Associated with Mr. Coyne in the handling of the hydraulic machinery and accessory lines of the Watson-Stillman Company are James T. Lee and John O. Clark.

Bridgeport Brass Company, Bridgeport, Conn. has announced that H. Allen Faust, 915 City Center Building, Philadelphia, who has been covering the state of Pennsylvania, including the Philadelphia district and southern New Jersey, as salesman of brass pipe and tubular plumbing goods, has had Maryland, West Virginia and Washington, D. C., added to his territory.

Dr. R. H. Cunningham, widely known electrical engineer, has joined the Eisemann Magneto Corporation engineering staff. Dr. Cunningham has been identified with the automotive industry since its inception, except for a brief period 1917-1919, during which he occupied a post at Columbia University.

New Advertising Literature

American Car & Foundry Motors Company, New York, N. Y., has issued a leaflet entitled "Across the United States Every Eighteen Minutes." It describes the large mileage and world-wide adoption of Fageol safety coaches, and the manner in which these buses are being developed in line with best transportation practice and thought.

American Abrasive Metals Company, New York, N. Y., has just issued a new leaflet illustrating and describing a new design of safety car step. The use of Feralun anti-slip treads in connection with various step designs pictured is recommended by the company.

Economy Electric Devices Company, Chicago, Ill., has issued a leaflet telling of the purchase of 375 Economy watt-hour meters by the Philadelphia Rural Transit Company, Philadelphia, Pa. An extract from a paper by R. M. Horton president of the Philadelphia Rural Transit Company, which was delivered before the Society of Automotive Engineers in November, 1925, is included.

Roller-Smith Company, New York, N. Y., has issued supplement to Bulletin No. 530 dated May, 1926, covering Roller-Smith direct-acting time-limit attachments for standard type circuit breakers.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 67 New York, Saturday, June 12, 1926 *Number* 24

Mr. Nash Finds the Foundation Solid

DESPITE the growth of motor vehicle registration in the United States to approximately twenty million, and in the face of the unusual combination of difficulties produced by high operating costs on the one hand and limited income on the other, L. R. Nash, vice-president of the operating division of Stone & Webster, Inc., Boston, in an article in last week's issue of ELECTRIC RAILWAY JOURNAL declares that the $6,000,000,000 invested in the electric railway industry is in no danger of being wiped out. In fact, Mr. Nash maintains that the industry is just entering upon a new era of broadened activity and usefulness.

These views are based not on mere surface indications. They come from a man who is conservative in his viewpoint and a keen student and analyst of the fundamentals of utility operation.

Improvements in regulatory legislation and administration; development of fairer and sounder public thinking regarding the purposes and mechanism of local transportation franchises; a growing public appreciation of the unfairness of taxing car riders for the maintenance of paving to the profit of property owners; rapid crumbling of the barrier to progress represented by the fixed fare; a growing enlightenment regarding the proper basis for bringing about co-ordination of transportation service—these are among the more important underlying factors in the electric railway situation to which he calls attention. Although expressed in conservative language, Mr. Nash's summary of the situation is most encouraging. His facts are weighed with the careful precision of the scientist rather than played up for effect with the skill of the advocate. Mr. Nash dug down to fundamentals—and there he found the foundation solid.

Three-Phase Electrification Gives a Good Account of Itself

DISCUSSION of electrification in this country has sometimes indicated a tendency by some of those interested to become so absorbed in American conditions as to forget that progress has been made in other countries along lines quite similar to those here. While trainloads are considerably lighter in Europe, the use of the track is otherwise quite as intense as in America.

Last week an article appeared in this paper on the extension of the Austrian State Railways' electrified system in the Alps. This week an article is published giving the results of 25 years of electrification in Italy, a portion of which is just across the boundary from Austria. These are not minor installations. The Italian State Railways now operates or has under construction more than 1,000 miles of electrified trunk line railroad, and has in use or being built 686 electric locomotives totaling more than a million and a half horsepower.

Not a few Americans will be surprised to learn that the entire Italian electrification, save for a few experimental lines, has been carried out with the three-phase system. In this country three-phase operation has been counted out of consideration for many years. The Italian electrification has a mileage much greater than the longest American system. Continuous extension of the system indicates that it has given satisfaction under the conditions which are encountered in that country.

It is not to be inferred from the success of the three-phase system in Italy that it is suitable for use everywhere. It has its drawbacks, which the proponents of direct-current and single-phase operation are not slow to point out. But it cannot be gainsaid that in the situations where it has been employed it has given an account of itself which merits the attention of engineers whenever railroad electrification is discussed.

Wanted—A Railway at Its Best

BUSINESS grows through improvement of the product. Demand is built on desire. Saturation of the market for any product is overcome by tempting the customer through more attractive appearance, greater comfort and luxury, or, in the case of many products, improvement of the package in which the goods are sold. The automobile offers one of the most convincing illustrations of how effective is improvement of the product in stimulating buying demand.

The electric railway industry has been faced during recent years with what in some respects may be considered as a saturated market. Particularly in the smaller cities there has been experienced a serious recession in the demand for the product—street car rides. But at the same time the total demand for rides—for transportation—has increased at an astounding rate, largely due to the influence of the automobile. Under this same influence, also, the cost of transportation has been put on a new basis. Former standards have been entirely changed. There has come a widely expanded demand for quality in transportation. It remains for electric railways to improve their quality if they are to profit from the new market.

How can electric railway service be improved to meet the new conditions? The answer lies in the future. Attractive equipment, improved roadbed, speed, comfort, attention to the passenger—these are all factors in making a railway ride more marketable. Once the bounds of precedent are broken and the industry starts out seriously to exhaust the possibilities of improving service, then and only then will the limitations of the electric railway and the proper field for buses and other

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forms of vehicles become clear. Curbstone transportation experts have been predicting the end of street cars and interurbans. They have judged electric railways as they found them, but they have judged not an industry which was functioning to the limit of its possibilities. Their conclusions have been based on performance after a long period of strangulation and starvation, caused by restrictive political bickering on the one hand and arbitrarily limited revenue on the other.

In the removal of franchise restrictions and in the growth of a more liberal attitude toward fares, underlying obstacles toward progress are being removed. This throws on railway management the responsibility for determining the limit of the improvements which can be made in equipment and performance. Under present conditions there are few examples which could be construed as electric railway service at its best.

The Action of King Canute Was No More Futile than This

STANDING beside the water and commanding the tide to recede, King Canute made a gesture no more futile than that of the trainmen of the Boston & Worcester Street Railway in their attempt to prevent the operation of buses by that company. They have brought a bill in equity to prevent the receiver from carrying out his intention of operating buses between Boston and Worcester. They contend that such a move would deprive many so-called "blue uniform" men of employment. This action indicates a viewpoint quite as distorted as that of the courtiers of the ancient monarch who were of the opinion that the sea could be controlled by royal edict. Apparently they lose sight of the fact that transportation service is furnished to meet a public demand rather than to provide jobs for railway trainmen. In reality, however, it is only by doing their part in making railway service attractive and sufficiently profitable to justify its existence that they exercise the slightest influence over fundamental economic laws.

According to the contention of the employees, an agreement has been in existence with the company for many years regarding wages, hours of labor and working conditions. This agreement, it is said, provides also that any new form of transportation not covered therein shall be dealt with in conference between the representatives of the men and the company. The men say that this has not been done. To what extent they may be justified in criticising the carrying out of the agreement is open to argument, but to seek to restrain the substitution of buses for cars on the ground that it jeopardizes their employment is a move almost as ridiculous as the famous attempt to control the tide. Electric railway trainmen have in their hands a power which is a large factor in making the service profitable or otherwise. The extent to which they enter into the spirit of merchandising transportation will determine the future of many railway properties. Therein lies the protection of their jobs. The doctrine of no responsibility by labor for the financial success of the enterprise in which it is engaged falls down when the enterprise is in danger of being wiped out. When the goose is dead, court action won't bring back the golden egg.

Double Fares Needed by Buses in Berlin

EVIDENCE accumulates that under present conditions of operating costs mass transportation in our large cities can be conducted more economically by electric cars running on track than by buses. In a communication in the issue of this paper for April 24 Wilhelm Pforr of the Berlin street railway system took occasion to deny the report that there was to be a city-wide replacement of trolley cars by buses in Berlin, and gave among his reasons for this statement that, in addition to increasing street congestion, buses would require double the fare to supply the same service. By a coincidence, Mr. Pforr's communication was received for publication and printed in the same issue as Mr. Loree's unfounded declaration at Kansas City that the $6,000,000,000 of investment in electric railways in this country could be wiped off the books because the electric car had become obsolete through the advent of the bus.

Mr. Pforr's statement that a city-wide bus system in Berlin would have to charge double the present trolley fare in that city may have seemed a little exaggerated to some people. Nevertheless, it has been strikingly confirmed by some analytical studies of the cost of operation in Berlin by trolley cars and buses recently made by Dr. E. Giese, professor of transportation in the leading technical Hochschule in Berlin, and published elsewhere in this issue. Under like conditions of taxation and loading, this expert finds that the cost per passenger-mile by buses, including interest and depreciation on the investment, is practically twice that of the electric car, so that the fare would have to be twice as much.

It cannot be charged that Doctor Giese's analysis is unduly favorable to the electric car. For purposes of comparison of cost per passenger-mile he took double-deck buses and single-deck cars, though he made some allowance for the non-use of the upper deck seats of the bus in winter, because of inclement weather. On a passenger-mile basis such a comparison certainly favors the bus, although it is obvious that double-deck buses (or cars) cannot make as good time on the streets as single-deck cars (or buses). In his operating cost figures also Doctor Giese assumes the use by the buses of solid tires instead of pneumatics.

The final result of this study was that if buses were running in Berlin today instead of street cars, on the same basis of passenger capacity, the public would have to pay some $26,000,000 more annually in fares. The author grimly adds that the Berlin public cannot afford any such "luxuries."

Of course, it does not follow that the Berlin figures apply in their entirety to the United States. Some of the items of expense of both car and bus would be different. The cost of fuel for the bus would probably be lower here, but it might well be that transportation wage cost, because of the smaller capacity of the bus, would be higher here, where the wages for platform men are much larger. Corresponding figures for typical American cities prepared by experts on railway and bus operation and based on actual performance would be very much worth while.

The need for such definite information is shown in the present discussion in New York City, where the municipal purchase of certain existing trolley lines is

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being suggested so that these lines may be removed and the streets which they occupy "cleared for traffic." At the hearing on June 10 the Mayor was even quoted as saying, "I have heard of no one in public life or out of it that did not admit that the greatest cause of traffic congestion was the street car lines and that the greatest boon would be the elimination of these lines."

No one seems to consider that the buses which are being urged as a substitute for cars would themselves occupy a certain amount of street space. Whether the roadway area required per bus passenger actually would be greater or less than that per car passenger would depend on the types of vehicle under consideration. In actual practice such comparisons have always shown the street car to be a more economical user of street space than is the bus. Moreover, it is worth remembering that in London, where the buses are handling heavy traffic, their speed is much less than that of the tramways. In New York City itself the slow speed made by buses on Fifth Avenue is an example of what may be expected when these vehicles are used to handle heavy traffic on congested streets.

Unquestionably, there is a large field for the bus in this country, but it is a mistake to jeopardize its future by unwise attempts to substitute buses for electric cars at low fare levels. Neither considerations of economy nor traffic efficiency justify such a change.

Some People Deliberately Close Their Eyes to Economic Facts

BACK in the happy days before the World War it was possible for the residents of a certain suburban community to reach the business district of the adjacent town by street car for 5 cents. Rising costs gradually forced the fare up to 6 cents, 7 cents, and finally 8 cents. More recently the electric railway has revised its rates to permit a local ride in either community for 5 cents, while the cost of a through ride has become 10 cents.

Great is the indignation of a group of the suburbanites. A majority of them use the street car only twice a day, morning and night, but they are objecting vociferously to the increased fare which they have to pay. They have appealed unsuccessfully to the state regulatory body asking that the fare limit be abolished and the through rate restored to the original 5 cents. They have tried to boycott the street cars by extensive use of private automobiles. That attempt was not a marked success. They wished to establish a competing bus service which they hoped could be operated at a 5-cent fare, but found that such duplication of facilities was contrary to law.

Now they believe that a way out of the difficulty has been found. This group of people is considering the organization of a club and the purchase of a bus to take the club members to and from their work every day. By this subterfuge they would avoid the legal objection to the operation of competitive bus service. Because they do not all wish to go and come at exactly the same hour it would be necessary for the bus to make two trips in the morning and two trips in the evening. Hence it would be necessary to hire some one to operate it. During the middle of the day there would be nothing for the bus or its driver to do. Garage space would be required for its storage during those hours as well as for its protection at night. In other words, the club would have to organize a complete little transportation system of its own.

How such a transportation system with limited traffic in the rush hours and none at all during the day could be operated cheaper than the established agency is difficult to see. When, and if, the plan ever is put into effect, the members of the club are likely to have a rude awakening concerning the 5-cent fare. Just what will happen when their single bus must be overhauled or when it breaks down is a matter of conjecture. Probably they will be compelled to resort to the service of the old reliable street railway, which charges them 10 cents for a fast, safe, comfortable ride of several miles and provides service day and night, winter and summer, for all who wish to avail themselves of it.

No Longer Is a City a Single Focal Center

GROWTH of our cities has brought many changes in recent years, not the least important of which is the process of decentralization that has created numerous sub-centers instead of the former single focal center. Not so long ago the average city resembled a series of concentric circles with commerce and industry occupying the central zone while urban, suburban and rural residential districts were grouped around it. Gradually the business area expanded and encroached on the urban residential district. The latter spread outward into the suburbs and the net result was the creation of larger circles arranged in the same general way as before.

Now it has become evident that this method of development has certain serious disadvantages. It lengthens the average distance between home and place of employment, and multiplies the number of rush-hour users of transportation facilities. Congestion is vastly increased on the transit lines and on the streets. Great economic waste results from the alteration in the character of neighborhoods and the destruction of one set of buildings to make room for a new set, different in type, but not necessarily better. Utility services to meet the changed conditions can be provided only at high cost, and usually they lag far behind the demand.

To offset these disadvantages it must be admitted that there is a certain gain in efficiency by geographical concentration of such business enterprises as require frequent contact with each other. If, for example, as the result of decentralization, every merchant had to travel 2 or 3 miles to see his banker, commerce and trade would soon be seriously hampered.

The problem, therefore, is so to arrange the city that those businesses and industries which need to be close together can enjoy that advantage, while those which can function equally well in other localities are distributed throughout the city with residential areas in between. It is clear that two things are necessary to accomplish this. A comprehensive civic plan must be prepared after thorough investigation of all the complicated details of the question. Municipal officials must have adequate legal authority to enforce the plan after it has been made up. Definite establishment of the character of a neighborhood may be anathema to the real estate speculator, but it is a real boon to the ordinary property owner, and will greatly facilitate the utility companies in providing adequate and satisfactory service.

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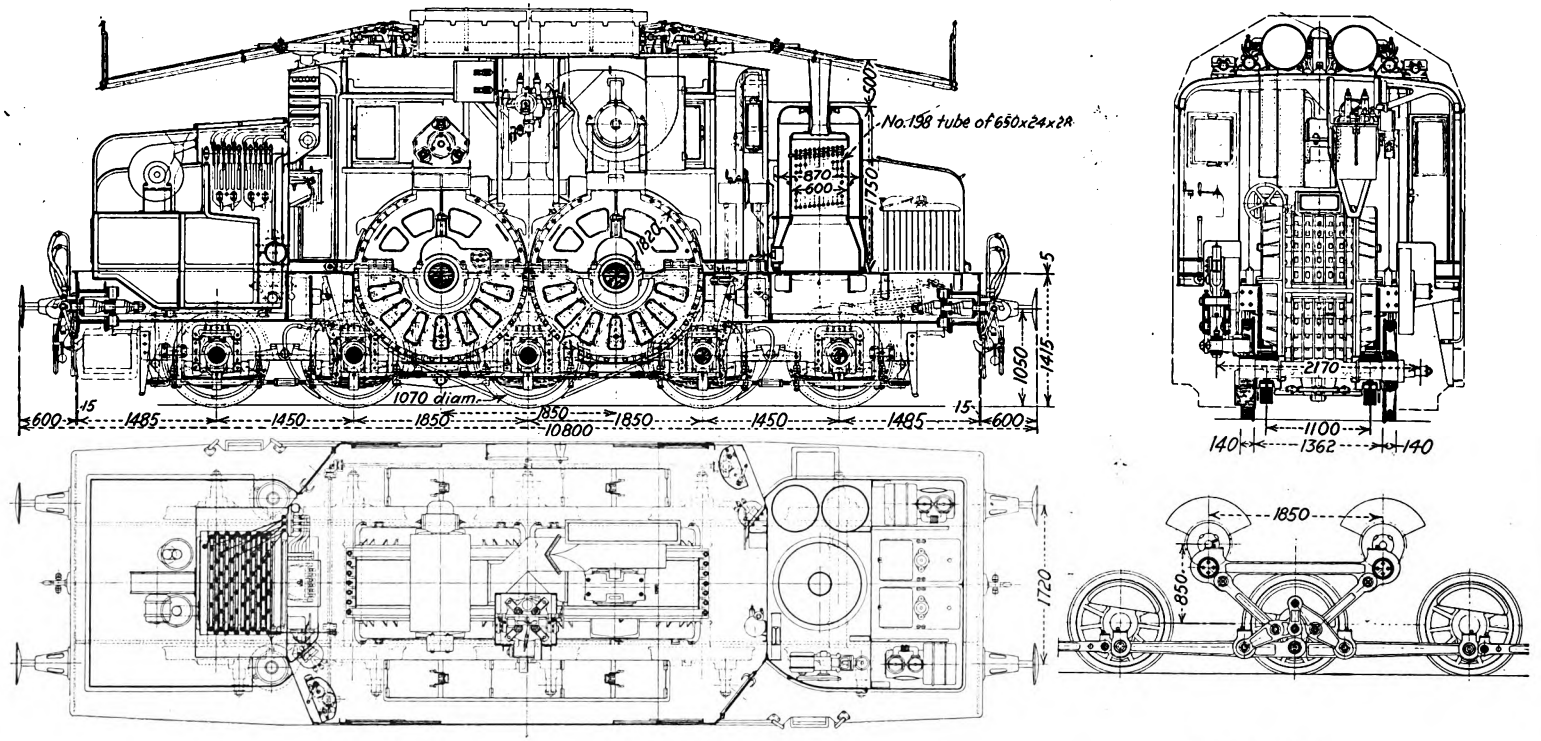
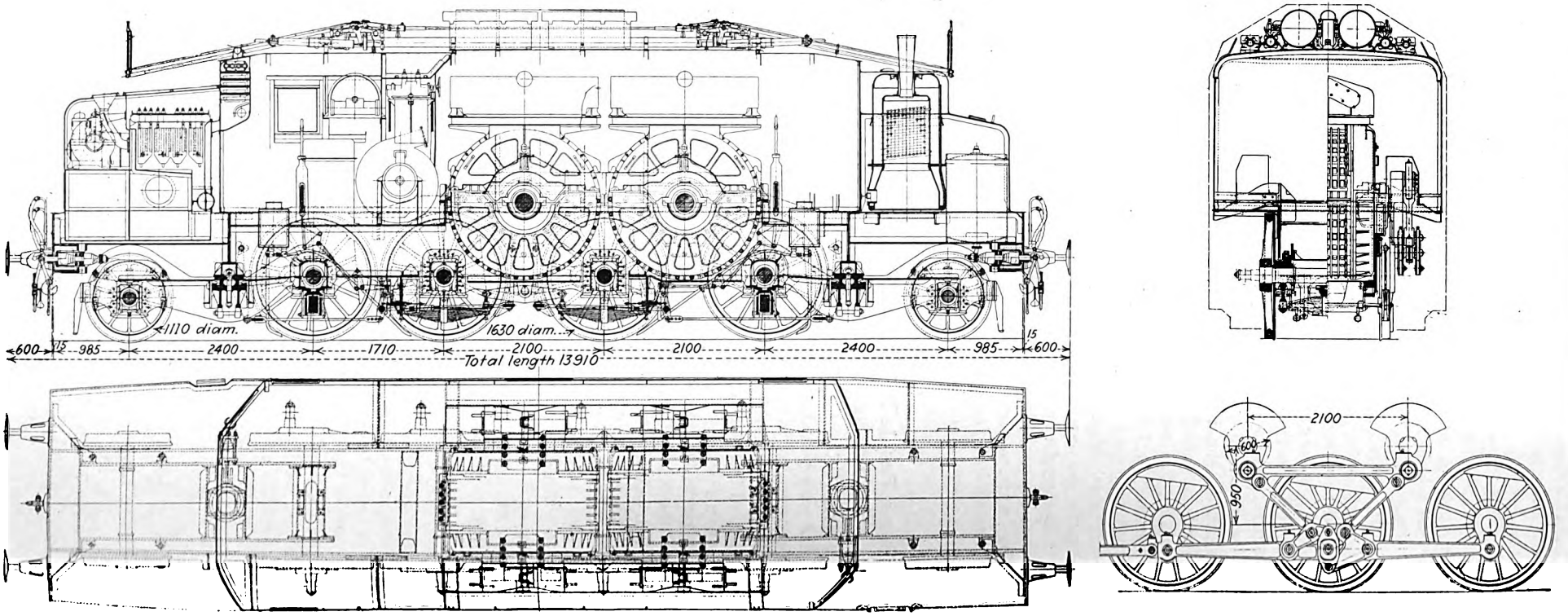
Latest Developments in Three-Phase Locomotives for the Italian State Railways

At top, a new type of freight and passenger locomotive now under construction for mountain lines. A special type of side rods similar to those of the E-330 type is used.

Below, a new type of passenger locomotive under construction. Several improvements have been made over the E-331 type.





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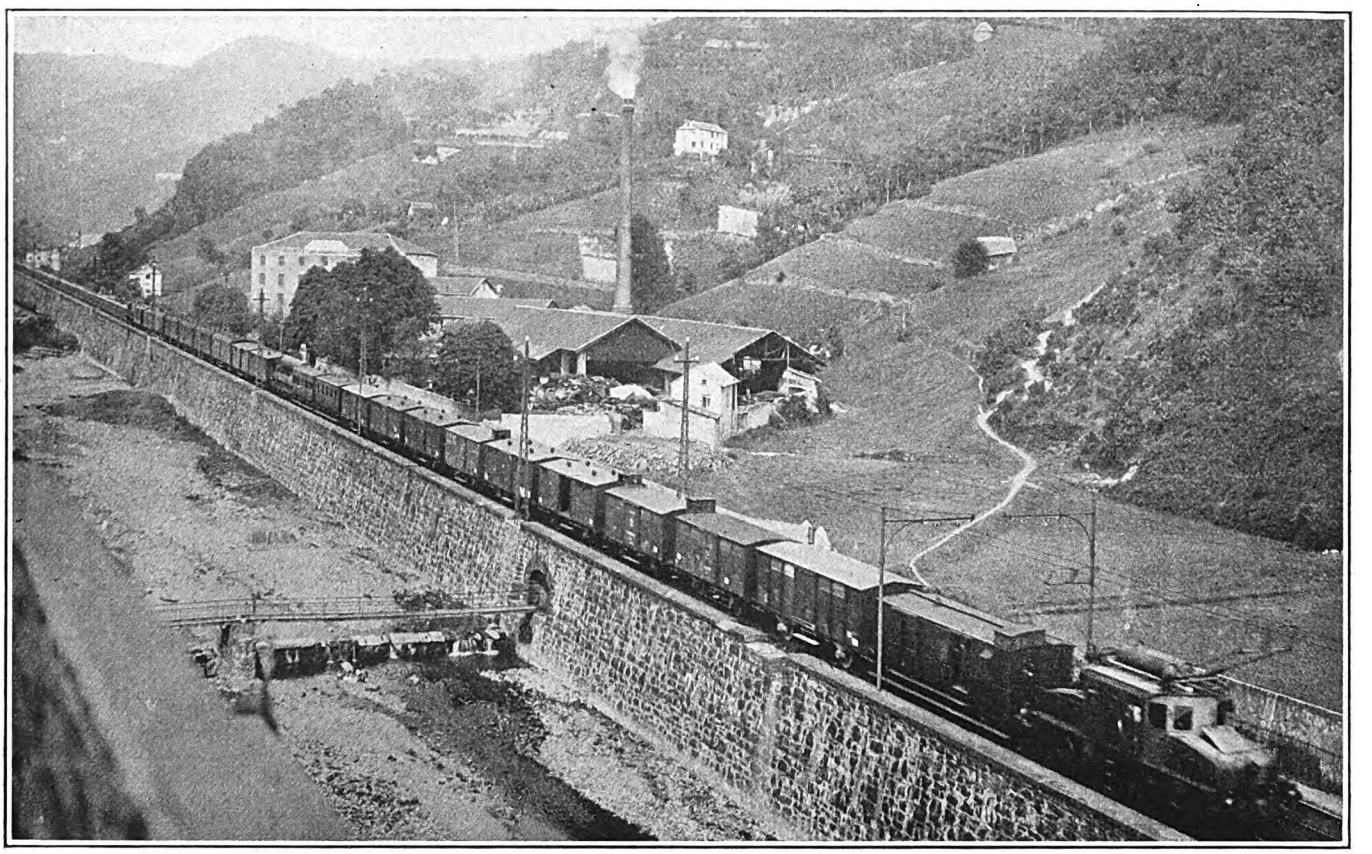
25 Years of Electric Operation in Italy

Three-Phase System Has Given a Good Account of Itself and Has Greatly Increased Capacity of Italian State Railways—System Is Being Extended and 3,000-Volt Direct-Current Lines Are Being Built Also

By Giuseppe Bianchi
Chief Mechanical Engineer Italian State Railways



The Lower Giovi Line Handles Heavy Freight. The 400-Ton Train Shown Is Ascending a 3.5 per Cent Grade at 31 M.p.H.

SINCE electric operation was first inaugurated on Italian steam railways in 1901, its use has been extended gradually but steadily until today 859.6 km. (533 miles) of line are in operation by electricity. In addition there are 836 km. (518 miles) of line in course of electrification. It is planned to extend the list of projected electrifications so that some 2,000 km. (1,250 miles) of main lines will be included. Conversion of these lines is a matter of great economic importance, since in addition to increasing the efficiency of operation it will make possible the use of large amounts of hydro-electric energy, thus greatly reducing the purchase of coal abroad, on which Italy is entirely dependent.

Installation of the first electric railway was suggested by a government commission in 1898; soon afterward experiments were started to try out the various systems of electric traction then available. In 1899 between Milan and Monza and between Bologna and San Felice self-propelled cars with accumulators were placed in service and in 1901 a third-rail system, similar to the ones which appeared at that time in America, was placed in operation between Milan and Varese.

On the Lecco-Colico-Sondrio and Colico-Chiavenna lines, however, it was decided to try an electric system which would permit heavy passenger and freight trains and would afford as regular service as the steam traction at a lower cost of operation.

Although a heavy train service with a third-rail system had already been built in America (the Baltimore tunnel was electrified in 1895) at that time it was not believed that this system would be suited for a line 106 km. long with 2 per cent grades, so it was decided to use an alternating-current system of the type used on the Lugano street cars (1896) and the Burgdorf-Thun Railway (1898) in Switzerland. Instead of the 750 volts used on these lines, 3,000 volts was chosen, as results of experiments made at that time made it appear impossible to collect from a single trolley more than 300 amp., which would not have been enough for the 1,500 hp., 80 per cent power-factor locomotives which were necessary for hauling the trains planned for the Valtellina lines.

On account of the reactive effect and because at that time direct drive between motors and drivers was in use, the a.c. 16-cycle system was believed to be more suitable and therefore was adopted.

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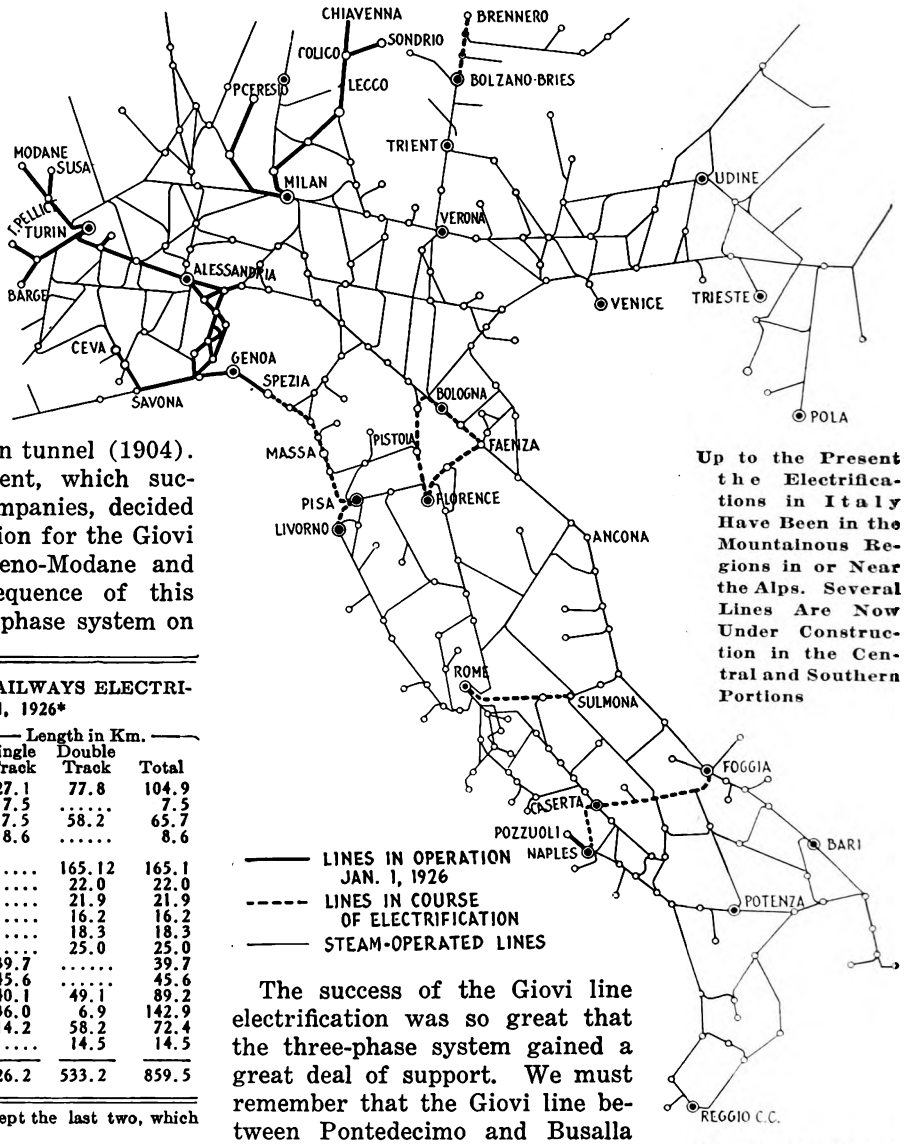
With the adoption of this system, a number of difficulties came up in connection with the speed regulation of the three-phase motors, the trolley and contact lines, the controllers, the mechanical transmission of power between the motors and drivers, the rheostats, etc. These all required a great deal of experimenting and study before they could be satisfactorily solved. The experiment, started in 1901, was, however, satisfactorily solved by the end of 1903. Up to that time the passenger service was handled by single motor car units.

In the year 1904 the first electric locomotives were put in service. These were of the 1-C-1 type, weighing 64 tons, with Scotch yoke drive from two motors with series-parallel connections, giving 32-64 km. per hour with 3,500-6,000 kg. tractive effort.

This type of locomotive gave such good results that the Swiss Government decided to adopt the three-phase system for electrification of the Simplon tunnel (1904). The Italian State Railway management, which succeeded the various private railway companies, decided to adopt the same system of electrification for the Giovi line and for the Savona-Ceva, Bussoleno-Modane and Bologna-Florence lines. As a consequence of this decision, an extensive use of the three-phase system on the Italian Railways began, which caused much discussion in the succeeding years. However, it must be remembered that at that time (1904) comparative data about the best system of electrification were not available as they are today. The single-phase system was then in its early development stages and the high-voltage d.c. system was not in existence.



Up to the Present the Electrifications in Italy Have Been in the Mountainous Regions in or Near the Alps. Several Lines Are Now Under Construction in the Central and Southern Portions

The success of the Giovi line electrification was so great that the three-phase system gained a great deal of support. We must remember that the Giovi line between Pontedecimo and Busalla has grades up to 3.5 per cent and the Giovi tunnel (3,258 m.) has a 2.9 per cent grade.

These steep grades made steam operation extremely difficult; with the best mountain steam locomotives (series 470, ten coupled, 75 tons on drivers) the trains hauled were: 170 tons with one locomotive at 25 km. per hour, 310 tons with two locomotives at 25 km. per hour, and 450 tons with three locomotives at 25 km. per hour.

TABLE I—LINES OF THE ITALIAN STATE RAILWAYS ELECTRICALLY OPERATED AS OF JAN. 1, 1926*

Line	Length in Km. Single Track	Double Track	Total
Modane—Bardonecchia—Bussoleno—Turin	27.1	77.8	104.9
Bussoleno—Susa	7.5	.....	7.5
Turin—Pinerolo—Bricherasio—Torre Pellice—Barge	7.5	58.2	65.7
Trofarello—Chieri	8.6	.....	8.6
Torino—Alessandria—Novi—Ronco—Genova (Via Busalla)	.....	165.12	165.1
Ronco (Via Mignanego)—Quadrivio Torbella	.....	22.0	22.0
Alessandria—Tortona	.....	21.9	21.9
Tortona—Voghera	.....	16.2	16.2
Tortona—Novi	.....	18.3	18.3
Tortona—Arquata Scrivia	.....	25.0	25.0
Sampierdarena—Savona	39.7	.....	39.7
Savona—Ceva	45.6	.....	45.6
Genoa—Spezia	40.1	49.1	89.2
Monza—Lecco—Colico—Sondrio—Chiavenna	136.0	6.9	142.9
*Milan—Rho—Gallarate—Porto Ceresio	14.2	58.2	72.4
*Naples—Pozzuoli	.....	14.5	14.5
Total	326.2	533.2	859.5

*All lines are three-phase, 16-cycle, 3,600-volt a.c. except the last two, which are 650 volts d.c.

TABLE III

Electric locomotives in operation on the Italian State Railways as of Jan. 1, 1926

Three-phase, 16-cycles, 3,600-volts Wheel Arrangement	Number
0—E—0	384
1—C—1	62
2—C—2	24
1—D—1	37
Total	507

*Three-phase, 45-cycles, 10,000-volts Wheel Arrangement	Number
0—E—0	4
1—D—1	24
Total	28

Direct current, 650-volts Wheel Arrangement	Number
B+B	1
C+C	5
1—C—1	10
Total	16

Electric locomotives under construction

Direct current, 3,000-volts Wheel Arrangement	Number
B+B+B	63

Direct current, 650-volts Wheel Arrangement	Number
1—C—1	20
C+C	12
Total	32

Three-phase, 16-cycles, 3,600-volts Wheel Arrangement	Number
0—5—0	26
1—D—1	14
Total	40

Grand total	551
Grand total	135
Total hp. of electric locomotives in operation	1,220,000
Total hp. of electric locomotives under construction	320,000
Total	1,540,000

*In service on 16-cycle lines.

TABLE II—LINES OF THE ITALIAN STATE RAILWAYS IN COURSE OF ELECTRIFICATION

Line	Length in Km. Single Track	Double Track	Total	Type of Supply Phase	Cycles	Volts
Spezia—Pisa	...	75	75	3	16	3,600
Pisa—Livorno	...	19	19	3	16	3,600
Florence—Pistoia—Bologna	93	39	132	3	16	3,600
Rome—Avezzano—Sulmona	172	...	172	3	45	10,000
Benevento—Foggia	102	...	102		D.C.	3,000
Benevento—Caserta—Naples	97	...	97		D.C.	3,000
Florence—Faenza	101	...	101	3	16	3,600
Faenza—Bologna	...	49	49	3	16	3,600
Bolzano—Brennero	...	89	89	3	16	3,600
Total	565	271	836			

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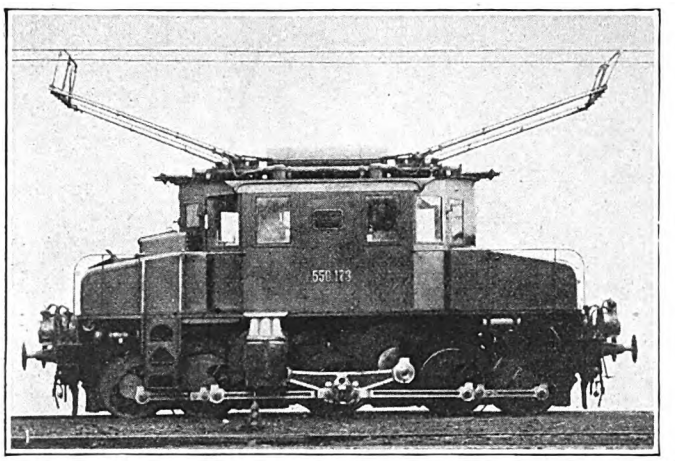
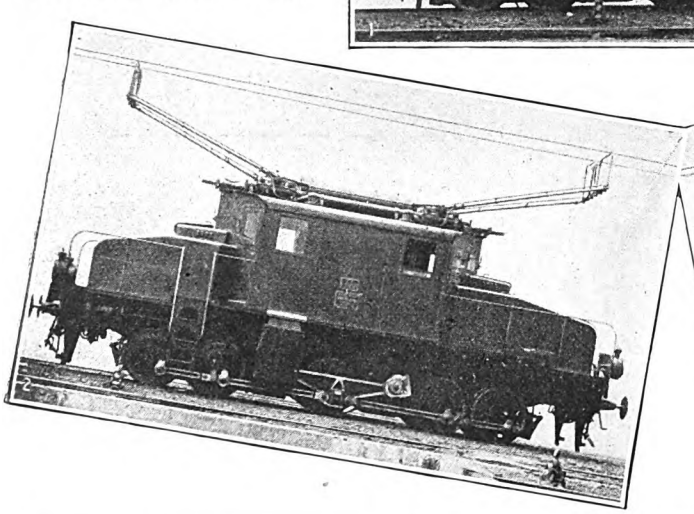
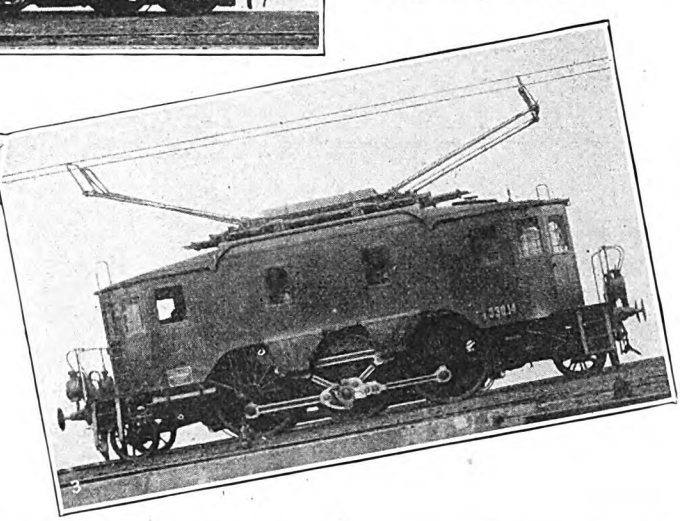
The weights of the trains hauled by the first Giovi electric locomotives (series E-550, ten coupled, 60 tons on drivers, 2,000 hp., of the type shown in Fig. 1, were: 260 tons with a single locomotive at 50 km. per hour, 470 tons with two locomotives at 50 km. per hour, 600 tons with three locomotives at 50 km. per hour.

By replacing the steam with electric operation on the Giovi line the following advantages were obtained:

1. The speed was doubled.
2. The distance between trains was shortened on account of more constant speed.
3. There was better utilization of the locomotives and crews.
4. Increased tonnage of trains was obtained.



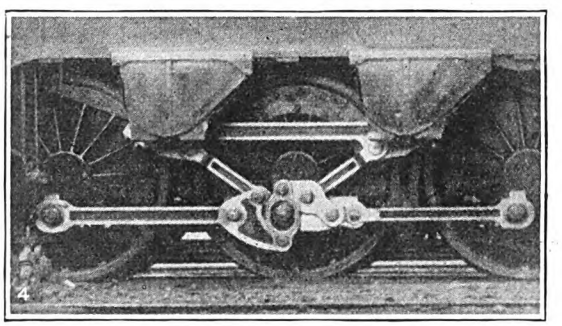


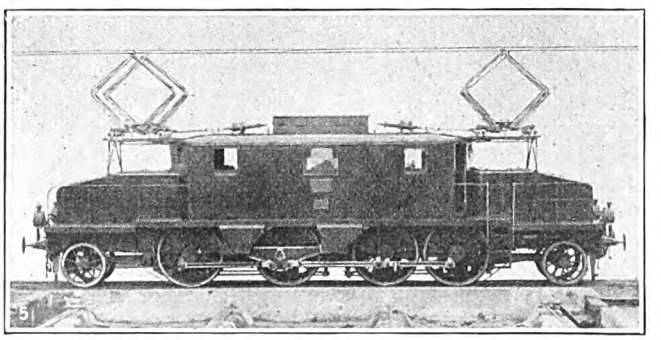


Typical Locomotives of Italian State Railways

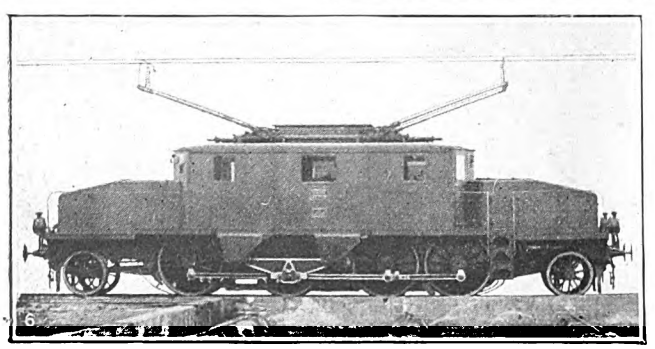
All are three-phase, 3,500-volt machines

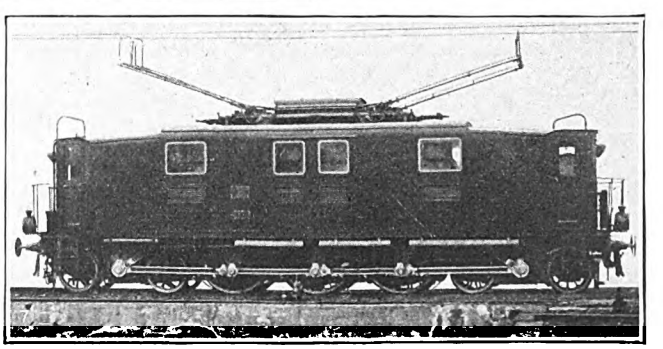
1. Type E-550 locomotive, of which 185 were built between 1911 and 1917. They weigh 64 tons, all on drivers, and have a rating of 2,000 hp. at speeds of 25/50 km. per hour (15.5/31 m.p.h.).
2. This locomotive is similar to the E-550 type but is more powerful, being rated at 2,000 kw., the weight being 74 tons. Between 1920 and 1925, 186 of these were built.
3. Type E-330 is a four-speed passenger locomotive rated at 2,000 kw. Sixteen of these are now operating. The speeds are 37-50-75-100 km. per hour (23.3-31-46.5-62 m.p.h.).





4. Detail of the articulated drive of the E-330 locomotive shown in No. 3.
5. Passenger locomotive type E-431, rated 2,000 kw. with four speeds similar to the E-330 type. Of this type 37 were built between 1920 and 1924 and are in service between Genoa and Turin.
6. Type E-331 locomotive. This is a recent design with the same electrical characteristics as the E-330 type.
7. A passenger locomotive designed for 45 cycles, 10,000 volts. The apparatus is nearly the same as on the 16-cycle machines, but there are in addition line transformers and a gear reduction is provided between the motors and the auxiliary axles.





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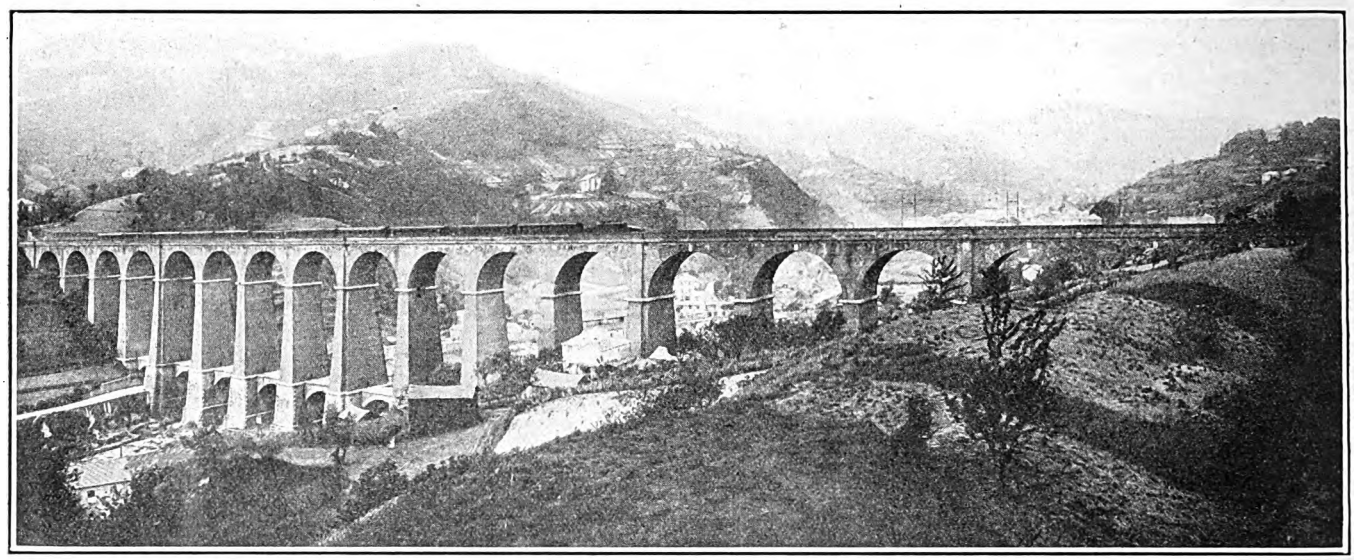

On the Upper Giovi Line. A 350-Ton Passenger Train Is Going up a 2 per Cent Grade at 47 M.p.H.

5. There was greater regularity and safety for trains going down the grades, as the regeneration of current allowed them to go down without brakes, with the result of reducing wear on wheels or rails.

6. The coal consumption, which in steam operation was about 86 grams per virtual ton-kilometer, was reduced to 50 grams at the electric generating plant.

Electrification of the Giovi line was regarded as the most satisfactory solution for mountainous railway operation with steep grades and heavy traffic. The Italian State Railways in 1911 decided to apply the same system of electrification to the following lines: Bussoleno-Modane, Savona-Ceva, Sampierdarena-Ronco, Monza-Lecco, Turin-Pinerolo, Sampierdarena-Savona.

In 1915, on account of the war, all work for the new electrifications was suspended. The enormous difficulties of steam railway operation in Italy during the war period, owing to the deficiency and bad quality of coal (the price of which reached 500 lire, or $20 per ton) were very serious and pointed out the advisability of a careful study. Coal saving on the 435 km. (272 miles) of electrified lines up to 1918 was about 170,000 tons per year, corresponding to 85,000,000 lire ($3,400,000).

The question of which would be the best system for use on the new lines to be electrified was largely discussed and the advisability of using power from the existing plants and the great progress made by the d.c. 3,000-volt electrification system suggested a tryout with a 42 or 50-cycle, 10,000-volt, three-phase system and with a d.c. 3,000-volt system.

Table I gives the lines electrically operated in Italy as of Jan. 1, 1926; Table II gives the lines in course of electrification, and the map indicates the location of the above lines; Table III shows the number and types of electric locomotives in service and under construction as of Jan. 1, 1926.

Operating expenses of the 15,625 km. (9,800 miles) of steam railway and of 631 km. (394 miles) (for the Piedmont and Liguria regions) electrically operated lines for the year 1924-1925 are shown in Table IV.

The unit used in these tables is virtual ton-kilometer. This unit was obtained from the following formula:

$$L_v = L_r + \frac{h + \Sigma pl}{5}$$

where

L_v = virtual length in kilometers.
L_r = real length in kilometers.
h = difference of level in meters between two points
l = length of curves in kilometers.
p = coefficient of the radius of the curve.

The p coefficient assumes the following values:

Radius of curve in meters	1,000	900	800	700	600	500	450
Values of p	0.5	0.6	0.8	1.0	1.2	1.5	1.7
Radius of curve in meters	400	350	300	250	200	180	..
Values of p	2.0	2.4	2.8	3.4	4.2	4.5	..

These virtual ton-kilometer units which have been used by the Italian railway companies since 1880, while they provide a measure of work done on the steam operated railroads, do not take into consideration the energy returned to the system by electrically operated railway trains when regeneration is used on down grade runs.

From the data of Table IV the economic possibilities of electric railway operation in Italy may easily be seen.

TABLE IV—COST OF STEAM OPERATED (15,626 KM.) AND ELECTRIC OPERATED (630 KM.—PIEDMONT AND LIGURIA REGIONS ONLY) LINES DURING PERIOD JUNE, 1924, TO JUNE, 1925

STEAM
- Real run of locomotive, train kilometer..... 134,986,121
- Real run of locomotive switching, hours..... 3,979,197
- Real run of hauled axles, kilometer..... 4,445,000,000
- Hauled ton—kilometer: virtual, kilometer.. 45,180,632,300; real, kilometer..... 35,105,386,400

ELECTRIC
- Real run of engine, train kilometer..... 11,175,193
- Real run of engine switching, hours..... 37,976
- Real run of hauled axles, kilometer..... 429,161,000
- Hauled ton—kilometer: virtual, kilometer... 5,044,547,000; real, kilometer..... 3,384,394,900

	Cost in Lire		Cost per Ton-Km.	
	Total	Axle-Kilometer	Virtual	Real
Personnel	418,016,459	0.07895	0.00777	0.01000
Fuel	545,647,602	0.11114	0.01093	0.014 7
Oil	15,722,296	0.003 8	0.00030	0.00039
Maintenance	269,593,515	0.05397	0.00531	0.00683
Pumping plants and water	6,414,182	0.00130	0.00013	0.00016
Interest and depreciation charges	87,002,000	0.01865	0.00183	0.00236
Total	1,342,396,054	0.26709	0.02627	0.03381

	Cost in Lire		Cost per Ton-Km.	
	Total	Axle-Kilometer	Virtual	Real
Personnel	41,747,632	0.09272	0.00789	0.01175
Oil	1,269,432	0.00292	0.00025	0.00037
Maintenance: Locomotives	11,346,147	0.02602	0.00221	0.00330
Maintenance: Electric plants	2,898,900	0.00656	0.00056	0.00083
Interest and depreciation charges	61,580,578	0.13982	0.01190	0.01773
Electric energy	13,482,590	0.03057	0.00260	0.00388
.....	.....	.....	.....	.....
Total	131,325,279	0.29861	0.02541	0.03786

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The cost for a traffic unit, that is to say one virtual-ton-kilometer, for the electrically operated lines is less than for the steam operated lines. The cost of coal in Italy is now between 180 and 200 lire ($7.20 to $8) per metric ton, while the average cost of electric energy for railway purpose last year was only 0.13 lire (0.52 cent) per kilowatt-hour.

The cost for transmission lines, substations and feeders, is about 500,000 lire ($20,000) for each kilometer of a double-track line, and the cost of an electric locomotive for passenger traffic (2,000 kw., 90 tons) is about 1,400,000 lire ($55,000).

These conditions are most favorable for electric railway operation, and a study for a more extensive electrification is now under consideration.

It is worth while to point out that the electrification of about 2,000 km. of main lines which are now steam operated will reduce by 40 per cent the present coal consumption for railway use which totals about 2,500,000 tons per year. This reduction in coal consumption will be of great importance due to the scarcity of coal in Italy.

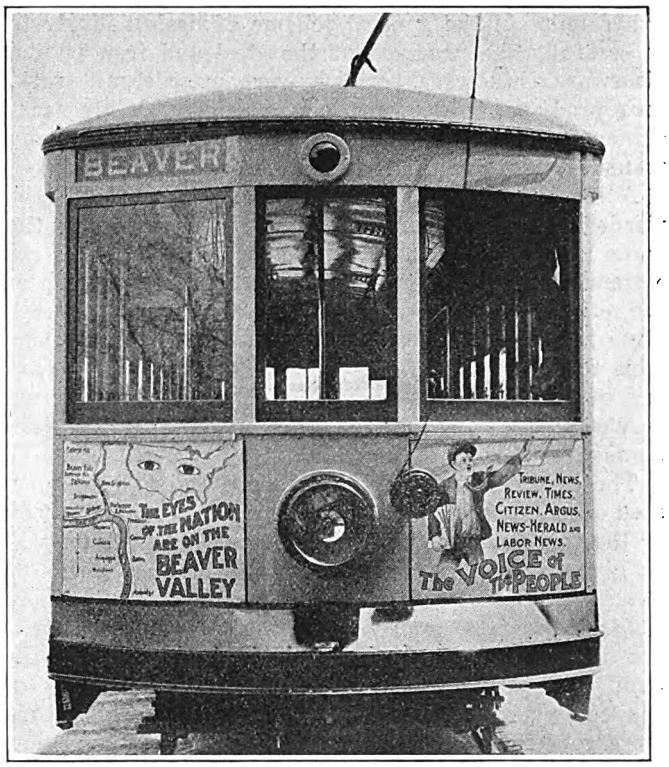
It is not possible to state at this time how many years it will take for the full realization of this program, as it mainly depends on how soon the new hydro-electric plants can be built. However, from the results so far obtained by the operation of electric lines and the improvements which are continually introduced it may confidently be said that the most efficient and economical way to solve the problem of transportation in Italy lies in this direction.

Beaver Valley Enters the World of Art

Louis Hake, Master Car Painter, Pictures the Spirit of Local Industries on the Sides of a Street Car, Which Is Now in Service

EVER quick to seize upon a new idea in public relations work the Beaver Valley Traction Company, New Brighton, Pa., has made a clever tie-in with the industries which form the backbone of Beaver Valley enterprise. Having a car painter who is a master craftsman with the soul of an artist, it was a comparatively easy task to work the plan out.

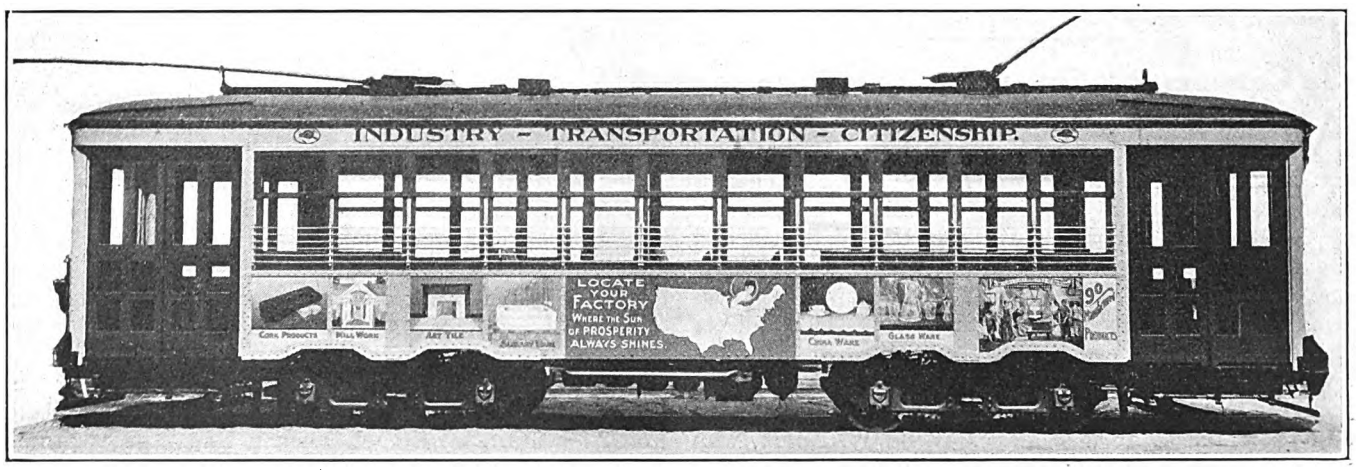
One of the company's double-truck cars was subjected to an intensive process of exterior and interior decoration, the purpose of which was to show the varied



The Invaluable Aid of the Newspapers Was Not Forgotten

nature of the industrial life of the several communities served by the traction company. On each end appears a map of the trolley and bus lines; beside each of these is a pair of eyes within an outline map of the United States. These lend color to the inscription "The Eyes of the Nation Are on the Beaver Valley." And color plays an important part in the *tout ensemble* of the car. Each of the inscriptions on the sides and ends of the traveling good-will builder carries a distinct message regarding some line of industry which provides employment for Beaver Valley citizens. For the most part the actual names of particular companies are not given, as in many cases there are two or more concerns engaged in the line of work depicted.

While other sections of the country might be inclined to dispute some of the claims made for the charms of Beaver Valley, certainly no one within the valley itself may be expected to be other than highly pleased. The slogan in the center of each side of the car provides an appeal to industry in general to locate in Beaver Valley. "Where the Sun of Prosperity Always Shines."



Probably the Masterpiece of the Entire Gallery Was That Appearing at the Extreme Right Picturing the Brawny Steel Handlers at Work

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Other units in the general scheme of design illustrate successfully the products of the steel and iron plants, glassware, chinaware, sanitary ware, art tile, mill work, cork products, bridgework, clay products, drilling machinery, wallpaper, nails and rivets, electric power and transportation and the local newspapers.

A slogan at the top of one side blazons forth the words "Industry, Transportation, Citizenship," the three most important phases of community life in the estimation of the Beaver Valley officials. At the top of the other side appears the phrase, "A County with Ninety Different Products." Naturally it was impossible to feature all of these products at the first showing of the car, so it is planned to withdraw it from service occasionally and replace some of the present designs with new ones.

The car went in service on May 5 and will be operated over the entire system of the company. Thus each of the ten communities served by the trolley lines will be given an opportunity to expand with local pride as the car appears within its environs. And well may Louis Hake, creator of a new school of industrial art, the designer of the first multi-pictured street car, expand also with pride as he listens to the plaudits of the local papers and leading citizens. All of his designs were good, but the gem of the collection was the scene depicting the brawny steel workers following the ancient rites of Vulcan. Across the top in a scroll appeared the words "He Who Toils Here Hath Set His Mark." So accurately had the artist portrayed the scene that the heat could fairly be felt to emanate from the white hot steel in the ladle. To paint life-like human figures in natural colors on the exterior of a street car is no piddling task.

Prior to placing the car in service the railway had placed a series of "Just Smile" cards in the cars, these being varied with more serious messages concerning the service of industry and transportation. Details on these were published in the JOURNAL for April 24.

Nothing has been asked from the local industries in return for the unsolicited boosting which they receive from the use of the cards and the decorated car. Clinton D. Smith, general manager of the company, believes that what redounds to the credit of the valley as a whole will prove of just as great, albeit somewhat more indirect, value to the railway. And he is gaining friends among the local interests which may be inestimably helpful, should the day arrive when the company wishes to enlist the support of its friends and patrons for an increase in fare or a sweeping reorganization of transportation service.

In Commemoration of Easton's Railway

A BEAUTIFUL bronze tablet, 16 in. x 24 in., has been placed on one of the tiers near the south entrance to the Bushkill Bridge, Easton, Pa., commemorating the building by the Lafayette Traction Company of the third electric railway in the United States and the first electric railway in the city of Easton. This line, now a part of the Easton Transit Company's system, ran from Centre Square to College Hill, and its building, which was completed Jan. 14, 1888, was bitterly opposed by residents of North Third Street, who objected to the planting of poles. The marker was paid for and presented by former Mayor David W. Nevin, who was secretary and treasurer of the Lafayette Traction Company.

Subsidized Bus Lines in Houston Serve Recently Established Suburbs

DUE to the ship channel making Houston, Tex., a deep water port, as well as other causes common to the great Southwest development, this city has experienced an unusual expansion. This growth has expressed itself in part by extensive real estate developments from 3 to 5 miles out from the center of the city and remote from any form of transportation except the automobile. Naturally enough the real estate developers have realized the importance of common carrier transportation. The Houston Electric Company, operator of the local transportation system, was naturally unwilling to add unprofitable lines in order to develop new territory.

The compromise made was a contract between the real estate operators and the railway by which the company operates the bus service and the real estate operators agree to pay all costs, including the per car-mile operating charges and a proportion of depreciation, fixed charges, taxes and license fees each month. All revenue is credited, so that in reality the realtors pay only the deficit. The company, however, buys the bus equipment and hence contributes its full part by financing the project.

The contract provides that the Houston Electric Company may take over the operation at any time that it so elects, and agrees to take it over whenever the gross receipts shall show a surplus over all expenses for a period of six months. Any surpluses made during individual months are credited to the realtors subsidizing the project. As there is no state regulation in Texas, permits to operate must be obtained from the city. The company protects itself by getting permits only from year to year, each renewal being based on the mutual desire to continue the contract for another year.

At present there are four of these subsidized lines running from outlying points to the center of the city. One feature of interest is that these lines are operated express from the outlying district to the city center so that a faster service to these communities is being furnished. At the same time there is no conflict with existing car and bus lines that may be paralleled for a distance near the city center. A 10-cent fare is also charged on all such lines with transfer privilege to and from cars. The over-all costs of these express lines are from 26 to 28 cents per bus-mile. Gross business of the lines is gradually increasing and varies between 15 to 18 cents per mile, so that the deficits are not large, because comparatively infrequent service is offered.

All buses operated in this manner are clearly marked so that the patrons know that the line is not necessarily permanent and depends on the subsidy of the development company named in each case. This somewhat temporary feature is recognized and has a certain effect on land purchases. The general belief is that the line will eventually become a paying proposition and become permanent and that the subsidy will last until this point is reached.

The Houston Electric operators are about to start six other bus lines in conjunction with their regular car service. Three of these lines serve new territory and two lines are feeders. Generally on the regular bus lines the fare charged is 7 cents cash and four tokens for 25 cents, except that when a line is operated to give express service the fare that is charged is 10 cents cash.

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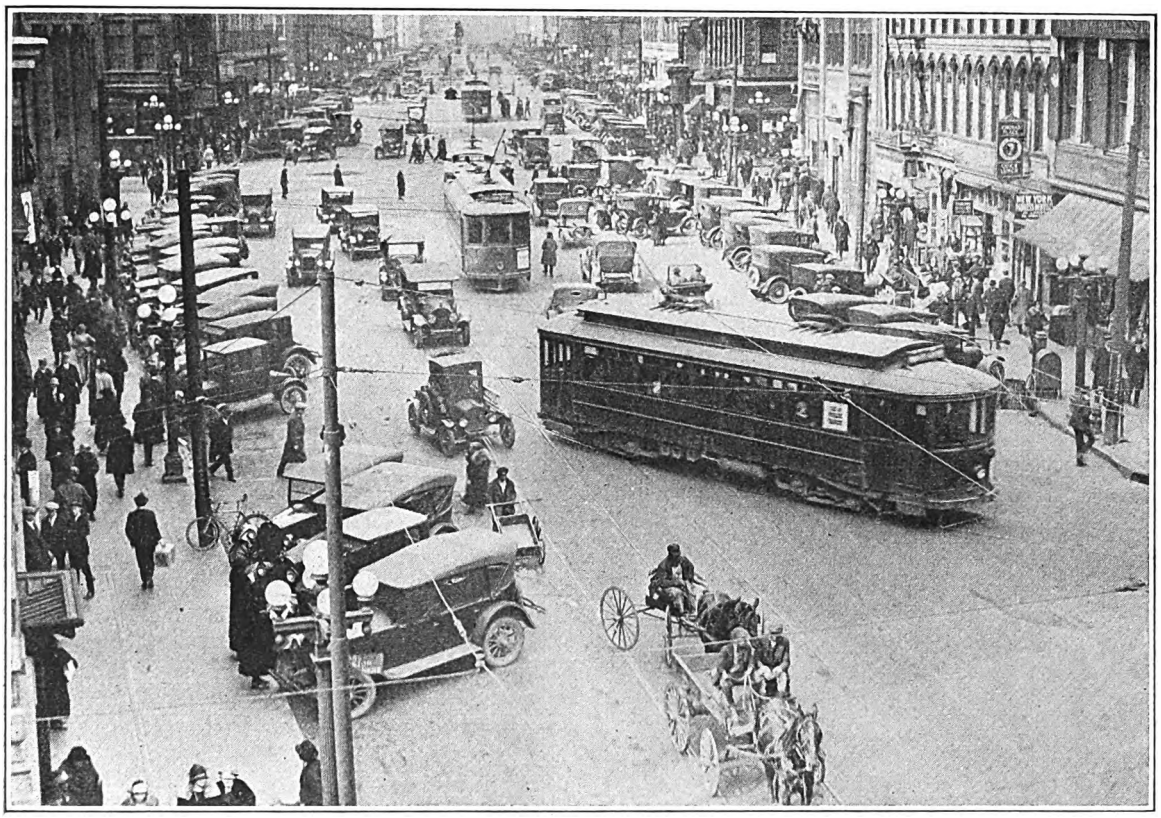

Electric Cars, Automobiles, Teams and Pedestrians Need Every Inch of Room There Is on the Downtown Streets in Atlanta

Maintaining the Morale in Atlanta

Transportation Men Encouraged to Neatness by Free Shoe Shines and Clothes Pressing at Carhouse—Suggestion Box and Full-Length Mirrors in Trainmen's Headquarters—Social Clubs, Safety Work, Credit Union and Other Activities Among the Employees

VERY trim in appearance are the trainmen in Atlanta. A great deal of stress is laid on the need for neatness by the Georgia Railway & Power Company. The men are encouraged to maintain this standard of appearance by being able to have their clothes pressed and their shoes shined free of charge at any carhouse of the company. There is also a full-length mirror in every division headquarters for the use of platform men. Above this mirror are the words: "Look at yourself and see if you properly represent your company." Besides his regulation uniform, every platform man is required to wear a white shirt, white linen collar and a four-in-hand tie while on duty.

Adjoining the mirror in the transportation headquarters is a box in which the trainmen are invited to deposit suggestions for the improvement of the service. Many good ideas are obtained in this way, particularly on the arrangement of schedules. Every suggestion is considered and is answered, usually by the superintendent of the division with which the man is connected.

On the line of route are several boxes in which conductors deposit envelopes containing the transfers collected on each round trip. These envelopes, one of which is illustrated, are collected once an hour by the auditing department. The auditing work is continued all day. The purpose of the plan is to make conductors more careful in the collection of transfers.

To help the men keep their cars on time a blue-printed time-table of his particular run is posted in front of every motorman or one-man car operator. It is held in a frame carried under the hood.

Within the organization there are several social or recreation clubs. One is the Power Club, to which all employees of the company are eligible. This club has the use of some very attractive camping grounds about 60 miles from Atlanta, on which there are 25 or more housekeeping and other cottages. These recreation grounds are used extensively by the men and their families during the summer.

In addition, there is a social club, with women's auxiliary. This club is especially for the transportation men and has its headquarters in transportation headquarters on Piedmont Avenue. Dances are given twice a week, and the clubroom has other means of recreation like pool, basketball, radio and a stage for the presentation of any entertainment during these programs. The dues of this club are $1 initiation and 50 cents a month.

Adjoining the clubrooms in the main transportation building on Piedmont Avenue are the offices of the company doctor and dentist. Medical attention by the doctor is free to any employee and his family, and the dentist's charges are much less than those of an outside dentist.

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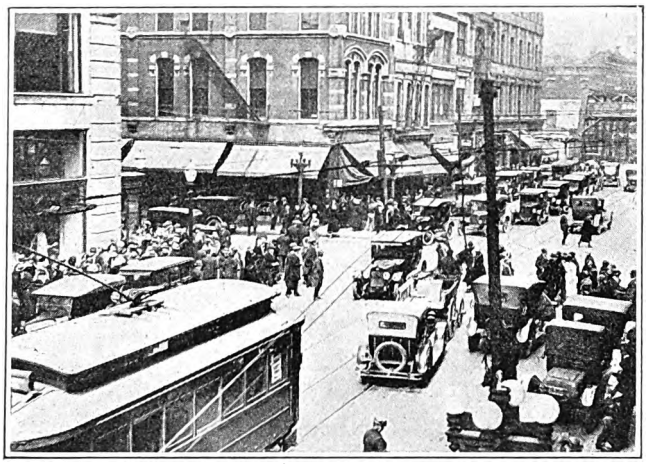
During the past eighteen months the company has devoted a great deal of attention to the reduction of accidents, and in March, 1925, a safety council to represent all departments of the company, light and power, as well as the railway, was appointed. The Safety Council is made up of the department head or other real representative of each department. In addition, each department has at least one safety committee.

In the railway department there is a safety committee for each carhouse, track gang and line gang. The rule of rotation of membership is followed in each committee, each member serving three months, then being replaced by another, so that eventually all will serve. The number of the members in each committee varies according to the size of the gang or division. Most committees have regular meetings. Usually the road gang committee meets on rainy days, the carhouse committees in the evening, and the linemen twice a month on Saturdays.

In addition to the division committees mentioned, there is a large committee known as the first aid committee, whose duty it is to spread information about what to do in case of accidents. Through this committee a class of 27 employees from all departments was formed and received the standard Red Cross first aid instructions, so that all have now first aid committees. These men are now giving instructions to other employees, so that all will have a knowledge of first aid work. All those employees whose duties require them to work near high-voltage apparatus receive special instructions in the prone pressure method of resuscitation.



Traffic at Most Congested Crossings Is Now Controlled by Light Signals

Each department makes a report to the main safety committee each month, showing the number of man-hours of work, the number of man-hours lost for any reason, the number of accidents for the department and the cause of each accident. Every accident is investigated.

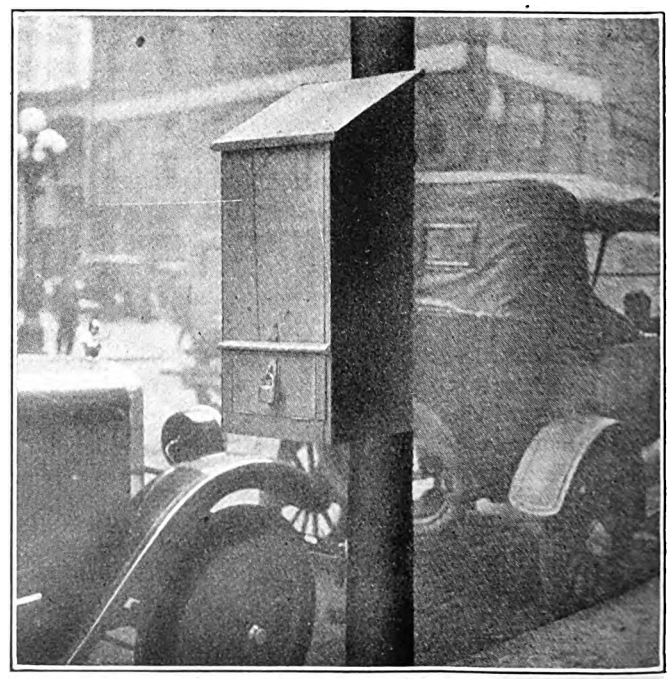
Since this campaign was started the total number of accidents to employees has been reduced 25 per cent. This is considered proof that the campaign is effective.

In the railway department every accident in which an employee is involved is discussed with him, whether he is responsible or not. There is also a talk to all the men on each division each month on the subject of safety. In these talks the accidents reported during the previous month are used as text. The accident records of the railway department show that this plan is effective. Thus all accidents for 1925 show a reduction as compared with the previous year from 6,778 to 5,599, or more than 17 per cent.

Neat Car Stop Sign on Ornamental Lamp Post, Used Generally in Atlanta

CREDIT ORGANIZATION ENCOURAGES THRIFT

The latest addition inaugurated by the company is a credit union based on the Filene system, which has been adopted by a number of steam railroads and other corporations. Other unions along the same lines have been organized at Louisville by the Louisville & Nashville Railroad, at New Orleans by the Illinois Central Railroad, at Council Bluffs by the Union Pacific Railroad, at Boston by the New England Telephone & Telegraph Company, and in Mr. Filene's own store in Boston, where the membership is 1,636. A law author-



Box Near Terminal of Run, in Which Trainmen Deposit Transfer Slips at the End of Each Trip

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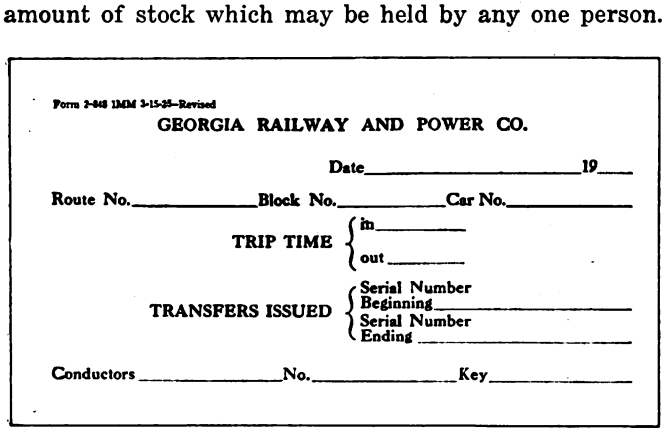
izing the establishment of a credit union of this kind was enacted in Georgia last summer, that state being the twenty-fourth to have such a statute.

Briefly, the credit union is a co-operative savings and loan association, for whose stock any employee may subscribe and thereby become a member and from which any member can borrow limited sums at reasonable rates of interest. It therefore helps to stimulate thrift through a system of savings, solves the short-term credit problem of the employee and educates the members in the management of money. While subscriptions to the stock may be paid in cash, members are encouraged to pay for them by installments, so that if a member wishes to save a dollar a week, for example, he subscribes for four shares and deposits 25 cents a week for each share. The par value of each share is $5 and a limit of $500 has been placed on the amount of stock which may be held by any one person.


Form 2-948 IMM 3-15-25—Revised

GEORGIA RAILWAY AND POWER CO.

Date_____19___

Route No._____Block No._____Car No._____

TRIP TIME { in_____ / out_____

TRANSFERS ISSUED { Serial Number Beginning_____ / Serial Number Ending_____

Conductors_____No._____Key_____

Front of Envelope Used by Conductors and One-Man Car Operators for Depositing Transfers at the End of Each Trip

Members may also make deposits, but the maximum deposit permitted any member is $500.

Loans up to $50 are made to any member whose name is approved by the credit committee. No security is required for loans up to this amount except the borrower's note. Loans for more than that sum must be secured. The interest rate charged is 6 per cent and interest is deducted at the time the loan is made. A maximum of $150 is set for secured loans.

The organization is managed by the employees, but in Atlanta one of the fiduciary officers of the company acts as its treasurer. Officers are chosen from and by the members at elections, in which each member has but a single vote, whatever his shareholdings. Besides the officers and directors the organization has a supervisory committee and a credit committee. The latter body passes on all loans and the supervisory committee serves as a check on officers and directors. The overhead expenses are very low, as no salaries are paid to any one, and the company charges the organization no rent for a room in one of its carhouses used as an office. Hence, the greater part of the interest received on loans can be used as income to pay dividends. It is expected that a dividend rate of 4 per cent can be maintained.

Employees of the company who are not owners of stock are permitted to deposit their savings in the union and receive 4 per cent interest, but they are not eligible for loans. The maximum deposit for any non-member is the same as for a member, namely, $500.

At the time of the organization of the union, early this year, subscriptions for more than 380 shares of stock had been received.

Why Electric Cars Will Remain in Berlin

Transportation Expert Calculates that if Buses Were Substituted for Electric Cars in Local City Service Fares Would Have to Be Doubled

COSTS of handling the surface car traffic in Berlin by buses instead of by electric cars have recently been estimated by Dr. E. Giese, professor of transportation at the Berlin Technical High School. The results appear in the issues for April 30 and May 7 of *Verkehrstechnik*, and Doctor Giese finds that a fare twice that now charged on the surface lines would have to be charged if buses should replace the cars. The street railways in the city are operated by a stock company, but all of its shares are owned by the city, so that the system is essentially a municipal enterprise.

Doctor Giese assumes at the beginning of his study that if the buses were substituted for the surface cars they would have to assume the same street paving charges. The cost of this paving charge to the Berlin tramway system last year was $1,200,000 (5,000,000 marks) as the company was responsible for the paving of a strip 9.3 ft. (2.84 m.) wide for each track and also for the upkeep of all parked reservations through which the lines operate. Other special obligations of the street railway are a traffic tax, which is now 3.85 per cent of gross (1.1 cents per car-mile or 2.9 pf. per car-kilometer) but will be 5.66 per cent of gross (1.6 cents per car-mile or 4.2 pf. per car-kilometer), and also an 8 per cent gross earnings tax paid to the treasury of the city. In contrast to these charges, the vehicle tax on motor buses is only $48 (200 marks) a year, and road maintenance charges are exacted only by some of the communities outside Berlin.

Doctor Giese makes the following comparison of the principal items of expense after omitting gross earning and other taxes which have nothing to do with the economics of the case:

COST OF CONDUCTING TRANSPORTATION

	Cents per Car-Mile*		Pfennigs per Kilometer	
	Car	Bus	Car	Bus
Salaries and wages	6.1	8.1	15.8	21.0
Power or fuel	2.2	5.4	5.8	14.0
Tires (solid)	....	1.9	....	5.0
Maintenance of way	1.3	....	3.3	....
Street upkeep	....	3.1	....	8.0
Maintenance of overhead line	0.2	....	0.5	....
Maintenance of rolling stock	2.0	5.8	5.2	15.0
Depreciation	2.5	4.4	6.6	11.5
Miscellaneous and taxes	2.3	3.8	6.0	10.0
Interest and amortization	3.8	2.1	10.0	5.5
Total cost on vehicle-mile or kilometer basis	20.4	34.6	53.2	90.0
	Cents		Pfennig	
Total cost per mile, or kilometer, per passenger capacity, seated and standing	0.292	0.641	0.76	1.67

*In this table and elsewhere in this article a mark is taken as equivalent to 24 cents and a kilometer as 0.625 mile.

GREATER CAPACITY ACCENTUATES CAR SUPERIORITY

It will be seen that on a vehicle-mile basis the bus costs about 1.75 times as much as the car. On a passenger-capacity mile basis the bus costs 2.2 times as much as the car. This capacity comparison is based on the assumption that the bus operator would use his largest double-deckers. One of these is rated as a 59-passenger bus, made up of 24 seats and room for three standing passengers on the lower deck, room for six standing passengers on the platform and 26 seats on the upper deck. The other bus is like that just mentioned except that it has only 21 seats on the upper

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deck. As the upper deck is not much used in bad weather, Doctor Giese assumes the average capacity of all buses as 54.

On the other hand, the trolley service would be made up of 55 per cent motor car and 45 per cent trail car mileage, each unit having a capacity of 70 passengers, estimated as follows: Twenty-four seats and room for fifteen standing passengers inside the car plus room for fifteen and sixteen standing spaces on the platforms. The personnel requirements would be one man for each 47 car riders (three men for 140 passengers), as compared with one man for each 27 bus riders (two men for 54 passengers).

Buses Would Require Double Fare

In 1925 the average cash fare on the cars was 3.6 cents (15 pf.). From the comparison of costs given in the table it is apparent that the buses would have to charge a fare 2.2 times as much, or 7.92 cents (33 pf.). Even if the buses had a somewhat better load factor their fare could not be less than 7.2 cents (30 pf.).

As a matter of fact, the trolley fare was less than 3.6 cents (15 pf.), due to the sale of reduced-rate monthly cards. This brought the average rate per through ride down to 3.21 cents (13.39 pf.). The rerouting of the Berlin system in accordance with the American transfer plan has produced a transfer ratio of 42 per cent, yielding a rate of only 2.33 cents (9.7 pf.) per trip. The street railways, largely because they include considerable mileage in thinly settled suburbs, averaged only 8.5 passengers per car-mile (5.18 passengers per car-kilometer), whereas the buses, which operate largely on city routes, averaged 8.99 passengers per car-mile (5.62 per car-kilometer).

The fare on cars for an average ride of 2.94 miles (4.7 km.) was 3.21 cents (13.39 pf.), or 1.09 cents per mile (2.85 pf. per kilometer). The fare on the buses for an average ride of 2.2 miles (3.5 km.) was 4.1 cents (17.2 pf.), or 1.86 cents per mile (4.9 pf. per kilometer), or 72 per cent more than the fare on cars.*

On the basis of 800,000,000 passengers a year and an average ride of 2.94 miles (4.7 km.) per passenger, the street railways run 2,352,000,000 passenger-miles (3,760,000,000 passenger-kilometers). If this figure is multiplied by the present actual difference in fare (4.9 minus 2.85), the public of Berlin would have to pay 77,000,000 marks (or $18,480,000) a year more for surface transport if street railways were abolished. This estimate is on the assumption that a blanketing bus system would charge only 72 per cent more, but in reality the taking on of thin routes, street railway style taxes, etc., would call for a 100 per cent rise in fare.

The net result would be that buses would charge 214,000,000 marks ($51,360,000) a year instead of 107,000,000 marks ($25,680,000).

The Berlin public, says Doctor Giese, cannot afford any 107,000,000 mark luxuries. It is proving hard enough to raise only 10,000,000 marks for the breakthrough of dead-end streets in congested districts.

In further explanation of the figures in the table, Doctor Giese says that the power item for the trolley is figured at 2.15 cents (8.98 pf.) per kilowatt-hour, which is only a little more than 5 per cent above the pre-war rate. Superpower developments are likely to make for lower rather than higher power costs in the future. On the other hand, automotive fuel (gasoline and benzol) now costs 40 pf. per kilogram, as against pre-war costs of 22 to 28 pf., and it is of poorer quality. The tremendous expansion of the automotive field does not tend toward lower fuel prices.

One reason for the higher power costs of a trackless vehicle lies in the higher tractive resistance. This resistance is only 24 to 30 lb. per ton (12 to 15 kg. per metric ton) for motor cars and 10 lb. per ton (5 kg. per metric ton) for trailers, while buses on asphalt have a resistance of 40 lb. and on rougher paving of up to 70 lb. per ton (20 kg. to 35 kg. per metric ton).

There is a possibility that taxes might be lowered once the government has rebuilt the highways to meet the heavier traffic, but this lies in the future.

Tire cost is based on the use of solid tires, but pneumatics would cost four times the figure given. This increase is 1½ times the entire interest and amortization charge of the street railways. A possible later reduction in the cost of giant pneumatics is only a guess.

A comparison of the cost of new equipment shows that a motor car of 70 passengers capacity costs $8,400 (35,000 marks) and a trailer of like capacity $4,800 (20,000 marks). On the basis of the present proportion of motor cars and trailers in Berlin the average replacement cost per car for the present 3,153 cars in Berlin may be taken as $6,648 (27,700 marks) each, or $94.80 (395 marks) per passenger served.

A 54-passenger capacity bus would cost $7,200 (30,000 marks) or $133.44 (556 marks) per passenger—40 per cent more per passenger than the car. To do the same job as the cars 4,000 double-deck motor buses would be needed.

The present interest and amortization charge is on an investment of approximately $60,000,000 (250,000,000 marks), of which 80 per cent represents the principal property taken over, viz., the Grosse Berliner Strassenbahn. Interest and amortization are covered by a charge of 6 per cent. New capital for motor buses could not be obtained at this favorable rate.

Increasing Importance of Street Railway

Finally, Doctor Giese shows that the street railways have more than recovered their pre-war importance in the Berlin transport scheme. In 1913 street railways carried 50.5 per cent of all traffic. In the unsettled rerouting year 1924 the average was only 39 per cent, but 46.3 per cent was attained in December, 1924. In January, 1926, the ratio was 53 per cent.†

No responsible authorities, concludes the author, could put forward any such proposal as the replacement of the Berlin street railway system. Because of the higher cost of bus operation its field appears to be:

1. Operation in streets where track is not feasible or permitted.
2. To supply additional service where streets are wide enough.
3. For feeders and cross-country runs.
4. For non-stop special fare service and for night operation at owl fares.

If economic reasons alone were to govern, there would be no further development of motor bus routes in Berlin. However, there is a place for them in a co-ordinated system which would charge correct rates and make each type of transport carry its fair share. In the opinion of the author, such co-ordination should be under municipal control.

*City bus fares are on the basis of 15 pf. for the first zone, 20 pf. for two zones and 25 pf. for three zones. The zones average 2.2 miles (3.5 km.) each.

†In March, 1926, the street railway percentage was 56. In the meantime, the bus percentage had grown from 6.2 per cent in January to 7.5 per cent in March.—EDITOR.

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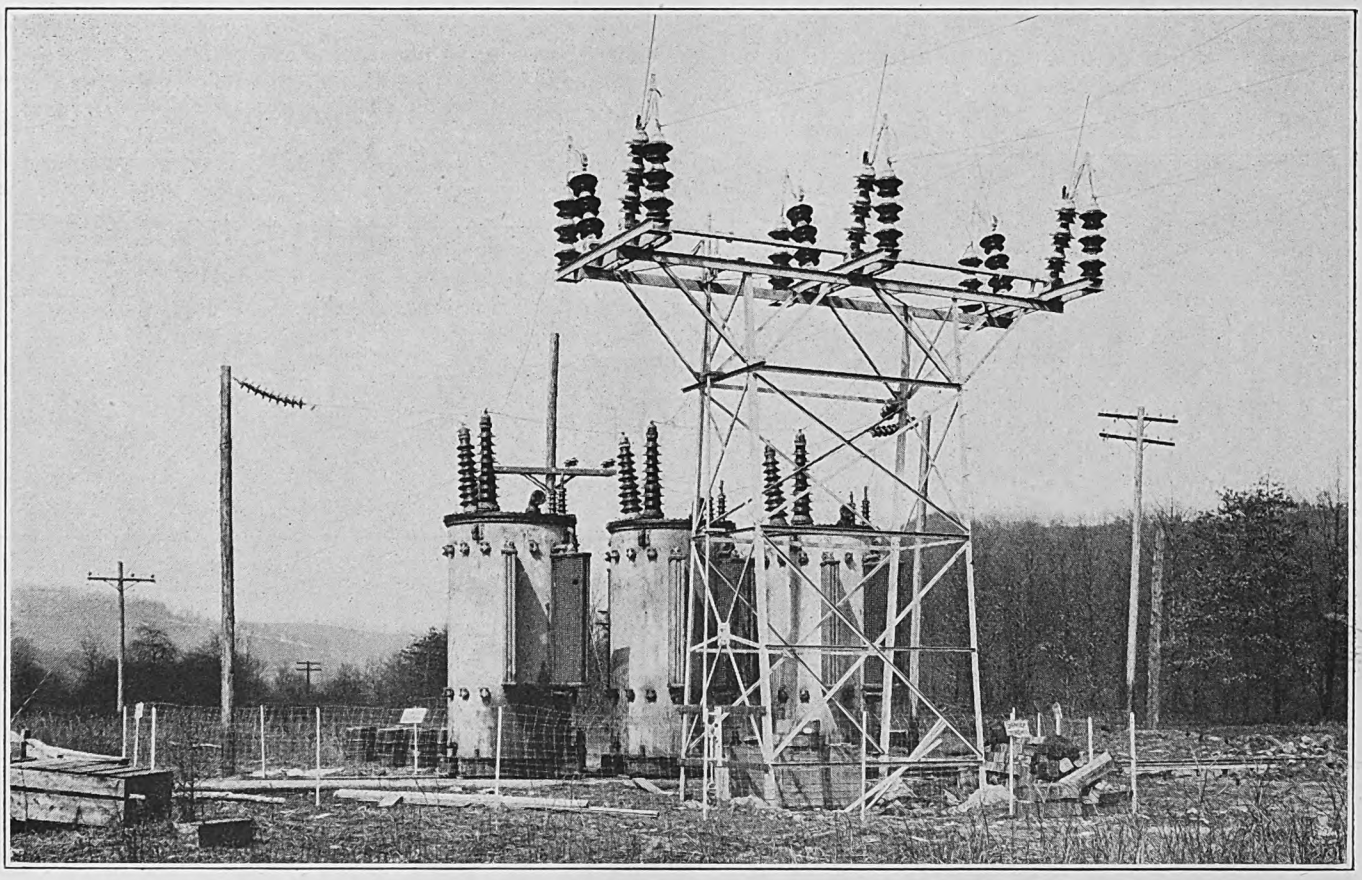
Transportation Service Continued During Flood

Citizens of Oil City, Pa., Carried by Company's Buses and Emergency Equipment During the Recent Devastating Ice Jam on the Allegheny—Trolley Service Quickly Restored



Temporary Set-up of Transformer Equipment Made at Petroleum Center to Serve the Floodstricken Area About Oil City

PICTURE an emergency substation constructed in perilous fashion on the top of a coal pile. Grinding, smashing blocks of ice were rising slowly but inevitably in the river alongside a power plant normally furnishing energy for three busy industrial centers. Its equipment was submerged and out of commission after a gallant but futile fight to withstand the icy invader; streets and basements were under water throughout the business districts and the grim prospect of still further rises of the ice-choked river before the frozen barrier would be swept away by sheer pressure of the water behind it. That, in brief, was Oil City, Pa., during the course of the devastating flood which visited the Allegheny River in February and March. Now the flood is history; but its consequences, as is the case with all cataclysms, are destined to make themselves felt for some time.

Even today transformers and various other equipment may be seen standing about in varying stages of disarray within the plant of the Citizens' Traction Company and the Citizens' Light & Power Company, while heating coils of many breeds are placed on, under and around them. The process of drying out is a slow one and the end is not yet. Scarcely a day passes in which a generator or motor failure does not occur, due to the ruinous soaking which practically all the company's equipment experienced. V. A. Redfield, vice-president and general manager of the two companies, believes that these unfortunate failures, which are a direct result of this devastating flood, will continue for at least a year.

While nature was on the rampage, transportation facilities were naturally much crippled. Were it not that the same conditions which forced the discontinuance of trolley service caused also a marked temporary cessation of industrial activity throughout the stricken area, thus removing the usual peak-load conditions on the transportation facilities, the Citizens' Traction Company would have been forced to acknowledge defeat. Actually, the bus equipment possessed by the company was able to cope quite successfully with the situation during the period from March 22 to March 29, when the trolleys were out of commission. Every available bus was placed in service and kept there, by dint of

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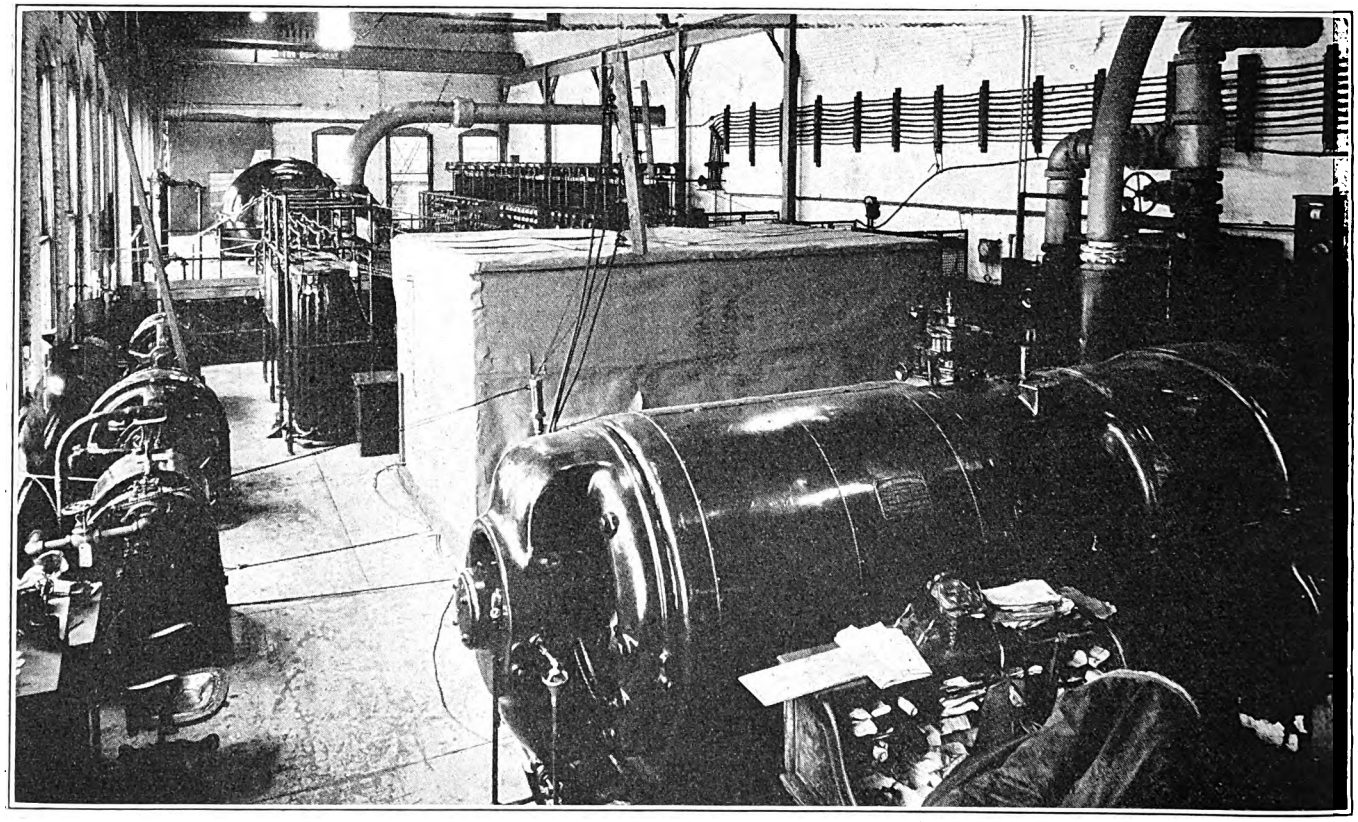
24-hour-per-day labor on the part of the mechanical department of the transportation company.

The story of the fight to prevent a total paralysis of power and transportation service to the cities served by the Citizens' company, of the herculean efforts of employees of the company and of hosts of volunteers to save the high-tension power lines from destruction, of the growing fear that the plans to break the ice jam would go for naught and that the gorge would only be freed as the force of the vast body of water, rising several additional feet, finally broke out the ice barrier, perhaps taking large portions of the cities of Oil City and Franklin along with it—all of this is an epic to be written in words of fire. But to attempt to chronicle it here is out of the question. Let the fact of accomplishment stand for the telling!

power, light and electric transportation in the event that the Oil City power house should be inundated. However, the unprecedented rise in the Allegheny nearly set these carefully laid plans at naught by flooding the switches and the transformers located in the yard adjacent to the power house. Hence, it was necessary to move this essential equipment to the highest point on the coal pile of the plant. Picture the workmen laboring mightily over the rising waters on the uncertain footing provided by this coal pile, with swirling torrents, laden with gnashing ice blocks at their feet and the deadly high-tension wires a few feet overhead, the general effect being enhanced by a liberal contribution from above by J. Pluvius!

Transportation facilities in the flood-visited area are now practically back to normal, and the power equip-



A Scene in the Oil City Power Plant Showing the Method Employed to Dry Out Part of the Rotary Equipment

The first high water in the Allegheny occurred on Feb. 21, and at that time it was made evident that emergency steps would doubtless be required to combat the encroaching flood waters. Accordingly, the Citizens' company made arrangements with the Penn Public Service Company to interconnect systems and thus supply the Oil City district from the latter's Piney Dam hydro-electric plant. To do this it was necessary to build 3½ miles of 25,000-volt line and secure three transformers to step down the voltage from the Penn company's 110,000-volt system to the Citizens' Light & Power Company's 25,000-volt line. The three transformers were borrowed from the West Penn Power Company at Kittanning and given a temporary set-up adjacent to the Pennsylvania Railroad right-of-way and the Penn Public Service Company's high-tension lines at Petroleum Center. To plan and carry out this project was no small undertaking, but it was carried through successfully, so that by March 12 the people of Oil City, Franklin and Titusville were assured of

ment is being brought to that stage as rapidly as is possible. It is estimated that the direct consequences of the flood will cost the Citizens' companies approximately $40,000 or $50,000, exclusive of losses of revenue during the period of the flood. The loss of the Big Rock bridge will necessitate the abandonment of 11 miles of track which formed the connecting link between Ausley and Franklin. This line may be permanently served hereafter with bus equipment. Abandonment proceedings are now before the Public Service Commission of the commonwealth of Pennsylvania.

Electric power and trolley service was not disturbed in Franklin, due to the emergency arrangements made by the company. Power service in Oil City was out only eighteen hours, a rotary converter being installed in the city on March 28 and service being resumed on March 29. After that date the attention of the company was chiefly taken up with ascertaining the extent of the damage and overhauling equipment for normal service once more.

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Police Officers Can Do Much to Improve Transportation

Control of Traffic Should Be on the Basis of Service to the People and in Proportion to the Number Served and Not to Help the Company as Such

BY STANLEY GOOD

Traffic Captain, Police Department, El Paso, Tex.

EDITOR'S NOTE—Stanley Good was the principal speaker at the session of the recent Galveston convention of the Southwestern Public Utilities Association, devoted to traffic. As reported in the April 17 issue of the ELECTRIC RAILWAY JOURNAL, this meeting was one of the first of its kind given over to the discussion of traffic by the police officers of cities. Mr. Good expressed so many sound principles that he was asked to write the present article on this general subject. The broadminded views expressed show the author's intelligent appreciation not only of traffic regulation but of public service *per se*.

PERSONALITY in public service is of outstanding importance and today is being recognized as a greater factor in securing increased business and more satisfied customers than any other form of advertising. In addition to being the most effective, this is also by far the most economical form of publicity.

Officials of all public service companies are giving much serious thought to the training of employees in the art of salesmanship, realizing that in the personality of their employees lies the secret of effecting more sales and creating greater customer satisfaction. Even an imperfection in service is apt to be overlooked where the employee is courteous and solicitous and succeeds in selling himself to the public.

Now the policeman is just as much a public servant as the street railway operator. The public pays for the services of both. If the street railway operator, through his personality, is able to make friends of the public, he gets their support, resulting in increased efficiency and better service. The policeman can do the same thing to an even greater extent. In the case of the police officer, he is able to overcome the feeling of antipathy that the public has borne toward him which it has never felt toward the street car operator.

The purpose of all public utility companies is to render a needed public service at nominal cost. Since, after all, only a small proportion of our population can afford the luxury of individual transportation, a vast majority must depend upon a public service which is able to transport them cheaply and in a mass during rush hours or unusual periods.

The duty of the policeman in charge of the streets is to superintend all traffic and co-ordinate its movements. Being a public servant, he is employed by all of the people, not just a small portion of them. His services must not be to a select few only but to the masses.

It would not be consistent with justice to permit a pedestrian, or an automobile occupied by only one or two passengers, to monopolize that portion of the street allotted to the street car to such an extent that the 40 or 50 passengers in the street car might arrive late at their destination. The rights of the public carrier, as such, does not enter into consideration. It is solely a question of the rights of those being transported, who represent the majority. They have paid for a service which the operator does his best to give and it is the duty of the policeman to see that they get it. If the traffic officer has been properly trained and capitalizes his personality this should be possible without the necessity for antagonizing any one. If a policeman lacks personality, change policemen.

Men of intelligence, fairness, tact and courtesy in dealing with the public are as necessary at busy street intersections as on the platforms of the street cars. Street car operators have demonstrated to their own satisfaction that a car may be crammed with passengers, but by using politeness, no one complains. By using the same tactics a policeman can unravel any traffic jam. In an emergency, a hard-boiled traffic cop is as useless as a careless street car operator. Neither of them is efficient, nor can they get the necessary co-operation of the public.

Any city where results in handling the traffic problem are measured by the number of arrests made for violations of the law has little efficiency. The most successful police officers are those who recognize that their chief mission is to preserve the peace rather than to prosecute its violations.

In El Paso, Tex., the policemen are taught that it is their duty to prevent violations of the law in a way that will meet with the satisfaction of all concerned. These policemen remain in the open in conspicuous uniforms and make it a point to get acquainted with the people living on their beats, calling them by name whenever they meet. The policemen vie with one another in their efforts to make friends, and when it becomes necessary to make an arrest, they refuse to argue with the person arrested and never assume the right to reprimand a citizen, since that is the power of a judge alone. Needless to say, the policemen in that city are popular, and crime and accidents are steadily decreasing, which goes to prove that personality in police work is no longer merely an untried theory.

Milwaukee Cars Carry Heaviest Traffic

RECENT checks of traffic on Grand Avenue, Milwaukee's busiest street, by the transportation department of the Milwaukee Electric Railway & Light Company, show that while eighteen automobiles passed given spots for every one street car, the street cars carried four times as many persons and occupied only one-third as much street space.

Street cars on the average carried 42 passengers per car between the hours of 6 a.m. and 6 p.m., buses carried 10.4 and private automobiles 1.34.

The study shows that the street car passenger occupied only 9.5 sq.ft. of street space, the bus rider 17.3 sq.ft. and the private auto rider 45.7 sq.ft.

Parked vehicles, between the hours of 6 a.m. and midnight, occupied 38 per cent of the street space between the Northwestern depot and Eighth Street; moving autos and trucks, 44 per cent; street cars and buses, 18 per cent.

7.9 per Cent Were Walkers

IN THE article "Better Car Routing and Traffic Control Proposed for Baltimore" in the May 22 issue of ELECTRIC RAILWAY JOURNAL, the figure is given in the table at the bottom of page 888 that 79.9 per cent of the persons working in the central business districts were walkers. This figure should have been 7.9 per cent instead.

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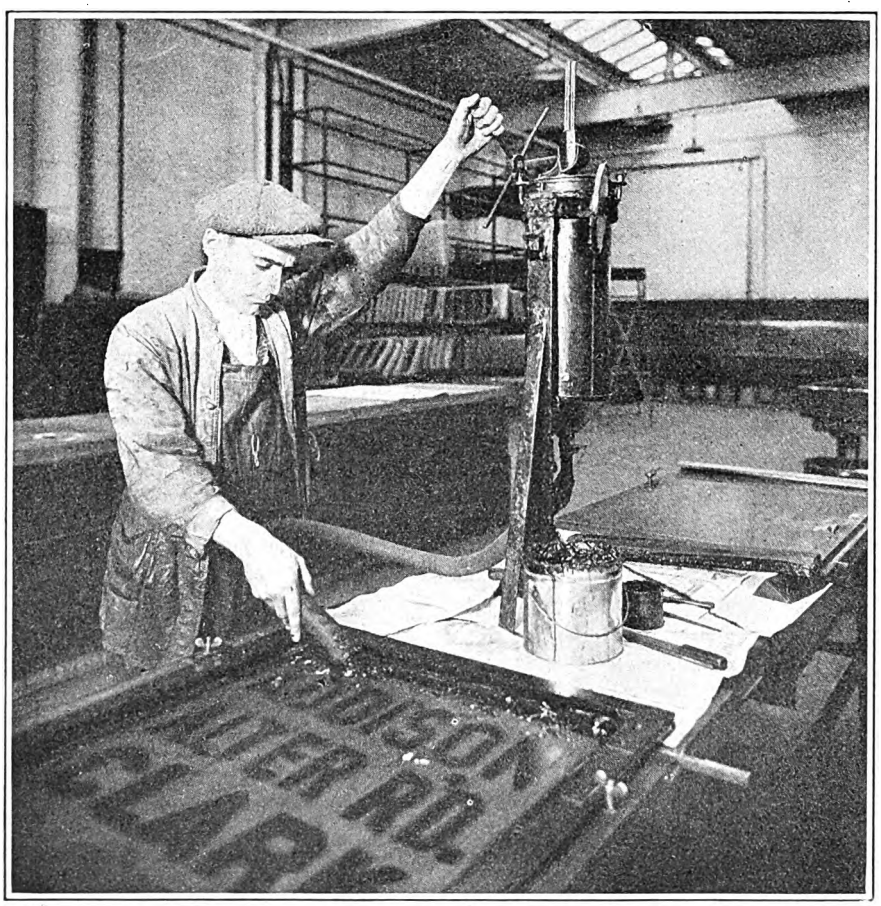
Maintenance Notes

Press Can Supplies Thick Paint

THE silk-screen process for sign painting as used by the Department of Street Railways, Detroit, Mich., was described in issues of the ELECTRIC RAILWAY JOURNAL for Feb. 14, 1925, page 261, and March 13, 1926. A press can, which is used to supply the thick paint to the screen as required and which adds materially to the efficiency of the process, is illustrated herewith. The thick paint as needed for the sign is supplied from a can of 8-in. diameter and 18 in. high, which is mounted above the center of the bench used for the sign-painting process. This can is placed on a support made of steel bars. It is provided with a plunger and operating mechanism at the top. The plunger inside the can is made to move up or down by means of a rack and pinion attachment, the plunger itself being directly connected to the rack. The pinion is mounted on a short cross-shaft, the end of which is provided with a four-spoked wheel. The operator can thus move the plunger up or down by turning the spoked wheel by hand.

The bottom of the can is conical and a ½-in. pipe attachment is provided. Over this a 1-in. hose serves as the flexible connection for delivering the paint to the screen. The illustration shows the operator in the act of placing some of the thick paint at the top of the screen for squeegeeing it onto the sign. By turning the hand screw the paint is forced out of the end of the hose and can then be spread over the surface as may be desired.



Thick Paint for the Silk-Screen Process Is Supplied to the Screen by a Press Can and Flexible Hose Attachment in the Department of Street Railways, Detroit, Mich.

Gas Furnaces for Soft Metal Melting

GAS-FIRED soft metal melting furnaces in which the temperature of the pots is automatically maintained at all times are part of the equipment of the Atlanta shops of the Georgia Railway & Power Company. These furnaces are designed to melt lead, tin, zinc, babbitt and other metals of about the same melting point. The burners are arranged to heat the pot and its contents up to a temperature of 1,200 deg. F., and higher, if desired, and the design and construction are such as to permit of quick heating which assures maximum production.

In the shops are three furnaces, two of 600 lb. capacity each, to melt babbitt, and the third of 175 lb. for solder. The outer shell of each of the babbitt furnaces is of heavy sheet steel, held in place by the top and bottom castings, which are connected by long, heavy bolts. The refractories used are of special forms, of selected grade backed up by proper insulation, while the pots are of cast iron.

These furnaces were designed and manufactured by the Surface Combustion Company of New York and are fired with gas, using burners which are so applied as to discharge tangentially into the combustion chamber. The hot gases pass around the entire surface of the furnace with a swirling, circular motion so that all parts of the pots are evenly heated. The vent is located close to the top of the casing, forcing the burned gases up around the pot, thus utilizing their heat to the fullest degree. The drain hole, also used for lighting, is conveniently located to permit the easy and safe flow of the contents in case of the breakage of the pot. Soft metals demand quick but even heats. Operators get to know the exact amount of heat required for certain metals and with this furnace this degree of heat can be obtained day after day simply by setting the rate of combustion on the gage. Furthermore, this temperature is automatically main-

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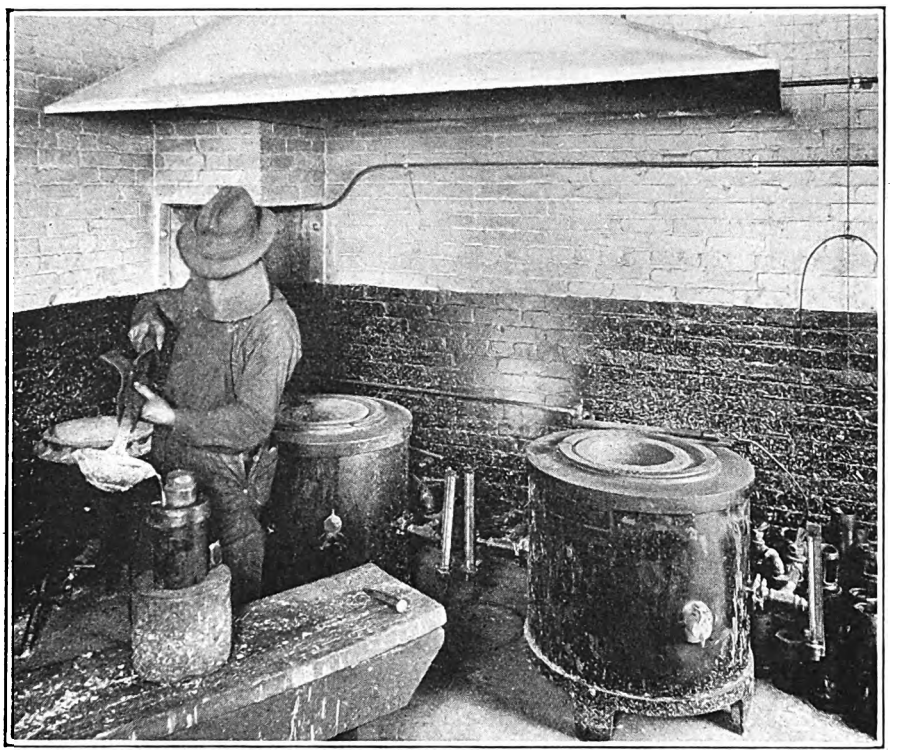


Thermostatic Control Provides Even Heating Temperatures for Atlanta Company's Gas Furnaces

tained and recorded regardless of the operation of dipping out hot metal and throwing in cold, by a recording and regulating thermostat manufactured by the Brown Instrument Company.

The smaller size solder-melting furnace has a cast-iron body closely conforming in shape to the cast-iron pot, which assures a rapid transfer of heat through the pots. The bottom outlet valves of the improved type make it easy to cast molds. A bottom drain valve is opened by a wheel or lever and the metal drains from it into the mold.

The method of firing utilizes city gas, and was develpoed by the Surface Combustion Company. Combustion is maintained in a back pressure atmosphere so as to exclude all secondary air, and the flames are directed upon a refractory bed so as to develop the maximum possible amount of radiant heat. The flues are restricted and arranged so as to distribute the hot gases uniformly and to release them at the lowest possible temperature. The prevention of cold air leakage into the combustion chamber is a desirable feature because it prevents oxidizing effects; also by its cooling action the cold air would lower the furnace efficiency.

The installations are so designed that the furnace atmosphere can be varied at will, either by changing the gas orifice sizes in the inspirators in the high-pressure gas system, or by changing the insert in inspirators in the low-pressure air-gas system. This is an advantage because in certain classes of manufacture, such as vitreous enamel baking, an oxidizing atmosphere must be maintained in the furnace to insure against the reduction of the metallic oxide bases in the enamel. In certain other uses, such as metal treating, an oxidizing atmosphere would be injurious to the metal, causing it to oxidize with the formation of scale. To minimize this production of oxide or scale, a reducing furnace atmosphere is maintained.

The burners are made or molded of alundum or fire clay material to form burner tunnels, which are inclined in such a way as to direct the flames in the most effective manner upon the highly refractory carborundum-faced bed.

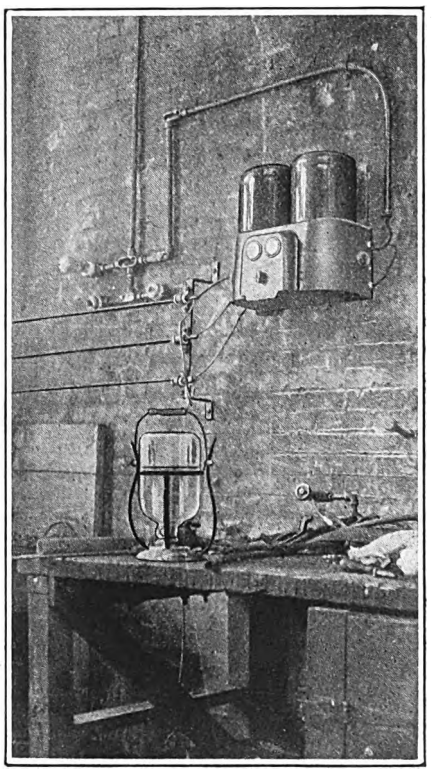
In the high-pressure gas system small compressors are utilized to boost the city gas from line pressure to about 10 lb. per square inch before it enters the patented mixing tubes. These venturi mixers maintain fixed air-gas ratios over a wide range of consumptions, irrespective of the quantity of gas used.

Temperatures are controlled by the regulation of needle gas valves, which govern the gas flow. By raising or lowering the pressure indicated on small pressure gages before each inspirator, the amount of gas supplied is increased or decreased, thereby raising or lowering the temperature. That is, the pressure is an indication of the quantity of gas being consumed. These gages have a range of 0 to 15 lb. per square inch.

In the low-pressure air-gas system the air instead of the gas is controlled by needle valves. In this system pressure or turbo blowers are utilized to supply air to the inspirators at pressures varying from 1 to 2 lb. per square inch. A diaphragm gas-pressure regulator reduces the gas pressure to atmospheric before it enters the inspirator, where it is proportioned with air in the correct amount for complete combustion. Otherwise these two systems are identical as far as method of firing is concerned.

Battery Charger Used for Economy

SO THAT the inconvenience and expense of sending storage batteries to an outside firm for charging might be eliminated the Beaver Valley Motor Coach Company, a subsidiary of the Beaver Valley Traction Company, New Brighton, Pa., has just installed a battery charger. It is of the 115-volt, 60-cycle, alternating-current type and is capable of charging ten



Wall Location of Battery Charger Economizes Shop Space

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batteries simultaneously at the maximum charging rate of 10 amp., or twenty batteries simultaneously where the 6-amp. rate is used.

Batteries are first charged at the maximum rate for several hours and are then reduced to a 6-amp. charge, the entire process requiring from ten to twelve hours. It is estimated that the charger will save its own cost in less than a year, entirely aside from the greater convenience of charging batteries right in the company's garage. A Westinghouse Rectigon charger is used.

Each Shop of the Grand Rapids Railway Has Its Own Individual Waste Cans

Waste Cans Insure Uniform Saturation

GALVANIZED sheet-steel, journal packing waste cans, 22 in. in diameter by 30 in. high, are supplied to each of the maintenance shops of the Grand Rapids Railway, Grand Rapids, Mich. All waste is saturated at the principal repair shop of the company and is delivered by shop trucks in these cans to the particular shops where the packing is to be done. This insures uniform saturation of the waste, since it is all done by one man. The cans are provided with covers which fit tightly and thus prevent dust and dirt from entering the waste after it is saturated.

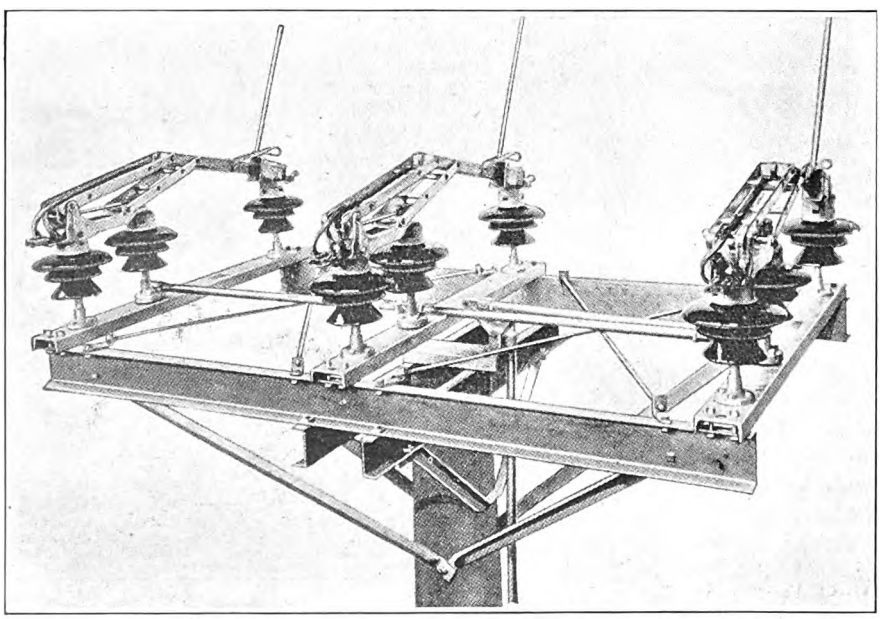
New Equipment Available

Pantograph Air-Break Switch

QUICK, positive and powerful movement of the switch blade is provided in a new pantograph air-break switch being marketed by Schweitzer & Conrad, Inc., Chicago, Ill. The straight-line action of the pantograph permits the blade to enter a fully-housed and protected contact clip. As the blade withdraws from the clip it rises into the arcing position. This, with the fixed horn, forms a pair of arcing horns on which the arc rises and breaks. The contact end of the blade is effectively protected from burning by the arcing fingers which it carries.

Current is carried by flat, flexible copper braids fastened securely to the switch blade and to the hinged terminal of the switch. The pantograph motion links are thus not required to carry current. Motion is communicated to the pantograph by a crank on top of the middle insulator which rotates through an angle of 90 deg. A feature of the design is that this crank passes dead center in closing the switch, thus locking each phase in the closed position independently of the operating handle or connecting rods between phases. Each phase is adjusted independently. The operating handle moves through a vertical arc of 180 deg. and communicates a reciprocating motion to the vertical operating rod.

Particular attention has been devoted to the contact clips. Independent floating contact fingers are pressed against the flat copper switch blade by phosphor-bronze leaf springs. The clip is thus perfectly self-aligning. Very liberal contact area is provided. A full housing open only at one end protects the clip from the weather. Provision is made for drainage of any water which may work into the housing. All bearings are brass or bronze on one side. Grease cups are provided at important points. In the larger switches, ball bearings are used at top and bottom of the rotating insulator.



Pantograph Switch on Single Wood Pole Galvanized Steel Mountings

Back Gearing for Shop Motors

A BACK-GEARED attachment designed to operate under the most unfavorable conditions is announced by the General Electric Company, Schenectady, N. Y., for use with its "500 series" induction motors. This attachment is of unusually strong construction and is easily installed and adjusted.

The base, to which the motor and back shaft pedestals are bolted and doweled, is a single large casting. A special unit-type pedestal is used, one casting forming the housings for the large back shaft bearings. Thus maximum rigidity and permanent correct alignment of shafts and meshing of gear and pinion are assured. The back shaft is provided with shoulders to limit end play and is made of special steel. It is supported by two extra large, double-seated, split bearings in dustproof housings, holding oil sufficient for a number of months operation.

A split gear case, fabricated from steel plates, protects the gear and pinion from dust and retains the grease or oil in which the gear runs. Two standard gear ratios are available. Steel or fabroil pinions with cast-iron gears may be used.

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Association News & Discussions

Operating Problems Hold Attention at Canadian Convention

Bus Operation, Budgetary Control and Maintenance Practice Are Principal Topics at Quebec Meeting—Attractive Exhibits Are Shown

BEAUTIFUL Quebec gave a cold reception to 275 members and guests at the 22d annual convention of the Canadian Electric Railway Association, held there June 2-4. The low temperature, however, merely served to increase the attendance and the enthusiasm manifested at the meetings.

The theme of the convention was given in the annual address of the president, W. S. Hart, treasurer Shawinigan Water & Power Company and Quebec Light, Heat & Power Company, Ltd. He emphasized the point that operators must improve their service with cars and must realize the value of the bus. Better publicity is needed. In this, he said, there always is room for improvement.

Following the presentation of reports of the treasurer and the secretary, committee reports were reviewed. That on accident prevention was read in brief by Chairman W. R. Robertson, general superintendent Hydro-Electric Railways, Toronto. Of all electric railway accidents in Canada, 65 per cent are collisions with automobiles, the largest portion of which are caused by autos turning out from the curb. Investigation shows that the one-man car is not a source of accidents. So far no case of accident on the Hydro-Electric Railways has been caused by the treadle door.

In the report of the motor bus and truck committee, read by Chairman F. D. Burpee, vice-president and manager Ottawa Electric Railway, results of a questionnaire were analyzed. Out of 25 member companies, 23 believe in having bus transportation furnished by the electric railways. In the opinion of the committee the best method which the railway members can adopt to eliminate motor bus competition is to go into the bus business themselves. This procedure may open up new and profitable channels of business.

In the discussion which followed, Gordon Lee, American Car & Foundry Motors Company, urged that officials of the various properties refrain from incorporating original ideas into the design.

G. H. Scragg, International Motor Company, said that some of the laws that have been passed in the United States are such that buses cannot run in adjacent states. Most of the restrictions are on bodies, so that the customer gets lower value in bodies than in chassis.

L. Tait, manager London Street Railway, London, Ont., outlined some of the methods of bus competition practiced in his city. One line started by the railway itself parallels a car route. It has built up a new business without hurting the car line.

Bus Operation Considered

The principal paper presented at the second day's session was that on bus operation, by D. J. Locke, staff engineer Public Service Railway, Newark, N. J., on "The Motor Bus in Urban Transportation." Mr. Locke's paper is abstracted elsewhere in this issue. A lively discussion followed, and Mr. Locke answered many questions regarding the practices of his company. C. M. Shaw, Montreal, felt that by adding bus service it would be possible to make more money on the investment and give the public more service.

A. T. Spencer, Toronto, stated that in Toronto a differentiation is made between motor buses and coaches. The bus is used as an adjunct to the street railway, while the coach is used independently for sightseeing, chartered service and at present on one regular route.

Mr. Locke outlined the history of bus operation in New Jersey. By 1923 the railway was so seriously affected by bus competition that it had to get control of the buses or abandon its rail operations. It was decided to get the buses. The company believes that the duplicate service which now exists in many sections is wasteful and that much better service will be given when co-ordination of the two vehicles is completed. He pointed out that at present the company is largely rendering a mass transportation service with its buses, a large part of which is uneconomic because it offers duplicate service.

Major Burpee pointed out that in Ontario one-man permits are allowed. An operator of a single bus can frequently make a profit for himself. The company may have to take a loss to operate the one vehicle, although the operation of the single bus in competition may mean an equal loss. Mr. Locke stated that most of the buses bought out by the Public Service Railway were operated by individuals. Whether or not a particular bus should be purchased is a local and individual problem involving many factors.

D. E. Blair, Montreal, agreed with Mr. Locke that the advantages of the combined rail and bus organization are that it saves duplication in supervision and maintenance. Replying to his question, Mr. Locke said that the geography of a system enters largely into the problem of housing and maintenance of buses. It has not been found desirable to group buses in numbers of more than 100 to 125 at any one point. On the Public Service system the units average less than this, in the smaller centers being not more than 20 or 30 buses. The availability of railway owned property is an element in this, and another is the dead mileage. In general a company must plan for expansion of its bus business. Another factor is the availability of the existing railway organization and its facilities. In most places on the Public Service system it has been unnecessary to set up a new operating organization.

The Irvington shops are used both for rehabilitating purchased buses and for regular operating overhaul. Mr. Locke believes that eventually many of the repairs will be made in the garages with overhauled units and the overhaul shop will be reserved for complete overhauling of large units of the equipment and for new construction. Body work can be handled to advantage by the railway organization on account of the similarity of the operations, while engine and chassis repairs may better be handled separately.

A. H. Foster, Brantford, is of the opinion that buses are here to stay. The railways are going to their use rather unwillingly, partly since they lack data on operating costs and fares that should be charged. He questions whether the rates charged in many cases will be found adequate.

Replying to a question by Mr. Shaw, Mr. Locke said that members of the Public Service street car and bus operating organizations are largely interchangeable. The operators of trolleys and buses are in one organization with one seniority list. On the semi-annual pick an operator may elect to change from trolley to bus or vice versa. Certain parts of the training are common, but special training is given for the two kinds of work. Road supervisors are the same to a certain extent, but some of these men are separate. The carhouse men are largely the same. Above these ranks the duties are mainly handled in common. The chassis maintenance is, however, separate.

The life of the earlier types of buses with truck chassis is comparatively short, being about four or five years. It is hoped that the gas-electrics will last at least ten years. The company is setting up 3 cents per mile for depreciation for a fleet of more than 800 buses of many types.

E. J. Murphy, statistician American Electric Railway Association, referred briefly to the work of that organization, particularly with regard to motor

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buses. He pointed out that the Accountants' Association has drafted a uniform system of bus accounting.

BUDGETARY CONTROL DISCUSSED

Presentation and discussion of the paper on "Budgetary Control," by H. C. Patten, was the principal business at the Friday session. An abstract of this paper will appear in a future issue. Mr. Hart pointed out the value of the budget in guiding the activities of a company. W. R. Robertson believes that it is of inestimable value, as it makes a comparison between divisions and departments.

H. E. Weyman, Levis, stated that even a small company can utilize a budget system. He finds it best to figure on the minimum revenues and maximum expenses. Then if the cost estimates are to be exceeded careful consideration should be given. The monthly figures are not of much value on the small property. If too much attention is paid to them the budget becomes unstabilized. Special expenditures are shown as extraordinary items. On the Levis property some 70 per cent of the costs are fixed, so that it is not always wise to hold to a car-mile basis.

Mr. Foster stated that he puts large expenditures into a special account and allocates them over a certain length of time.

Mr. Spencer in his estimates divides trackwork into ordinary and extraordinary expenses. The first covers the current work, while the second consists of work of large character, but which does not go into the renewal account. Postponing or advancing the work in any department will distort the budget but can be explained readily by the department concerned.

Mr. Tait is of the opinion that all companies practice some degree of budgetary control, although perhaps unconsciously. There always is an endeavor made to forecast what will take place.

OPERATING PRACTICES CONSIDERED

In past years a list of "Timely Topics" has been prepared for discussion, but the program has been so full that this year they have not been considered. In this convention the innovation was made of placing two such topics on the program each day, with two leaders assigned to head up each discussion. On the first day transfers and sweepers were considered. The discussion on transfers was led by J. McCulloch, traffic superintendent Toronto Transportation Commission, and C. M. Shaw, superintendent of transportation Montreal Tramways.

There was some controversy as to the relative value of single-truck and double-truck sweepers. Major Burpee stated that for conditions such as those obtaining in Ottawa with heavy snow the double-truck type are much better. The single-truck sweepers are satisfactory with light snow. In Ottawa sweepers have cleared as much as 3 ft. of snow. There the snow-fighting organization is lined up before winter begins. Volunteers are called for to take sweeper runs for the season. These men are relieved from their regular duties and report for snow work as soon as the snowfall begins. The pay for this is 5 cents per hour more than the regular rate. A. M. Lindsay, superintendent of rolling stock Montreal Tramways, believes the single-truck sweeper is better for all-around work. Given sufficient weight and power there are relatively few situations it will not handle.

Schedule speeds were also considered. G. E. Waller, Hamilton, believes that causes of low speed and delay should be avoided as much as possible and existing causes should be removed wherever they can. In addition to delays which can be charged against railway operation some are entirely beyond its control, while there are others over which the railway has only partial control. A. J. Tobin, superintendent Ottawa Electric Railway, told of methods used for maintaining headways on his property. His talk was illustrated with charts and time-tables from actual records.

Dipping and baking armatures was the second topic for the day. A. M. Lindsay, Montreal, holds that a good baking varnish tends to increase the life of armatures. On old armatures the penetration is small, seldom more than half the depth of the slots. Armature breakdowns are due to (1) insulation failure, caused by drying out of the insulation, (2) injury caused by vibration, (3) accumulation of moisture. Dipping and baking tightens up the coils in the slots, seals up the cracks in the insulation and dries out the moisture. All baked armatures have shown an increase in the number of miles operated per failure. Similar results are shown on other properties.

D. Chenard, master mechanic Levis Tramways, began dipping armatures in 1923, but it took a year to show the value of the practice. In 1924 there was a 5 per cent decrease in pull-ins.

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 21-25 — American Institute Electrical Engineers, annual convention, The Greenbrier, White Sulphur Springs, W. Va.

June 25-26 — New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2 — Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13 — Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

A. T. Spencer, Toronto, opened the discussion on patching of concrete paving. Unless a quick-setting cement can be used the various asphalt or coal-tar products must be used for patching. Repairs to all classes of paving can be avoided by care in maintenance. T. U. Fairlie, Hydro-Electric Railways, Toronto, does not believe in making repairs with concrete under traffic, hence some form of mastic filler is essential. Numerous steam railroads have used this method.

Car painting was discussed under the leadership of F. S. Beattie, superintendent car department Ottawa Car Manufacturing Company, and F. E. Holland, manager railway sales the Sherwin-Williams Company of Canada. Mr. Beattie stated that spray painting can be done at lower cost and gives a better appearance, both interior and exterior, than the brush method. When colors are changed, there is no practical difference in method from that needed with the brush.

Mr. Holland feels that the pleasing effect on the passengers of paint is worth more than the protection afforded the material of which the car is constructed. Many companies have adopted the spray method to advantage. With the brush three-fourths the cost is for labor, and with the spray there is a saving of 35 to 45 per cent in the total cost of painting. The correct material must be used and the method must be followed rightly. If done properly better results will be obtained with the spray than with the hand brush.

As in past years the convention was held in conjunction with that of the Canadian Electrical Association. The sessions were entirely independent, however, except for the luncheons the first two days and the banquet Thursday evening.

At the Wednesday luncheon, Dr. C. A. Eaton of the Nela Lamp Works of the General Electric Company, gave an inspiring address on the possibilities of Canada.

The luncheons on Friday were held independently for the two associations. The electric railway men were addressed by Morris Buck, managing editor ELECTRIC RAILWAY JOURNAL, who reviewed the progress that has been made during the past few years along the lines of co-ordination, and the new viewpoint of railway operators toward better merchandising and a better conception of their place in the community as purveyors of transportation.

Many excellent exhibits of railway material and buses were shown.

At the close of the convention the following officers were elected for the ensuing year:

Honorary president, P. W. Ellis, chairman Toronto Transportation Commission and Toronto Hydro-Electric Systems.

Honorary vice-president, Acton Burrows, president Acton Burrows, Ltd., and proprietor *Canadian Railway and Marine World.*

Honorary advisory council: T. Ahearn, Ottawa; E. A. Evans, Quebec; D. E. Galloway, Montreal; George Kidd, Vancouver; A. W. McLimont, Winnipeg.

President, W. R. Robertson, general superintendent of railway, Hydro-Electric Power Commission of Ontario.

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Vice-president, H. E. Weyman, manager Levis Tramways.

Treasurer, H. E. Patten, comptroller Toronto Transportation Commission.

Executive committee: The president, vice-president, treasurer, immediate past-president (W. S. Hart) and T. W. Brackenreid, Port Arthur; D. E. Blair, Montreal; F. D. Burpee, Ottawa; A. H. Foster, Brantford; G. Gordon Gale, Hull; D. W. Houston, Regina; H. K. McLean, St. John, N. B.; D. W. Harvey, Toronto; J. E. Watkins, Winnipeg; C. L. Wilson, Toronto.

C.E.R.A. Program Announced

NOT a moment will be idle on the boat trip of the Central Electric Railway Association, which constitutes the summer meeting of that body. The formal program of the sessions, which has just been announced, covers Tuesday and Wednesday mornings and Thursday afternoon. It is given below:

PROGRAM

Tuesday, June 29, 9:30 a.m.

"Developing Off-Peak Regular-Schedule Business," by Walter Draper, president Cincinnati Street Railway, Cincinnati, and Ralph Emerson, general manager Cleveland Railway, Cleveland. *Discussion.*

"The Unequal Utility Tax Burden," by Lesley Vickers, economist for managing director, American Electric Railway Association, New York. *Discussion*, by A. C. Blinn, vice-president and general manager Northern Ohio Power & Light Company, Akron.

"Why Associations?" by D. L. Gaskill, secretary-treasurer East Central Division National Electric Light Association, Greenville, Ohio.

Wednesday, June 30, 9:30 a.m.

"Electric Railway Fires; Their Cause and Prevention," by J. S. Mahan, Western Actuarial Bureau, Chicago, Ill., president Western Section International Association of Electrical Inspectors.

"The Electric Car of Tomorrow," by John A. Dewhurst, associate editor ELECTRIC RAILWAY JOURNAL.

"Maintenance as Related to Selling the Service":

From car equipment standpoint, by J. F. Uffert, superintendent of equipment New York State Railways, Rochester.

From maintenance-of-way standpoint, by Jonathan Wolfe, Chicago Surface Lines, Chicago.

From overhead standpoint, by M. W. Cooke, superintendent of current control Pittsburgh Railways, Pittsburgh.

Thursday, July 1, 3 p.m.

"Advertising for Traffic," by Labert St. Clair, director of publicity American Electric Railway Association, New York.

"How Employees Can Sell Transportation," by H. M. Lytle, vice-president Chicago, North Shore & Milwaukee Railroad, Chicago.

"Developing Excursion Bus Business," by L. H. Palmer, vice-president and general manager Fifth Avenue Coach Company, New York, and G. B. Powell, general manager Kentucky Carriers, Inc., Louisville.

While the entertainment schedule is not yet rounded out a tentative outline follows:

Monday, June 28

Buffalo to Cleveland. Preliminary contests with various ship deck games. Equipment will be available during the entire cruise for those desiring to play cards.

Dancing every evening, beginning at 9 o'clock.

Tuesday, June 29

Toledo to Detroit, and Detroit River to Lake Huron.

Cards and deck games for those not attending meetings.

Afternoon set aside to give all an opportunity to view the beautiful scenery of Detroit River, Lake St. Clair and St. Clair Flats.

Evening, after dinner, community singing led by Tudor W. Jones of the Union Traction Company of Indiana.

Entertainment to be given by the children aboard the boat, under the supervision of Miss Rowell.

Wednesday, June 30

Afternoon, golf at Mackinac Island. Sightseeing trip for non-golfers.

Immediately after dinner, mixed *South American* bridge party, one hour.

Thursday, July 1

Golf in morning at Harbor Springs.

For non-golfers, *South American* will cruise down Traverse Bay, returning to Harbor Springs about 3 p.m. to pick up golfers.

Cards and deck games for those not attending meetings.

The Carpenter-Henry birthday dinner.

Dinner community singing led by Mr. Jones.

Immediately after dinner, "C.E.R.A. Derby"; E. M. MacIntosh, official judge.

Awarding of prizes for all events during cruise.

Dancing.

Friday, July 2

Ship docked at Benton Harbor 7 a.m. to 11:30 a.m. Sightseeing Benton Harbor and vicinity.

11:30 a.m. to 3:30 p.m., Benton Harbor to Chicago.

The Motor Bus in Urban Transportation*

Co-ordination an Essential—Rail Service Should Not Be Duplicated—Extent to Which Facilities May Be Used in Common Is Discussed

BY DEAN J. LOCKE

Staff Engineer Public Service Railway, Newark, N. J.

WHY, where, when and how should motor buses be used by street railways? It is safe to say that nearly all street railway men on this continent have had these questions to consider during the past two or three years. It has been a most serious problem with most of them. There are, however, many who now believe that they have taken the problem too seriously and by so doing have postponed or lost an opportunity to serve the public and have permitted others to poach upon a well-established business.

One of the principal reasons why street railways should use buses is that they may protect their investments. If they fail to utilize this newer form of transportation, competitors may become established. That the long-established system of transportation in a community should be the one to furnish all forms of public transportation is rapidly becoming accepted as a creed of the industry. We should consider ourselves transportation men rather than street railway men, and we should welcome the opportunity and assume the obligation, where possible, to serve our public in whatever way transportation service is needed. The public buys its transportation much as it buys its other commodities, and in so doing is nearly as fickle. We are learning what the merchant has always known, therefore we must offer what the public wants or a competitor will sooner or later find the way.

Where can motor buses best be used in urban transportation? The answer is—as integral parts of co-ordinated transportation systems. There are several places where their use has been found to be of benefit to the community and of profit to the operator, as follows: Feeder, extension and crosstown connecting service; non-competing or complementary service; de luxe service; tourist and charter service.

In each of these services volume of traffic largely determines the most economical form of transportation. Where the volume is small buses may be a valuable means of handling a business which would not justify rail construction. Where the volume of business is heavy the railway remains, and probably always will remain, the most reliable, practical and economical form of transportation. The dividing line between the economic fields of utility of the two types of vehicle may vary widely as between different properties, depending on local conditions.

*Abstract of a paper presented before the Canadian Electric Railway Association, Quebec, June 2-4, 1926.

PARALLELING EXISTING SERVICE UNECONOMIC

While one large railway is today operating in parallel with its trolley lines, bus lines which were originally established by competitors and which long established public demand requires should be continued, such a system is basically uneconomic. The problem there is to fit each type of vehicle into its most economical sphere as soon as practicable and to render satisfactory services without duplication of service and expense; in other words, to co-ordinate the services.

In many cities there are areas which receive what little transportation service they have by way of circuitous trolley lines. To such places the bus offers relief by means of an operation which is complementary to the railway service.

In the field of de luxe bus transportation there are great opportunities for street railways to develop a new and distinctive class of transportation. With routes properly chosen, with the right kind of equipment and with proper service a new patronage can be built up which will in no way poach upon the preserves of the older established business or compete with trolleys used for mass transportation of passengers.

When shall street railways employ buses to round out their transportation systems? Many of us are still seeking the answer. Others of us are convinced that in our search for the answer we have waited too long and have brought upon ourselves the plague of competition. However, the best answer is that we should anticipate demands and opportunities for bus service and be the first to render such service. This does not mean that we should rush in the moment a competitor appears on the horizon, but rather that we should so cultivate public opinion that we will be sought out when legitimate needs for transportation service arise and fly-by-night operators will receive no encouragement.

The operation of buses by railways can often be undertaken to advantage when costly rail extensions of uncer-

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tain or low earning power are demanded or when the rehabilitation of branch or feeder lines becomes necessary because of physical depreciation or the improvement of adjacent highways. Another opportunity for the use of the bus arises when the operation of a trolley line becomes burdensome because of diminishing business. The substituted bus may, because of its popularity and its flexibility, build up and hold a new business of its own which the trolley never could secure.

We hesitate to abandon unprofitable rail operations because of the capital invested in the fixed rights-of-way, tracks and power generation and distribution facilities. An investment in bus equipment is not fixed in the same sense, and if a bus operation proves to be unprofitable we can abandon it and use the equipment elsewhere without loss of capital. It may be better to suffer a small loss from a bus operation installed in advance of a threatened competitive operation than to suffer a large loss by reason of the existence of the competitor.

Fields for Bus Service

How shall motor buses be used by street railways? First, careful consideration should be given to the selection of the buses themselves. They should fill service requirements and at the same time operate economically. Only the best equipment should be employed, of designs which will provide attractive accommodations for patrons, which will give uninterrupted service and which will not be expensive to operate and maintain. Buses are now being built which can handle the peak loads imposed upon them during rush hours to the extent of 125 per cent of their seating capacity, but their use is generally not justified except where the rate of fare is low and the ride is short.

Character of service largely determines the design. When buses are to be used as an adjunct to and co-ordinated with street railway service, such as in feeder, crosstown and complementary service, they should be painted the car colors and everything else possible should be done to identify them with the railway system. Bus operators should wear the same kind of uniform as the trolley operators. The railway transportation departments should control the operation of such buses.

On the other hand, where the bus service is non-competitive and is not complementary to the railway—that is, where a preferred service is offered—the buses should be distinctive in color and appearance and should be operated separately. The passenger should be made to feel that he is getting a higher class of service than is available to him on the railway bus. However, the bus chassis and body may be the same for both types of service. In fact, interchangeability and standardization of units for maintenance make this highly desirable.

Volume of traffic and frequency of service have great weight in determining the size of bus to use. On lines which have heavy peak loads with standees, the most economical size to use during the peaks is the largest capacity bus which can be maneuvered in traffic, but for many hours of the day smaller buses would be amply large. Because the carrying charges on the investment generally constitute a smaller part of the cost of bus service than of trolley service, it may pay to provide large capacity buses for use during rush hours and additional smaller buses for use during non-rush hours. Many operators find it desirable to standardize on one size of vehicle. In such cases the relative duration of the rush and non-rush periods may determine the most economical size to use. There is a definite field for the smaller bus with its lower operating costs, such as on lines where comparatively frequent headways are desirable but where the traffic is light. If the smaller vehicle is continually overloaded (a common danger) the cost of repairs, depreciation, tires, gas and oil may nearly equal that of the larger bus.

Never was the application of the old adage "a stitch in time saves nine" more justified than in connection with the maintenance of buses. Unquestionably the "stitch" is regular, frequent and adequate inspection, incorporating generous lubrication and a high standard of cleanliness. This is the everyday preventive medicine which we must give the bus if we are to keep it on the road and out of the repair shop.

But if we are to operate effectively we must organize for efficient and economical maintenance beyond inspection. On a large system it is highly desirable to have: Standardized equipment; an experienced superintendent of bus maintenance; a centrally located repair shop well equipped with machinery for the overhaul and repair of buses; a system for the rapid and careful purchase and distribution of materials and supplies; a uniform and complete system of cost accounting.

Methods for Co-ordinating Services

On almost every property, regardless of size, there are opportunities to effect economies in operating costs of both the railway and the bus branches of the business by co-ordinating the managerial, operating, maintenance, purchasing and accounting departments of the two, which would necessarily have to be self-sustaining in each company if the services were independent.

Beginning with the managerial organization, we find that the general manager of the railway, the general office staff and the various railway department heads and their staff usually absorb the direction of the bus operations, and that the total cost of these services for the two operations is but little greater than that of the railway alone. In the transportation department the degree to which bus operations may be absorbed depends largely on whether or not both trolleys and buses are operated from the same house or houses. Where buses can be operated from carhouses or near-by garages the stationmaster's or supervisor's organization can often absorb the direction of bus operators and the bus clerical work with but little increase in staff. Where the garage is distant from a carhouse, additional supervisors and receiving clerks may have to be provided.

Street railways, when adopting buses, are frequently able to utilize for housing facilities railway property which has long been idle or not fully utilized. A bay or two of a four-bay carhouse or an old power house can frequently be adapted to bus uses at comparatively small expense.

The extent to which the maintenance facilities for railway cars and buses can be co-ordinated depends largely on local conditions. Certain kinds of inspection and maintenance work employing carpenters, painters, upholsterers, farebox and register repairmen, blacksmiths, machinists, etc., are practically the same for both types of vehicle, while the electric motors, controllers, brakes, trucks and wheels of trolley cars and the engines, transmissions, axles and chassis appurtenances of buses each require a separate corps of specialists. On small properties it usually is not economical to have separate facilities and organizations for the two kinds of work, but on large properties, where hundreds of trolleys and buses are operated, it is possible and often advisable to specialize to a large extent.

Inspection work usually merits a separate personnel, even on small properties, because of the highly specialized and exacting nature of the work. Car and bus cleaning crews may be combined or not, as local conditions may demand.

The cost accounting and auditing of bus operations by street railways present few new problems, and the work is usually absorbed by enlargement of the railway clerical force.

The use of the motor bus in co-ordinated transportation is in its infancy, and much still remains to be done in perfecting its design and its operation. If properly used, it will help solve our traffic problems and some of our financial ones, and will be of distinct benefit to the public. Improperly used, it will only increase the public's and the operators' burdens.

American Association News

Merchandising Transportation

ON MAY 21 the merchandising transportation committee held an all-day session at the association headquarters in New York, editing and discussing the work of the eight sub-committees delegated to write the various chapters of the committee report. Certain sections were revised by action of those members of the committee present and it is planned to get the section into final shape immediately so that the report can be completed at the next meeting to be held in the middle of June.

Those members present were R. N. Graham, chairman; O. A. Broten, J. B. Donley, John A. Dewhurst, Ralph W. Emerson, S. E. Emmons, E. A. Palmer, Clinton D. Smith, A. C. Spurr, J. C. Thirlwall, W. H. Boyce and G. C. Hecker, special engineer of the association.

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The News of the Industry

More Trackage for Key System

Application has been made to the California Railroad Commission by the Key System Transit Company, Oakland, for permission to construct a viaduct as an approach to the Key Mole in order to afford more trackage and to speed up traffic to and from San Francisco. The cost of the new project has been estimated at $1,246,450. It is further estimated that the new plan will adequately care for 40 per cent more traffic than is accommodated under the present plan. The engineers propose to make the new viaduct 4,840 ft. long, with 10 per cent grades.

Two new main line tracks will be built, if the application is approved, to connect with the present main line tracks at a point just east of Hollis Street in Oakland and to cross over seven Southern Pacific tracks and one set of Santa Fé tracks. All four main line tracks are to be connected by right and left hand ladders at the west end of the viaduct for emergency use.

A significant feature of the proposition is that it would be useful in any new plan for a new terminal layout to Goat Island shoal or for a bridge on the Goat Island-Telegraph Hill location.

The installation of two additional main line tracks will bring about reduction in time. Under the present schedule the interval of time between the arrival or departure of the last train that connects with the same boat is seven minutes during rush-hour periods. It is estimated that with four main line tracks this interval can be lessened by at least half. This congestion of trains under the existing two-track outlet plan has long been a problem for Key system engineers. They have made an intensive study of the problem and now declare that the viaduct proposal is a long step toward the solution of it.

A normal daily movement on the six lines of the Key division and the San Francisco-Sacramento Railroad is about 400 trains to and from the mole. This number is reduced by about 100 trains by the consolidation of trains of four divisions.

Another proposal that is being studied is the proposition to "stagger" the Southern Pacific and Key ferry schedules. At the present time the schedules which are in effect are practically identical.

Richmond Common Council Overrides Mayor's Franchise Veto

Mayor J. Fulmer Bright's veto of the Virginia Electric & Power Company's blanket traction franchise was overridden by the Common Council of Richmond, Va., on June 7 by a vote of sixteen to two. The vote was taken after a fifteen-minute talk by the Mayor, which he termed a supplementary statement, and which, he said, was largely a repetition of the language used in his veto message. During his argument, he said that he was persuaded that the traction company could pay the present rate of tax and prosper without increasing its carfare. It had been done in the past, was being done now and could be done as long as present conditions obtained. He believed that if the tax rate were reduced to the extent proposed in the blanket franchise "you will face a condition which may necessarily result in making up the loss the city will sustain from other sources and other taxpayers." The issue now goes to the Board of Aldermen for concurrence.

St. Louis Files Answer to Fare Request

City Counselor Suggests Deferment of Increased Fares Until Completion of Present Transfer Negotiations—Receiver Wells Explains Decrease in Traffic

THE 8 per cent return on the fare basis valuation of United Railways, St. Louis, Mo., is an excessive demand, higher than the return allowed electric railways in other cities and quite unwarranted by the present condition of the money market, City Counselor Muench of St. Louis informed the Missouri Public Service Commission in an answer of the city protesting the granting of an application made by Receiver Rolla Wells for an increase in fare to 8 cents, two tokens for 15 cents. The present fare for adults is 7 cents straight. The protest was sent to Jefferson City on June 5. Receiver Wells filed his application on June 3.

Counselor Muench said that the injury and damage reserve of 9 per cent of gross receipts was much beyond the reasonable amount that should be set aside for that purpose, and before allowing such a percentage the commission should make a careful investigation to determine to what extent such heavy damage claims are the result of bias or lack of sense of civic obligation. The unfavorable showing in the company's financial status for 1925 compared with other years and with the first four months of 1926 indicates that the maximum inroads on the business of the company have passed and the present business has taken a favorable turn, according to the city.

Mr. Muench further points out that in the very near future the United Railways property will be transferred to the reorganization committee's St. Louis Public Service Company and that this change will strip the company of various legal hamperings and make for an elimination or reduction of certain fixed charges and for greater economy. In view of this fact he terms the grant of an order for a fare raise "inopportune and illegal." If a fare raise is found to be absolutely essential it should only be granted after the reorganization of the company and the transfer of the railway property have been completed and the financial affairs of the St. Louis Public Service Company adjusted and stabilized.

Continuing, Counselor Muench asserts that the reason for the deficit of $207,000 experienced by the company last year does not lie with the lines in the city, but was caused by the nonpaying offshoots of the city lines, and that it would be manifestly unfair to place upon the city car riders the burden of carrying the expense of arteries that stretch into the county and cause red ink entries on the company books. Attention is called by him to an item of $4,891,032 which is said to represent the net amount of the company's investment alleged to have been made for betterments and additions of the property between Jan. 1, 1919, and April 30, 1926. He contends that this is in excess of the amount.

In concluding his reply Mr. Muench again asks for an audit, even though the commission should decide that the company is entitled to an immediate increase in fare; he urges this so that a true value of the company's property may be established to form the basis of the finding the commission will be required to make in connection with the service-at-cost franchise now being negotiated by the city and the reorganization committee.

In his application for the increase Receiver Wells asked for immediate action by the commission and that the fare of 8 cents, two tokens for 15 cents be effective not only in the city but in each of the St. Louis County fare zones. Receiver Wells made his application with full authority from United States District Judge Faris, who has jurisdiction over the receivership.

United Railways officials have estimated that the increase if granted will net the company upward of $1,200,000 additional revenue annually. For the year ended April 30, last, the net income was $2,748,000, or about $1,200,000 of the amount required to pay a 7 per cent return on the $56,600,000 valuation fixed on the company's property by the Public Service Commission. However, no rate of return on this valuation has ever been fixed by the commission, and in his application Receiver Wells asked for an 8 per cent return, which would require upward of $2,000,000 a year more revenue.

Receiver Wells issued a statement to

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explain to the public his request for a higher fare. He cited a large decrease in the number of revenue passengers due to the increased use of private automobiles and competition of buses and service cars. He said the number of passengers in 1924 was approximately 13,500,000 less than in 1923 and in 1925 9,100,000 less than in 1924.

This combination of decreased income and increased expenses "makes it impossible to maintain the high character of service desired, make further improvements in service and pay a reasonable return on the valuation of the property allowed by the Public Service Commission and agreed to by the city and the receiver."

"In view of this situation the receiver has felt it necessary, in connection with the property maintenance of the service and in protection of the equities in the property, to apply to the Public Service Commission, and he has been instructed by the United States court to apply to the Public Service Commission for increase in fares to a basis of tickets at the rate of 7½ cents and single cash fares of 8 cents. However, he is not now asking for an increase in the present children's fare of 3 cents," Receiver Wells' statement concludes. In view of the action of Receiver Wells it is considered probable that Mayor Victor J. Miller will immediately give out for public consideration and discussion the new service-at-cost franchise under which the St. Louis Public Service Company will operate when it takes over the street car property, in the hope that the public may help to decide on points now in controversy. Briefly, these are: Whether franchise shall regulate terms and conditions under which the company will employ its workers, especially carmen; whether the use of one-man cars shall be prohibited on lines entering the congested districts of the city; whether the mill tax and present franchise taxes shall be continued, and what rate of return the company shall be permitted to earn on both its present investment and further investments for extension of service.

Appropriation for Loading Platforms in Chicago

Substantial appropriations for the establishment of street car loading zones in every section of Chicago have been recommended to the city finance committee by the local transportation committee of the City Council. The action came after traffic experts had reported that present facilities for loading trolley riders safely were inadequate. A representative of the Chicago Surface Lines offered similar testimony and strongly urged the establishment of safety islands. He opposed the construction of elevated zones, especially in the Loop district, as a hindrance to heavy vehicle traffic.

The tentative plan of the committee's engineers for making zones is to install strips of 1-in. yellow rubber vulcanized under enormous pressure upon steel plates ¼ in. thick and imbedded in the road flush with the level of the pavement. It was declared that the rubber will withstand wear much better than enamel or other materials.

Ordinance Introduced Before City Council

Proposed Franchise for Kansas City Incites Kansas City, Kan., Mayor to Express Views on Equal Consideration—Public Will Be Invited to Hearings

IN ORDER to bring the matter of a new street railway franchise to the point of public discussion, the application for a new 30-year franchise, as submitted to the city manager recently by William G. Woolfolk, president of the Kansas City Public Service Company, Kansas City, Mo., was introduced into the City Council in the form of an ordinance on June 7 in the name of Councilman A. N. Gossett. Mr. Gossett said the franchise is one of the most important questions confronting the city government and thought the introduction of the bill at this time proper in order to allow its discussion by a Council committee and in public hearings. He said:

> Public hearings on this matter are a necessity, so that some plan resulting in the introduction of an agreeable ordinance may be reached. If the Council finds that the ordinance is not right, or that the franchise should be granted by the people, then I would not be for this ordinance.
>
> However, I believe the matter is one that should receive the serious consideration of this Council.

The public will be invited to attend the informal hearings by the Council.

It is rumored that the Kansas City Public Service Company, the successor under reorganization to the Kansas City Railways, will meet with quite a little opposition in the matter of the ordinance as introduced. Several Democratic Councilmen were on hand at the introductory meeting for the purpose, it is said, of killing the bill without public hearings. This plan was sidetracked, however, in favor of public hearings.

Company Has Complied with New Terms

Mr. Woolfolk said that several times recently the statement has been made that the Kansas City Public Service Company, the successor to the Kansas City Railways, should not ask for a new franchise until the company has complied with the provisions of the present grant. "I have made a close study of what the old company has done," he said, "in the way of complying with its franchise requirements and I believe in all fairness it should be made public. Our books are open to prove all I state."

Mr. Woolfolk, in this connection, recently issued a statement wherein was set forth a number of figures showing the manner in which the old company has more than complied with the terms of the present franchise, especially in the matter of extensions to the Missouri property of the company, the purchase of new cars within the stipulated periods and the full provision of $250,000 which should be available for further extensions deemed necessary by the city. The text of the statement admits the failure of the old company to comply fully with the provision requiring full maintenance of the paving between the car tracks. Mr. Woolfolk said that his company stands ready to remedy that condition, which he justifies in the face of the financial difficulties into which the old company found itself within a few years after the present franchise was granted.

According to the statement, the ordinance further provided that if the net earnings of the company in the aggregate exceeded, or were less than 35 per cent of the gross receipts of the company in any year, then the amount to be expended in extensions and additions to the property should be increased or diminished correspondingly, and that an analysis of the company's earnings and expenditures in extensions up to Dec. 31, 1925, shows the capital additions to the company's property in the period amounted to approximately twice the franchise requirement.

Old Objections Revived

H. F. Schaible, acting Mayor of Kansas City, Kan., said that this city must receive equal consideration with Kansas City, Mo., in franchise negotiations with the new operators of the railways. He announced that he will ask the commissioners to call a conference with officials of the Kansas City Public Service Company and of the Kansas City Railways for consideration of the proposed franchise.

Mr. Schaible is quoted as saying that not a line of track had been extended in Kansas City, Kan., for more than ten years, and virtually every request for adequate service and routings that would benefit Kansas City, Kan., had been ignored. He said thousands of laborers working in the central industrial district were forced to walk blocks to and from work as a result of the abandonment of the "L" road.

Several of the objections voiced by Mr. Schaible have for several years formed the chief bones of contention between the Kansas City Railways and the officials of Kansas City, Kan., the latter having fought the granting of articles of incorporation to the Kansas City Public Service Company by the Kansas board at the time such approval was requested. The objections at that time, however, were over-ruled by the board after company officials promised to do everything possible in coming to a satisfactory agreement with the city officials and public in the matter of service, fares and equipment.

Sandston Electric to Operate in Virginia

The Sandston Electric Railway, Richmond, Va., with a capital stock of from ten shares to 50 shares without par value, has been granted a charter by the Virginia Corporation Commission to operate a street railway at Sandston, Va., about 5 miles northeast of Richmond. The incorporators are Oliver J. Sands, president of the American National Bank & Trust Company, president; J. B. Bourne, secretary. Other officers are J. A. Baird, Samuel W. Zimmer, Petersburg, Va.; Oscar E. Parrish and Robert M. Sharp, Richmond, Va.

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Litigation Ends in Shreveport

Court Rules Company May Charge Straight Seven-Cent Fare—Details in the Long Battle Reviewed

The United States District Court, Eastern District of Louisiana, handed down a decision recently declaring null and void and confiscatory the order of the Louisiana Public Service Commission, rendered on March 16, 1925, ordering the Shreveport Railways, Shreveport, La., to offer seventeen tickets for $1 and four tickets for 25 cents. The new order authorizes the company to discontinue the sale of four tickets for 25 cents and seventeen for $1, and to charge 3½ cents a ride for school children during school terms and school hours. The court also ordered an injunction restraining the Louisiana Public Service Commission, Huey P. Long, chairman of the commission, and other members from attempting to enforce the said order of March 16, 1925, or from interfering in any way with the plaintiff in charging and collecting a 7-cent fare on the street railway systems and a 3½-cent fare for school children who are under the age of eighteen years.

This decision ends litigation which has been carried on for some three years between the Shreveport Railways and the courts. A review of the preceding events is necessary for a proper understanding of the situation in that city. The Shreveport Railways has been fighting for the principle of operation with a profit instead of a loss, and has from time to time applied to the Public Service Commission for relief. In January of this year the company asked to be relieved of the sale of tickets and to be allowed to charge a flat 7-cent adult fare and 3½-cent, or 35 cents for ten tickets, school children rate. The application included a statement of the company showing a deficit of $2,987 for the year, allowing nothing for a return on the value of the property. The commission did not grant a hearing until April 26. After the hearing the chairman stated the case would be continued indefinitely.

A delay of three months with losses continuing monthly compelled the Shreveport Railways to apply to the United States District Court for an order restraining the Public Service Commission from interfering with the railway in discontinuing the sale of adults tickets seventeen for $1 and four for 25 cents and granting the railway the right to charge all adult passengers a 7-cent fare and ten school tickets for 35 cents.

Trouble began in Shreveport in July, 1923, when the United States District Court for the western district of Louisiana granted the Shreveport Railways an injunction against the Louisiana Public Service Commission restraining it from interferring with the company in the collection of a 7-cent cash fare. In November of the same year a committee of Shreveport citizens prevailed upon the Shreveport Railways to withdraw its suit in the United States District Court and accept an order of the Louisiana Public Service Commission fixing the fare of 6 cents for adults and 2½ cents or ten tickets for 25 cents for the school children. This was done with the understanding that if this rate of fare did not yield a fair return on the property the commission would increase the rates. After one year's test of this rate of fare it was found that the earnings did not yield a fair return. The Shreveport Railways, therefore, made application to the Public Service Commission for an increase in fare to 7 cents for adults and 2½ cents, or ten tickets for 25 cents, for school children.

In March, 1925, the Public Service Commission issued an order fixing the cash fare at 7 cents, but required the company to sell tickets seventeen for $1 and 4 for 25 cents. The price of school tickets remained unchanged. The Shreveport Railways did not feel that this rate would yield a fair return, but it agreed to try the arrangement and see what the results would be. The earnings under this arrangement dropped off immediately and it found it was operating at a loss each month.

Another angle to the dispute is the 1907 ordinance requiring a motorman and a conductor on each car operated in Shreveport. Some ten years later, after the one-man safety cars had passed the experimental stage, the railway contested the right of the city to enforce this ordinance. The case went to the Supreme Court of the State and to the Supreme Court of the United States, where it was held that the ordinance was a police regulation and the courts did not at that time feel justified in interfering with it. Since that time the railway has secured a modification of the ordinance so as to permit one-man safety cars on two of its lines.

64 per Cent of Cleveland Shoppers Use Street Car

Three-fourths of the shoppers in Cleveland's downtown Euclid Avenue stores make the trip from their homes in street cars or buses operated by the Cleveland Railway. This is shown by a traffic survey conducted by the Cleveland Railway and the retail merchants' board of the Chamber of Commerce.

Less than 4 per cent walk to the stores, a little more than 21 per cent come in their own automobiles, more than 64 per cent come by street cars and a little more than 10 per cent by buses.

According to Ralph W. Emerson, general manager of the railway, the poll was perhaps the largest of its kind ever taken in this country. It was conducted in the downtown Euclid Avenue stores.

Mr. Emerson is inclined to believe that thousands from the poorer neighborhoods failed to vote or refused to do so, and that they would show an even higher percentage of car riders. He also believes that shopping districts away from Euclid Avenue probably would show more car riders. A total of 93,355 persons voted in the poll.

William H. Gray, secretary of the retail merchants' board, declared the survey showed the buying public depends principally on the Cleveland Railway for transportation.

Utica Fare Hearings Concluded

Hearings were completed by the Public Service Commission on June 10 upon the petition of the New York State Railways for permission to increase fares in its Utica zone. The city of Utica was given until June 21 to file a brief. Counsel for the company stated that no brief would be filed by it.

After cross-examining engineers of the company concerning their appraisal of the Utica zone property, the city of Utica opened its case by presenting Dr. Milo R. Maltbie, consulting expert, and two members of his staff. The city claimed a reproduction cost of the property in the Utica zone as of Sept. 30, 1925, of $3,854,255, from which there was deducted for depreciation $1,462,823, giving a net reproduction cost less depreciation of $2,391,431. This figure is exclusive of overhead costs.

At the last hearing the engineers of the Public Service Commission estimated the reproduction cost as of Sept. 30, 1925, at $5,325,517 without depreciation and at $3,359,384 after depreciation had been deducted.

Surface Lines Head Attacks Proposed Traction Ordinance

Taking exception to the opinion expressed by Francis X. Busch, corporation counsel of the city of Chicago, in an address before the Chicago Association of Commerce (referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 5, page 988), Henry A. Blair, president of the Chicago Surface Lines, in a letter to the chairman of the City Council committee on local transportation on June 9, declared that the question of subway construction should be settled before any attempt is made to draft new traction ordinances. Mere unified operation of the surface and elevated lines could not materially improve service until congestion in the Loop district had been relieved by subways. Mr. Busch had previously stated that subway construction could not be undertaken until other phases of the traction problem had been thoroughly investigated and acceptable ordinances drafted.

As to the proper method of financing subway construction, Mr. Blair said that subways should be built by the city because the cost of construction was too great to be met out of earnings of the transportation company without considerably increasing the rate of fare. Earnest consideration should be given the question of whether the present law with reference to special assessments needs clarification or enlargement. Consideration should also be given to the restriction in the present law which prohibits the city from leasing subways for a longer period than twenty years.

Mr. Blair asserted that before the ordinances be made effective they must be submitted to a referendum vote of the people. But even if the people should give their approval, legislation must be then obtained which will compel the state to surrender to City Councils all regulatory power, which will validate the removal of the present twenty-year limitation of the right of cities to issue grants to street railways.

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District Commission Wants Information on Suggested Merger

Another request from the Public Utilities Commission as to what progress, if any, has been made toward a merger of the two transportation systems of the District of Columbia has been sent to the Capital Traction Company and the Washington Railway & Electric Company. Indicating that further delays might result in indefinite postponement of negotiations, the commission in a letter to both companies said:

> In view of the short time intervening between the adjournment of Congress and the present time, the Public Utilities Commission desires to know what progress, if any, has been made toward the proposed merger of the two railways since the last congressional hearings on this matter.
>
> This information is asked because the commission believes not only that it is necessary because of its possible influence on future actions of the commission, but also because it is felt that the Senate and House district committees should receive this information before the present session of Congress adjourns.

John H. Hanna, president of the Capital Traction Company, said that officials of his company had conferred with the North American Company, large stockholders in the railway.

William H. Ham, president of the Washington Railway & Electric Company, declined to comment on the letter.

Council Refuses Ten-Cent Fare in Atlanta

The request of the Georgia Railway & Power Company for a 10-cent cash fare, relief from the gross receipts tax levied by the city and permission to charge 2 cents for transfers was denied on June 7 when the City Council, by a vote of 22 to 2, adopted the report of the special committee appointed to study the "special relief petition" filed by the company two years ago. The Council recommended, however, that the charter of the city of Atlanta be amended by the state Legislature at its next session so that paving costs chargeable to the street railway may be fixed upon a basis of 12 ft. instead of 16 ft. for double-track and 8 ft. instead of 12 ft. for single-track lines, which the company is now paying. It was further recommended that the maximum paving costs chargeable to the company for the year 1927 be fixed at an amount not to exceed $75,000 and that at the beginning of each year hereafter a maximum amount be fixed by the proper authorities so that the railway may know the amount it will be required to pay.

The refusal of the City Council to allow a 10-cent cash fare with a 2-cent charge for transfer does not, however, mean that this relief cannot be obtained. The Council simply considered that changes in fare should be made by the Public Service Commission, and left it up to the company so to petition before the proper authorities.

Out of the seven requests contained in the original petition, made by the Georgia Railway & Power Company two years ago, three have been granted, three may possibly be granted in the near future and only one has been denied. Requests granted have been the elimination of unfair jitney competition, permission to reroute many cars and eliminate many stops in the interest of speeding up service, and more rigid enforcement of the city's traffic regulations. The three requests which have not yet been granted, but on which the way has been left open, are those for reduced paving costs, a 10-cent cash fare and a 2-cent charge for transfers. The only request thus far specifically denied is that for relief from the gross receipts tax levied by the city.

Baltimore Hearings Concluded

The Maryland Public Service Commission has completed its public hearings on the proposed rerouting of a number of the street car lines in Baltimore operated by the United Railways & Electric Company. The commission gave three days to hearing both sides of the subject and has taken the case under consideration.

Changes in the car routes were recommended by Kelker, DeLeuw & Company, Chicago engineers, who made a survey of the city. These recommendations were approved by the Baltimore Traffic Survey Commission, which, in turn, submitted them to the Public Service Commission with the request that the United be ordered to make the proposed changes. It was on this request that the Public Service Commission held open hearings. These were attended by representatives of numerous merchants' associations which opposed the removal of street cars from some of the business streets. The merchants also submitted an alternative plan, which proposes that certain changes be made in routing.

H. D. Potter, general manager of the United, testified at the hearing on the closing day. He pointed out that the company is in accord with the Traffic Survey recommendations with the exception of some details. A statement also was made by Charles D. Emmons, president of the company. He pointed out that the company said last year when the valuation case was under consideration that it would try to work out its financial problems under the existing 7½-cent fare, and although it has prospered there has not been sufficient leeway to permit large expenditures for rerouting unless there is assurance that the changes will be advantageous to both the company and the riding public.

When the hearings were opened on June 1 representatives of several merchants' organizations were present and protested the proposed changes in several of the routes that had been recommended by the report. C. D. Emmons, president of the United, pointed out that the rerouting would not result in any great savings in operating costs.

Explanation of the good to result from adopting the proposed changes was presented by Major R. F. Kelker, Jr., of the Chicago engineering company. He also cited the advantages of the removal of car lines from certain downtown streets.

The Baltimore Traffic Survey Commission adopted the vehicular traffic survey report as a tentative plan.

Under the plan as adopted by the commission all parking in the downtown business section of the city would be eliminated between 7:30 and 9:30 a.m. and 4:15 and 6 p.m. daily except Saturdays and holidays. It is recommended that parking be prohibited between 12:30 and 2:30 p.m. on Saturdays. Recommendation also is made that parking be prohibited during the rush hours on some of the streets leading into the business section, only the side of those streets affected by the greater flow of traffic being involved.

Angular and perpendicular parking during the day on streets less than 60 ft. wide in a large part of the downtown section is opposed.

It is said that the territory exempted in the business section will provide parking space for the parking of 2,000 cars during the rush hour and 5,000 at other times.

The report of the experts making the survey also recommends that a number of streets or portions of streets be made through streets, before entering or crossing which automobiles would be required to come to a full stop.

P.R.T. Now Aids Its Stricken Foe—the Private Automobile

Under the guerdon of the Philadelphia Rapid Transit Company, the Yellow Cab Company, Philadelphia, is entering the towing business. Killing two birds with one stone, the company is making use of a number of old taxi bodies remodeled for this purpose and is at the same time establishing a new criterion for comprehensive transportation service in the city which it serves. So far as is known, there has been no example in this country prior to this new departure on the part of the Philadelphia company of towing service in which standard meter rates have been affixed. It is hoped to drive the towing "pirate" off the street with the Yellow service provided by the P.R.T.

Six of these towing trucks have been placed in service. They are stationed in various parts of the city so that rapid response to calls may be made at any hour of the day or night. Crippled cars will be towed to any point designated by the owners or drivers. The meter flags are thrown as soon as the towing truck reaches the car. It remains down in a recording position until the car has been landed at its destination and the towing truck dismissed. The charge for the first mile or fraction thereof is $2, each additional mile or fraction thereof is charged for at the rate of 50 cents, while waiting time, each ten minutes or fraction thereof, impresses another charge of 50 cents.

It is of course necessary for the Yellow Cab division of P.R.T. to keep towing trucks on hand for servicing disabled cabs and the public towing service started recently makes it possible greatly to reduce overhead charges by providing for the trucks a service more or less continuous. In a leaflet issued by the Yellow Cab Company, dealing with the new towing service, it is stated that as the volume of towing business increases rates for the service will be reduced. Even at the present time, however, it is claimed that the rates are lower than those of any other towing medium in Philadelphia.

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Survey Shows Bus Is Not Replacing Electric Railway

Lucius S. Storrs, managing director of the American Electric Railway Association, states that buses are increasing the local transportation service throughout the United States, but not supplanting electric railway cars in any marked degree. The traction companies are rendering 15,000 miles more service today than six years ago and adding 5,500 buses and 2,658 cars. Since 1915 buses have supplanted only about 2,000 miles of track, mostly in sparsely settled sections. More than 300 electric railway companies are utilizing the bus in the place where it belongs—that of giving supplementary service. Routes operated embrace more than 12,250 miles with some 6,000 buses. Most of this service is over new routes. Electric railways during the last year carried approximately 16,000,000,000 passengers, or about 43,000,000 a day.

At best all of the buses, including the 6,000 run by electric railway companies, probably carried one-eighth as many riders as the electric lines. There is no indication that the electric lines are going to be seriously affected in urban centers by the bus, but there is every indication that the electric railways will continue to use the bus as a helpful supplemental agency. The fact that no city of more than 50,000 is being served exclusively by buses proves the necessity for the street car.

Demands of Indianapolis Men Announced

Harry B. Dynes of Indianapolis, a commissioner of conciliation of the United States Department of Labor, has been assigned by the department to observe the street car situation in Indianapolis, Ind., following reports that some employees were considering a call for a strike.

Word of the appointment was received following a meeting of approximately 500 employees of the Indianapolis Street Railway.

John M. Parker and Robert Armstrong, the association organizers, attended the meeting, but did not address the employees. They had been enjoined by Judge Robert C. Baltzell of the United States District Court from continuing their organization work which in any way interfered with employees.

Demands of the association have been placed before company officials, it was said by Mr. Barker. Their demands call for an increase in wages, reinstatement of several men said to have been discharged by the company because of their allegiance to the labor organization and settlement of all disputes between employers and employees by arbitration.

The wage scale sought is as follows: For the first three months, 55 cents an hour; next nine months, 60 cents an hour; after first year, 65 cents an hour. An additional 5 cents an hour to the regular scale is asked for men employed on one-man cars and buses. The present scale of wages is 37 cents an hour for the first year, with an increase of 1 cent a year for five years, after which there is no change.

The demands would have all labor disputes first discussed in conferences; this method failing, arbitration by a board selected by both parties would be called into play.

James P. Tretton, superintendent of the car company, said that the scale demanded by the union would mean approximately $2,000,000 a year increase in wages for the company.

News Notes

Will Run Mozart Line Another 30 Days.—The City Council of the city of Wheeling on May 25 voted to permit the Wheeling Traction Company to operate the Mozart Park traction system for an additional 30 days pending a report of the franchise committee. The time extension becomes effective on June 15. The Wheeling Traction Company assumed operation of the line when it was abandoned by the Wheeling Public Service Company, at which time it was suggested that the line be taken over for a test.

Seeks Fare Increase. — The Denver Tramway, Denver, Col., is seeking permission of the Public Utilities Commission to increase its rates between Denver and Arvada to 50 rides for $2.25 because an improvement in service has been sought by the patrons. Some time ago, in an effort to stimulate riding between Denver and Arvada, the company reduced the rate from Lakeside, the city limit of Denver, to Arvada, making the fare 50 rides for $1.66. The line was not used enough to justify the running of one car every hour.

Injunction in Favor of Railway Continued. — United States Judge W. C. Lindley at Danville, Ill., on June 5 continued the temporary injunction granted the East St. Louis Railway against the city of East St. Louis, Ill., and city officials restraining them from tearing up the company's tracks on Third Street between Broadway and Missouri Avenue. Judge Lindley set the final hearing for June 25, at which time the court shall determine whether the city of East St. Louis or the Illinois Commerce Commission has the authority to renew the franchise for the tracks in question. The old franchise expired at midnight May 31.

Wage Agreement Renewed. — The Toronto Transportation Commission, Toronto, Canada, concluded an agreement on April 17 with its platform employees for two years from April 1, similar in all important respects to that in force during the two preceding years. The request of the employees for two weeks holidays was refused on the ground that employees paid at an hourly rate and in receipt of additional pay for overtime were not, as a rule, granted holidays with pay.

Contract Renewal Prevents Wage Cut.—An amicable settlement was arranged recently between the Amalgamated employees and officials of the Michigan Electric Railway, Jackson, Mich., by which the men have agreed to work for the next two years under the same contract that has been in force the past two years. The rate of pay that they will continue to receive is 49½ cents an hour for interurban motormen and conductors for the first six months and 54½ cents an hour thereafter; 44½ cents an hour for the motormen and conductors of the two-man city cars for the first year and 47½ cents thereafter; 49½ cents an hour for the one-man city car operators and bus drivers for the first year and 52½ cents an hour thereafter. The union had demanded 5 cents an hour increase in payment, time and a half for overtime and the inclusion of the bus operators of the Southern Michigan Transportation Company under its charter. The status of the bus operators, decided by arbitration, was discussed in the ELECTRIC RAILWAY JOURNAL, issue of May 22, page 902.

Ordinance Provides for Experts in Fare Case.—The Albany, N. Y., Common Council has passed an ordinance authorizing the employment of experts, engineers and accountants to assist in the preparation and presentation of the city's case in the matter of the application of the United Traction Company for an increased rate of fare. The sum of $35,000 was appropriated.

Detroit Wage Conferences Not Scheduled.—No definite date has been set for the conference between officials of the Department of Street Railways, Detroit, Mich., and officers of the street railway men's union on the proposed new wage scale and changes in working conditions submitted by the men recently. It is understood that the matter is being held in abeyance pending investigations being made by accountants for the Detroit Street Railways to determine just what the demands made by the men mean in increased costs.

Commission Hears Higher Fare Petition.—The Missouri Public Service Commission at Jefferson City, Mo., on June 3 heard testimony for and against the granting of the application of the Hannibal Railway & Electric Company, Hannibal, Mo., for authority to increase its fare from 6 cents to 8 cents with two tokens for 15 cents. The commission was told that the company is operating at a loss under the present 6-cent fare, that buses have made considerable inroads into company revenue and the increase sought is absolutely necessary if the company is to continue operations and obtain a fair return on its investments. The petition of the company was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 29, page 945.

Men Seek Increase in Wages.—The carmen in the employ of the Eastern Massachusetts Street Railway, Boston, Mass., have asked for an increase in wages of 16 cents an hour, a wider spread in the differential for the one-man car operators and a reduction of the working day to eight hours. The present rate is 61 cents an hour for motormen and conductors on two-man cars and 66 cents an hour for operators of one-man cars. There have been several conferences over these demands, and the matter is to be submitted to a special arbitration board within a few days. A year ago the men received an increase of about 3 cents an hour.

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Foreign News

British Service Normal

General Working Agreement in Effect Prior to Strike Succeeded by Variety of Local Settlements

All over Great Britain tramway and bus services were restored to normal within three or four days after the end of the general strike. Here and there delays were caused by settling the terms of reinstatement. In many towns the tramway and bus authorities, with the aid of volunteers, were able to maintain skeleton services during the strike, although in certain places there was practically complete stoppage. In the case of some of the smaller undertakings the employees did not belong to a trade union and the services were uninterrupted.

When the strike was called off municipalities and tramway companies were of course anxious to restore their services as soon as possible and the employees were just as keen on getting back to work. Hence with the least possible delay agreements for re-engagements of men were entered into, differing, of course, somewhat in different places. The general scheme hitherto in operation as fixed by the National Industrial Joint Council for the tramway industry thus came to an end.

No meeting of this joint council was held to consider the new situation, however, until most of the local arrangements had been completed. When the meeting did take place the representatives of the employees admitted that in striking, the men had ignored the national council and had broken the national agreement. The employers' representatives announced that the council could continue in action if the employees' representatives would agree (1) that they would not give instructions to their members to strike without previous negotiations and without giving three months notice; (2) that they would give no support to their members who acted without authorization; (3) that they would not allow supervisory and clerical staffs to be members of their union; (4) that the reinstatement of employees should be left to each local authority for settlement; (5) that neither the employers' representatives nor the employees' representatives on the council should be subject to any interference by any other organization.

After much discussion the employees' side would not agree to item 3 and there was also a difference of opinion on item 4. The meeting broke up with a declaration from the employers that for the present the council had ceased to function.

A report submitted to a meeting of the London County Council on May 18 revealed the exact terms of settlement with the Council's tramway employees. As this is the largest tramway undertaking in the country, a summary of terms is of interest. They include the re-employment of all men, but not necessarily reinstatement in their former positions; the men to be re-engaged as soon as circumstances permit; an understanding that the volunteers remaining in the service will not be interfered with; no general alteration in wages and conditions of service; the Council not to undertake to re-engage men convicted of creating disturbances, but each case to be considered on its merits by the general manager. The Council decided to grant three additional days holiday with pay to each member of the staff who remained at the disposal of the Council during the emergency.

Lord Ashfield, chairman of the companies and of the London General Omnibus Company, has since addressed a letter to all volunteers who helped the companies, thanking them for their able and diligent service. The companies also thanked the general public for the good will and encouragement which it extended to the 10,000 men and women who were engaged in re-establishing the London transport services. During the emergency the trains, buses and tramcars in the group ran 750,000 miles and carried more than 4,000,000 passengers.

Australian Roads Face Serious Problems

Absorption of Private Buses by Municipal Tramways Debated—Forty-four-Hour Week Legalized

Transit conditions in the larger Australian cities are unsettled. The difficulties which the electric railways face are much the same as those which have prevailed in the United States in recent years. Bus competition and hours of labor loom as big problems at the present time.

A brief historical sketch of the situation is necessary for full understanding. Electric service was first established in New South Wales in Sydney in 1899. Until 1914 the tramway traffic steadily increased. Since that time, however, no funds have been allotted for extension of lines. In May, 1924, there were in this state 251 miles of track, over which 1,417 cars were operated. Because no money was available for extensions, it was proposed some time ago that bus service be started. So far nothing has been done by the municipality along these lines. More than 200 private buses now compete with the rail service and have caused heavy loss to the tramways. A law recently was passed to limit work to 44 hours a week and a reduction of fares is now being discussed. Thus it appears that some definite action must be taken in the near future to put the transportation service on a more stable basis.

Sydney has a difficult traffic problem, particularly during two weeks at Easter time each year, with an agricultural fair and races, and during the Christmas and New Year holidays. Intermittently there are other rush seasons as when the Royal British Naval Squadron or the American fleet is in port. During these periods provision must be made for special power supply, an increase in traffic men, superintendents, etc. A particularly difficult problem has arisen lately in connection with the Speedway, which accommodates about 50,000 people and which is inadequately provided with transportation facilities.

Brisbane, the capital of Queensland, has a zone system of fare collection, each section averaging 1 mile in length and the fare 1d. The system originally was operated by an American company, but was later taken over by the government, and about the middle of last December control passed to the Greater Brisbane Municipal scheme. A 44-hour week has been in effect in Brisbane for some time past and the tramways are now seeking increased fares. From the failure of this system to operate successfully with a 44-hour week and 1d. fares, it may be presumed that a similar scheme would be unsuccessful in Sydney.

In Melbourne, in the state of Victoria, the transit problem has been somewhat relieved by the extension of electric lines, including the electrification of a number of suburban steam railways. On Feb. 1, 1925, the motor omnibus act came into effect there, putting the control and regulation of bus traffic under the supervision of a committee appointed by the government. This committee consists of a chairman and four other members including representatives of the municipalities, the railways department and private motor bus owners. The board applied for permission to operate buses on five routes, but only one was granted, the Minister being of the opinion that the other routes should be reserved for private operators. Prior to this, in January, 1925, bus service had been started by the municipality on one suburban route. A short time ago, at the request of the Minister of Public Works, the loading of the buses was limited to the seating accommodations and measures were taken to prevent overcrowding at rush hours. This reduced the earnings, and the revenue fell to about 15d. (30 cents) per bus-mile. Considerable opposition has developed to the plan of municipal bus operation. This appears, however, to be based largely on a misconception concerning the place of the bus in the transportation field.

Added to this is a somewhat disconcerting bill recently passed establishing a 44-hour week to be worked as far as possible on five days. This, of course, cannot be applied to the transportation services, but all other industries will be obliged to conform. The 44-hour week is made compulsory, and there are severe penalties in the shape of overtime rates. In the transportation department alone at least 300 additional men will be needed by the tramways. The effect of the five days operation is expected to decrease the passenger revenue seriously because department stores and factories formerly were open for half a day on Saturday. All this travel will be lost and the only traffic available will be the pleasure seekers during the week end. The additional expenses to the tramways are estimated at £180,000 a year without any compensating revenue.

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Recent Bus Developments

California Registration Act Unconstitutional

The California motor vehicle registration law was held unconstitutional by the Supreme Court of the United States as it was applied to the Frost & Frost Trucking Company by the Supreme Court of California. The trucking company was a private carrier operating over California highways. It was forbidden by state authority to continue operations unless it obtained a certificate of public convenience and necessity and became a common carrier subject to the regulation imposed on that class of carriers. The Supreme Court of California held that the state had the power to require as a condition precedent to operation over its highways that private carriers obtain certificates as common carriers.

Justice Sutherland, delivering the opinion of the court, said it was not controverted that a private carrier could not be converted against his will into a common carrier by mere legislative command. As applied by the California court, Justice Sutherland held, the law violated the rights of the trucking company as guaranteed by the process clause of the fourteenth amendment, and "that the privilege of using the public highways of California in the performance of their contract is not and cannot be affected by the unconstitutional condition imposed."

The significance of this decision as applied to New York State is that a new transportation corporation law was enacted by the last legislature which declares that a corporation organized to establish, maintain and operate for the public use any stage, omnibus or motor vehicle route or routes for the conveyance wholly within or partly without this state of persons or property is a common carrier as defined in the public service commission law.

Stage Line Between Logan and Utah-Idaho State Line

The Utah-Idaho Central Railroad, which operates an interurban line between Ogden, Utah, and Preston, Idaho, has been granted a certificate of convenience and necessity by the Public Utilities Commission of Utah to operate an automobile stage line for the transportation of passengers and express between Logan, Utah, and the Utah-Idaho state line and intermediate points.

In its application for a permit the Utah-Idaho Central Railroad pointed out that it had invested more than $5,500,000 in its railroad system, and during the winter months it would discontinue its bus service. The decision of the commission pointed out that the commission, whenever practicable, favors co-ordination between railroad service and automobile bus service over the public highways, with respect to both passenger and express.

The application of Gust Chopp for a permit to operate an auto stage line between the same points was denied on the ground that this applicant had not complied with the laws of the state, due to his failure to pay the tax on the line which he has been operating between Pocatello, Idaho, and Logan.

Electric and Steam Roads Aligned in Massachusetts Case

There is a "key" case before the Massachusetts Department of Public Utilities, affording the commission an opportunity judicially to define to what extent buses may be permitted to compete with street railways and railroads.

This case is based on the petition of the Service Bus Line, Inc., for a certificate of public convenience and necessity to operate its bus lines from Orient Heights in Boston, through the Point of Pines and out to Revere Beach. This line started three years ago, under a license from the City Council of Boston, and its license was made self-perpetuating so that it could not be revoked except for cause. It did not have to come up for renewal, like other licenses. The new bus law says it shall be *prima facie* evidence of public convenience and necessity if a line had been running a year when the new law became operative. The Service Bus Line, Inc., it appears, qualified under this provision.

Now it is attacked by the Boston, Revere Beach & Lynn Railroad, which is a narrow gage railroad from Boston to Revere. The bus line and the railroad parallel each other. Karl Adams, president of the Boston, Revere Beach & Lynn, addressing the Public Utilities Department on the situation, declared that the Boston city government "slipped it over" on the railroads when it issued this license three years ago, because no public hearings were held and the railroad and street railways never had an opportunity to oppose the operation of the line. As the license was self-perpetuating there has been no opportunity since the original issue to oppose the line and as it was in operation a year before the new law the bus company has the *prima facie* evidence in its behalf. Moreover, Mr. Adams questions the legality of a corporation operating under a license issued to an individual, and he declares that in the case of the Service Bus Line, Inc., the original license was issued to an individual before there was a corporation. That point is to be investigated.

Fred A. Cummings, vice-president of the Eastern Massachusetts Street Railway, says that he subscribes to the statements of President Adams and adopts them as applicable to his own road. He says that the competition of the bus line is savage, unjust, unwarranted; that it is nothing but scalping.

The question before the Public Utilities Department is whether the license held by the Service Bus Line, Inc., should be made permanent. In view of the points at issue the court ruling may become the "key" for a basic decision.

Bus Permits Stir Ire of Holyoke Company

The Holyoke Street Railway, Holyoke, Mass., which has been in touch with the Boston & Maine Railroad relative to operating the electric line between Mount Tom Junction and Easthampton, Mass., has announced that the recent granting of bus permits to the railroad to operate buses between Mount Tom Junction and Easthampton practically puts an end to the other plan. The latter idea also included the operation of the Williamsburg and Northampton line electrically. It was reported some time ago that the hitch in the negotiations had grown to such proportions that the Boston & Maine was losing interest. It is probable the new method of transportation will also mean that the East Street trolley line between the junction and Easthampton will have to be abandoned. The line at present is said to be a losing proposition.

The matter is to be placed before the Selectmen of Easthampton to decide whether they wish the trolley or bus. The bus move is considered to mean that the railroad is planning to take steps eventually leading to the establishing of Northampton as its bus terminal. The Holyoke Chamber of Commerce desires the railroad to make Holyoke the terminal.

No Legislation on Interstate Buses

Both the Senate and House committees on interstate commerce have agreed to pigeonhole until the next session, and perhaps until the next Congress, the bill to bring interstate bus and truck traffic under the jurisdiction of the Interstate Commerce Commission.

The Senate committee concluded the time was not ripe for such legislation and that it should not be hastily passed. Extensive hearings were held on the bill and though it had the backing of state commissioners and the bus division of the American Automobile Association considerable opposition developed. Much of this opposition was predicated on the belief that the bill would stifle competition. Several suggestions were offered, but the committee has given little consideration to them.

Commission Over-rules City's Bus Ordinance

An attempt to interfere with the state regulation of public utilities by the city of Zion, Ill., when it issued an order on March 29 prohibiting buses of the Chicago, North Shore & Milwaukee Railroad from stopping for passengers within its corporate limits on Sundays, was recently over-ruled by the Illinois Commerce Commission. That body decided that the charter granted to the utility by the state denies the right of a municipality to pass ordinances or take other measures to alter features of service as set forth therein. In response to the protests of more than 400 inconvenienced Zionites, the North Shore line appealed to the commission on May 18 for authority to renew the Sunday service. It was then that the commission issued its over-ruling order. Accordingly, an attempt was made by

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the company to restore bus service on the original schedule. The driver of the first bus to stop within the city limits was arrested, however. Pending a promised action against the company by city officials, Sunday service in Zion has again been suspended.

Lines to Beaches Opened.—The New York State Railways, Rochester, N. Y., opened its bus lines on May 31 to Manitou and Grand View Beaches, cottagers' colonies on the shore of Lake Ontario near the city. The lines will remain in operation until the fall.

Competition Between Railway and Independent. — Competition with the Schenectady Railway, Schenectady, N. Y., is threatened by an ordinance passed by the Albany Common Council authorizing William G. Shultz to enter the city of Albany and to operate motor vehicles for hire over certain highways and streets for the purpose of carrying passengers and baggage between the city of Albany and the city of Schenectady. Mr. Shultz is restricted from carrying local passengers within the city of Albany.

Passage of Bus Ordinance Finally Recommended.—The city utilities committee of Seattle, Wash., has finally recommended the passage of an ordinance directing the Board of Public Works to call for bids on the purchase of fourteen new buses. The only string the committee tied to the recommendation is that the bodies be built in Seattle. An appropriation of $80,000 is available for the purchase of the buses, which will be used to augment present motor transportation lines operated by the city and to replace lines in the North End now privately operated.

Buses for Tourists' Season.—The Department of Street Railways, Detroit, Mich., through H. U. Wallace, general manager, has announced plans for extended bus service in the city during the coming tourists' season to run between the Michigan Central station and the business district. The schedule provides for coaches leaving the station and downtown every fifteen minutes between 9 a.m. and 4 p.m. and the fare will be 10 cents. The station street cars will continue to operate over their present routes. The service was requested by the Retail Merchants' Association, Detroit Hotel Association and Detroit Convention and Tourists' Bureau.

Richmond Bus Franchise Up for Consideration.—The streets committee of the City Council of Richmond, Va., is scheduled to meet June 16 to consider the proposed bus franchise. The bus situation has been considered from many angles. Phases of that unit of the transportation service cropped out during the prolonged consideration of the blanket traction franchise of the Virginia Electric & Power Company. Members of the committee believe that little time may be consumed in disposing of this auxiliary franchise. It will mean, they say, that the proponent parts will be discussed and that the public will be invited to appear before the committee at the proper time to enter protest or consent to the proposed routes. The Virginia Electric & Power Company will be represented at the meetings.

Financial and Corporate

Reorganization Plan Approved

Protective Committee of Fort Wayne, Van Wert & Lima Bondholders to Organize New Company

A plan of reorganization dated June 1 has been approved and adopted by the protective committee for the holders of first mortgage 5 per cent 25-year gold bonds of the Fort Wayne, Van Wert & Lima Traction Company, Fort Wayne, Ind. The bonds were due April 1, 1925.

Holders of such bonds not now deposited under the protective agreement may become parties to and participate in the benefits of the plan by depositing their bonds with all coupons due Jan. 1, 1920, and thereafter attached on or before June 23.

The property is covered by a mortgage dated April 1, 1905, of which $1,470,000 is now outstanding. All but $62,000 of said bonds are now deposited with the committee. The property has been in the possession of Henry C. Paul, receiver, since Feb. 1, 1921, appointed by the United States District Court for the District of Indiana and by the United States District Court for the Northern District of Ohio. As soon as in the judgment of the committee a sufficient number of bondholders have assented to this plan, the committee proposes to request the trustee to apply to the court for the entry of a decree foreclosing the mortgage and directing a sale of the property. The committee will bid for all or any part of the properties to be sold, whichever it deems advisable.

The committee proposes to organize a new corporation which will acquire all or such part as the committee may determine of the property which may have been purchased at the foreclosure sale, giving and paying therefore to the committee $441,000 of its general mortgage bonds and all its common stock. The new company will also assume all liability incurred by the committee and will reimburse the committee for all advances, expenses or disbursements. Capitalization of the new company will consist of $100,000 first mortgage bonds, $441,000 general mortgage bonds and 10,290 shares of common stock with or without par value. First mortgage bonds will be secured by a first mortgage upon all its properties including after-acquired property, will mature fifteen years from date thereof, will bear interest of 6 per cent and will be redeemable at such prices as approved by the committee and will contain other provisions including a sinking fund.

General mortgage bonds will be secured by a mortgage upon all properties, including after-acquired property, subject only to the $100,000 of bonds secured by the first mortgage. General mortgage bonds will mature thirty years from the date thereof, will bear interest of 5 per cent, payable semi-annually, and will be redeemable upon any interest date at $105.

Upon consummation of the plan and acquisition by the new company of the properties, and the issue by the new company of the stock and general mortgage bonds, the stock will be placed under a voting trust for a term of five years. The voting trust certificates and general mortgage bonds will be distributed by the committee to depositors as follows: Each holder of a certificate of deposit for $1,000 first mortgage bond of the present company will receive $300 of general mortgage bonds of the new company and voting trust certificates representative of seven shares of common stock of the new company.

Surplus of $11,241 in Quebec

After deducting operating expenses, bond interest and other fixed charges and depreciation a surplus of $11,240 was realized by the Quebec Railway, Light, Heat & Power Company, Quebec, Canada, for the year ended Dec. 31, 1925. This fact was disclosed in the sixteenth annual report of the company.

STATEMENT OF EARNINGS OF THE QUEBEC RAILWAY, LIGHT, HEAT & POWER COMPANY, LTD.

	1925	1924
Gross income from all sources	$3,243,123	$3,133,806
Operating expenses	2,194,987	2,156,492
Net operating income	$1,048,135	$977,314
Fixed charges	*816,895	712,642
	$231,240	$264,671
Depreciation reserve	220,000	250,000
Surplus (subject to deduction for income tax)	$11,240	$14,671

* This figure includes $44,664, percentage of city division earnings payable to the city of Quebec; $756,362, interest on bonds, and $15,867, interest general.

In his statement to the stockholders Julian C. Smith, president of the company, explains that during the year $518,000 of the company's 7 per cent general mortgage bonds were sold and the proceeds applied to the necessary construction and betterments. In accordance with plans prepared in 1923, additional extraordinary repairs and improvements to the property in general were made and further betterments to the system are contemplated. In addition, the building of new workshops is under consideration. As the present shops are small, old and inefficient, it is felt that by putting this project into execution economies and better operation will result. Mr. Smith said the directors were pleased to report the renewal of the street railway franchise for a period of 30 years. Substantial adjustments of the capitalization of the company, under consideration at the time of the last annual meeting, were made. The capital stock was reduced from $10,000,000 to $2,500,000 and the assets were correspondingly adjusted. The accompanying statement shows the results of operation in 1925 compared with 1924.

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Interstate Public Service Reports Improvement in 1925

The Interstate Public Service Company, Indianapolis, Ind., has acquired by purchase all of the competing bus lines operating in the territory served, which has placed it in exclusive control of the interurban and bus transportation facilities between Indianapolis and Louisville. Forty-one buses are in regular daily operation. This statement was contained in the annual report of the Interstate Public Service Company for the year ended Dec. 31, 1925. The balance carried to surplus was $310,723. In his statement to the stockholders Harry Reid, president of the company, stated that the annual report reflected most gratifying growth and improvement over the preceding year. The gross operating income exceeded that of 1924 by $2,116,415, and the net earnings indicated an increase of $853,072.

INCOME ACCOUNT OF THE INTERSTATE PUBLIC SERVICE COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Operating revenues		$8,916,453
Operating expenses (including retirement reserve, $248,466)		5,640,094
		$3,276,359
Uncollectible bills	$27,699	
Taxes	546,255	573,955
Operating income		$2,702,404
Rent for leased lines		171,296
Net operating income		$2,531,107
Non-operating income		38,502
Gross income		$2,569,609
Deductions from gross income:		
Interest on funded debt	$1,264,582	
Miscellaneous interest deductions	54,433	
Amortization of debt discount and expense	95,816	
Dividends paid on preferred stock of Indiana Power Company to date of purchase of property	36,933	1,451,765
Net income for the year		$1,117,844
SURPLUS ACCOUNT		
Surplus, Jan. 1, 1925		$803,544
Net income for the year, as above		1,117,844
		$1,921,388
Dividends paid and accrued:		
Prior lien stock	$584,935	
Preferred stock	222,185	
Common stock	385,416	1,192,537
		$728,850
Miscellaneous credits and debits (net)		61,711
Surplus, Dec. 31, 1925		$790,562

Mr. Reid refers to the increasing utilization of the parlor-buffet cars on the company's Indianapolis-Louisville interurban railway and states that the sleeping car service nightly in both directions between Indianapolis and Louisville has proved very popular and is being well supported by the public. This service is an important factor in creating through passenger revenue between the terminals that would not otherwise be secured. Several leading trunk line steam railroads have joined with the company in establishing a joint interline tariff which makes the company a participating carrier on interchange freight movements, receiving its proportionals on all published rates. This arrangement will materially increase the company's freight revenue.

In addition to other activities of the company, Mr. Reid refers to the employees' circulating library which has been created and maintained in the general offices for the availability of employees, also to the good public relations department, the women's committee and the safety work which has been continued, resulting in a low ratio of accidents. The accompanying statement shows the income account of the Interstate Public Service for the year ended Dec. 31, 1925.

Higher Fare in Richmond Benefits Property

For the year ended Dec. 31 1925, earnings from the transportation department of the Virginia Electric & Power Company, Richmond, Va., were $4,821,493. This compares with $4,749,044 for the previous year. It is the amount received from the 72,120,802 revenue passengers carried on the railways in Richmond, Norfolk, Portsmouth, Petersburg and on the interurban line between Richmond and Petersburg. Included in the amount are earnings from bus operation in Norfolk by this company and in Richmond by the Richmond Rapid Transit Company, acquired on Sept. 11. Miscellaneous revenue from advertising in cars and buses, and from other minor sources, is also included. Increased interurban fares and a change from 6 to a 7-cent railway fare in the city of Richmond have had a beneficial effect on the earnings of the transportation department. This was part of the explanatory statement made in the report of the directors of the company for the year 1925.

The report states that the acquisition of the Richmond Rapid Transit Corporation eliminated bus competition in Richmond. The operating deficit that was assumed when it was taken over was rapidly being reduced at that time, and the results of operation have since then been satisfactory. A unified street railway and bus transportation system operated exclusively by the Virginia Electric & Power Company became effective in Norfolk early in 1926.

ANNUAL REPORT OF THE VIRGINIA ELECTRIC & POWER COMPANY FOR 1925

	1925	1924
Total earnings	$12,143,975	$11,539,195
Expenses:		
Operation	$4,627,441	$4,477,522
Maintenance	1,402,467	1,430,367
Taxes	981,627	897,669
Total operating expenses and taxes	$7,011,536	$6,805,559
Net earnings:	$5,132,439	$4,733,636
Interest, amortization charge and lease rentals	1,512,202	1,427,307
	$3,620,237	$3,306,328
Dividends on preferred stock	718,878	581,543
Dividends on common stock	717,018	.....
	$2,184,340	$2,724,784
Special credit to surplus	2,798,191	.....
	$4,982,532	$2,724,784
Net direct charges to reserves and surplus	$129,688	$322,487
Retirement reserve	1,756,633	1,659,413
Sinking fund charges	322,184	304,080
Total deductions	$2,208,506	$2,285,980
	$2,774,025	$438,804
Deficit, Richmond Rapid Transit Corporation	87,517	.....
Balance to surplus	$2,686,508	$438,804
Ratio operating expenses to gross earnings, per cent	50.5	51.8

Financial Progress in Terre Haute Merger Awaited

Further steps in the proposed merger of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., and its subsidiaries with the Central Indiana Power Company, an Insull holding company, are expected shortly. On June 5 letters had been received from the holders of the 5 per cent cumulative preferred stock of the Terre Haute, Indianapolis & Eastern from a committee representing the stockholders suggesting that the stock be exchanged share for share for preferred stock of the merged company, which is to be known as the Indiana Electric Corporation. The basis of the merger agreement was entered into several months ago by Samuel Insull and the late Randall Morgan, who was one of the chief stockholders of the Terre Haute, Indianapolis & Eastern. Although no announcement was made, it is understood the merger plans were delayed by the death of Mr. Morgan shortly after the agreement was made.

The committee proposes to the holders of the 5 per cent cumulative preferred stock of the Terre Haute, Indianapolis & Eastern to exchange the stock par for par for shares of the Indiana Electric Corporation participating adjustment preferred stock of a par value of $100 a share.

The new stock is to receive from the company's surplus and net earnings non-cumulative preferred dividends for 1927 and 1928 of 2 per cent per annum; 1929 and 1930, 3 per cent per annum; 1931 and 1932, 4 per cent per annum; 1933 and 1934, 5 per cent per annum, and 1935 and thereafter, 6 per cent per annum. In addition it is proposed that this stock shall be entitled in 1925 and thereafter to an extra dividend of 1 per cent before more than a total of $600,600 shall be paid in total dividends to the common stock in any year.

Cincinnati Street Railway Will Purchase Milford Line

Purchase of the Cincinnati, Milford & Blanchester Traction Company by the Cincinnati Street Railway, Cincinnati, Ohio, has been approved by Edgar Dow Gilman, Director of Public Utilities, Cincinnati. The purchase price is approximately $49,000. Walter A. Draper, president of the Cincinnati Street Railway, said that operation of the line would undoubtedly begin within 30 days, that there would be improvement in equipment and service and operation of through cars from Mariemont to the heart of the city. The rate of fare will be fixed at 15 cents from Mariemont to the city.

While the Cincinnati, Milford & Blanchester Traction Company has made application to the Ohio State Public Utilities Commission to abandon that portion of the line from Milford to Blanchester, it is likely that the street railway will continue the operation of the system from Milford to Cincinnati, operating cars on a half hour schedule from Mariemont to Milford.

The Cincinnati, Milford & Blanches-

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ter Traction Company, which is a standard gage railroad, is owned by a Toledo syndicate, headed by L. G. Van Ness, president of the Cincinnati, Georgetown & Portsmouth Street Railroad. The sellers will retain the power plant and go into the business of supplying towns along the route with electricity.

Revenue Lower on San Francisco-Sacramento Line

The operating revenue of the San Francisco-Sacramento Railroad, San Francisco, Cal., for the year ended Dec. 31, 1925, was $975,388, a decrease of $15,162 over the preceding year. Operating expenses were $868,966, an increase of $25,314 over the preceding year. The company had $57,194 available as net income for the twelve months' operation with which to pay bond interest and other deductions. Of this net income the company paid $50,489 for bond interest and $6,521 in interest on unfunded debt and miscellaneous deductions, leaving $183 transferred to surplus. These figures were contained in the sixth annual report of the company to the stockholders.

Because of the increased automobile competition the passenger earnings of the railroad have been steadily declining, and as the company sees it, the railway must, if it is to increase its earnings, increase its freight revenue. Owing to the stringency of the terms of the present deed of trust, it has been impossible to finance the necessary freight feeders. To meet this condition the company arranged with the Western Pacific and the Sacramento Northern, the latter company a subsidiary of the Western Pacific, to have the Sacramento Northern build a branch line of some 13 miles into the Holland Land District. The value of the Western Pacific and Sacramento Northern contract lies in the fact that it provides for the building of a valuable freight feeder immediately and in the future possibilities accruing from the trackage agreement. The accompanying table shows earnings and expenses for the year ended Dec. 31, 1925.

COMPARATIVE STATEMENT OF EARNINGS OF THE SAN FRANCISCO-SACRAMENTO RAILROAD FOR YEAR 1925

Revenue from transportation:	
Passenger	$657,851
Baggage	550
Parlor and chair car	9,894
Special car	25
Mail	1,500
Express	21,962
Milk	1,666
Freight	264,214
Miscellaneous	269
Total	$957,935
Revenue from other railway operation:	
Station and car privileges	$4,611
Parcel room receipts	511
Storage	341
Demurrage	1,978
Rent of equipment	5,983
Rent of buildings and other property	3,087
Miscellaneous	938
Total	$17,451
Total railway operating revenue	$975,387
Operating expenses:	
Way and structures	$228,690
Equipment	98,979
Power	105,890
Conducting transportation	249,427
Traffic	52,823
General and miscellaneous	141,560
Transportation for investment credit	8,405
Total railway operating expenses	$868,966
Net operating revenue	$106,421
Taxes assigned to railway operation	$52,376
Operating income	$54,045
Non-operating income	$3,148
Gross income	$57,193
Deductions from gross income:	
Interest on funded debt	$50,489
Interest on unfunded debt	3,581
Miscellaneous debits	2,939
Total deductions from gross income	$57,010
Surplus	$183

Reorganization Proposed for Illinois Interurban

Holders of the first mortgage 5 per cent gold bonds of the Rockford, Beloit & Janesville Railroad, Rockford, Ill., were notified recently that under a projected plan of reorganization they will be enabled to exchange their bonds for preferred stock of the company, which will be issued as soon as necessary legal steps are taken to foreclose the mortgage securing the bonds. The foreclosure proceeding follows an announcement that the receiver of the Rockford & Interurban Railway had agreed to surrender the property of the Rockford, Beloit & Janesville, which was a subsidiary of the former line, on the ground that it is now being operated at a loss and will endanger the security of bondholders of the Rockford & Interurban, if continued in operation by the receiver. A committee has arranged that the bondholders may exchange their bonds at a rate of three shares of new cumulative preferred stock, par value $50, and one share of no par common stock out of a total issue of 7,000 shares of such stock for each $1,000 in principal amount of bonds surrendered.

It has since been announced that T. Milton Ellis, president of the Beloit Traction Company, Beloit, Wis., has arranged to take over the Rockford, Beloit & Janesville Railroad and operate the line for the bondholders until given legal title to the line by the court.

Cessation of Service Sanctioned.—Discontinuance of trolley service by the Burlington County Traction Company between Burlington and Moorestown, N. J., was approved on May 27 by the New Jersey Board of Public Utility Commissioners. In another decision the board sanctioned the transfer to the Public Service Transportation Company of permits held by the Burlington County Transit Company for the operation of buses over the same route.

Surplus for Ten Months.—For the ten months ended April 30, 1926, the total revenue of the Interborough Rapid Transit Company, New York, N. Y., from all sources was $51,405,431, an increase of $2,451,949 over the corresponding period of last year. This increase is partly accounted for by the receipt in July, 1925, of a cash payment of $770,000 as part consideration for the new advertising contract, which became effective on Nov. 1, 1925. There was no similar payment in the previous year. Operating expenses, taxes and rentals paid to the city for the old subway increased $187,496. Income deductions increased $381,137. The net result for the ten months was a surplus of $1,849,467. This represents an improvement of $1,883,315, compared with the corresponding period of 1925, due largely to the new advertising contract.

Recommends That Claims Be Allowed.—Unsecured claims against the United Railways, St. Louis, Mo., reported to United States District Judge Faris by Special Master Fred L. Williams amount to $448,000. He recommended to the court that these claims be allowed. Most are damage suit judgments obtained prior to the receivership. Approximately $400,000 of the claims have been assigned to Stanley Clarke, attorney for the reorganization committee, having been settled by the committee.

$11,299 Available for Surplus.—The Santa Barbara & Suburban Railway, operating in Santa Barbara, reports to the California Railroad Commission its 1925 operating revenue at $123,531, compared with $137,053 for 1924. The operating expenses, excluding taxes, for 1925 are reported at $102,989 and at $103,755 for 1924, leaving net operating revenue of $20,542 for 1925 and $33,298 for 1924. During 1925 taxes charged to operation amounted to $9,242 and for 1924 to $10,769. Deducting the taxes leaves operating income of $11,299 for 1925 and $22,528 for 1924.

Bonds Not Paid.—The $300,000 of first mortgage 5 per cent bonds of the Shawnee-Tecumseh Traction Company, Shawnee, Okla., due June 1, were not paid off on that date nor has any provision been made for their extension. These bonds are all owned by the small syndicate which built the road and still owns the stock. It is said there is no likelihood of foreclosure proceedings being instituted.

Directors Favor Burlington Purchase.—An offer has been received for the purchase of the Burlington Traction Company, Burlington, Vt., and is favored by the directors. The traction company owns the trolley system in Burlington and the Military Post Street Railway, which operates lines between Burlington and Essex Junction via Winooski. The name of the purchasing company is at present withheld. Letters to stockholders state the directors have voted to purchase the stock of the Burlington Traction Company at par. The purchaser will pay in cash or 7 per cent stock of the new company, or part cash and part stock, as each stockholder may choose.

Line in Connecticut May Discontinue.—Court action which may result in the abandoning of railway operation by the Hartford & Springfield Street Railway between those cities was set for June 11. On that day Judge Isaac Wolfe was to hear the application of the company for permission to end service after June 25. The road was sold April 27 under a foreclosure of its bonded mortgage for $860,000, but Francis R. Cooley, who bid in the road as an individual bidder, did not take possession.

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Book Reviews

Report of the Third Annual Convention of the Internationaler Strassenbahn- und Kleinbahnverein

Published by the association. 332 pages.

This is a report of the meeting held in Budapest June 21-25, 1925. In addition to the proceedings, there are several articles on electric railway developments in Budapest, a list of the attendants at the convention and a list of the members of the association. A table of the membership shows there are now 324 railway members and 101 manufacturer members, making a total of 425. This is an increase of 35 over the previous year. Abstracts of a number of papers presented at this meeting were published in the ELECTRIC RAILWAY JOURNAL during the latter part of last year.

Railway Engineering and Maintenance Cyclopedia

Simmons-Boardman Publishing Company, New York. 1,072 pages. 2,500 illustrations. Price, leather, $10; cloth, $8.

This is one of the comprehensive railroad encyclopedias issued by the publishers, companion books being the Car Builders' Cyclopedia and the Locomotive Cyclopedia. The volume just issued is a second edition of the Maintenance of Way Cyclopedia, which was published in 1921, but it has been changed in name to indicate its scope more accurately. It now includes a definitions section of 71 pages, a track section of 278 pages, a bridge section of 141 pages, a building section of 141 pages, a water service section of 84 pages, a signal section of 187 pages and a general section of 82 pages. The information in these sections has been compiled and edited in co-operation with the American Railway Engineering Association and the signal section of the American Railway Association.

The volume is an important contribution to the literature of railroad engineering and represents an amount of painstaking work which can hardly be realized by any one who has not engaged in a somewhat similar undertaking. The typographical appearance of the book is also good, the sizes of the type and illustrations being well chosen. Elmer T. Howson, Western editor of *Railway Age* and editor of *Railway Engineering and Maintenance*, had general charge of the publication of this cyclopedia.

Handbook of Automotive Standards

Issued by the Society of Automotive Engineers, 29 West 39th Street, New York, N. Y. 600 pages. Price $2.50 to members; $5 to non-members.

For the first time, all of the standards of this huge industry have been published in a bound handbook, of pocket size, 7½x4½ in. and only ¾ in. thick. The book contains all of the 500 odd standards and recommended practices approved by the society and revised to date. These include many drawings, tables, charts and forms and much elucidating text.

The contents are divided into sections relating to power plant, lighting, electrical equipment, parts and fittings, iron and steel, non-ferrous metals, nonmetallic minerals, transmission, axles and wheels, tires and rims, frames and springs, controls, bodies, tests, nomenclature, general, and standards committee regulations.

Hereafter revised editions are to be issued semi-annually, as the society approves new or revised standards and recommended practices only twice a year.

Pegasus or Problems of Transportation

By Col. J. F. C. Fuller. E. P. Dutton & Company, New York, N. Y. 1926. 88 pages. $1.

A story of future movement is told by a British war veteran, Col. J. F. C. Fuller, in "Pegasus or Problems of Transportation." His accounts of the "Battle of the Iron Horse," fought by George Stephenson, the father of the locomotive, and his suggestions for "The Conquest of the Elysian Fields" are so sympathetic and realistic that a reader is easily won over to the doctrine of the caterpillar or semi-caterpillar type of vehicle as a practical solution for many present transportation problems.

The accomplishment of the tank in France in the World War inspired Mr. Fuller with its potentialities in England in a time of peace, confronted with the difficulties of surplus population and unemployment. He sees three solutions to the problem—"we must stop breeding, we must create new home industries and so absorb our surplus population, or we must transport the surplus to less thickly populated areas overseas." Birth control he summarily dismisses, for the government does not believe in it. The second solution joins the first because of the existing subsidy for the coal mining industry and the subsequent lack of protection for new industries. As regards the third, he believes very little has been done outside of private effort. He says the problem has been tackled from the wrong end. Instead of persistent efforts to shift the unemployed, attempts should be made to shift the men already employed.

It is his belief that the empty spaces of the world will be settled only as transportation is quickened. The steamship and the railway must be used first and then the motor vehicle. He sees the roadless vehicle as most useful because it can go anywhere and take the man to his work and his products to market in less time than the motor truck rolling along a prescribed area.

The technicalities of the roadless vehicle are not discussed, but he mentions two main types: An all-tracked machine of the tank type and a half-tracked machine which has wheels in front and tracks in the rear. In the manufacture of these vehicles three main problems must be solved—the vehicle must be able to use roads without damaging them and it must not damage the surface of the ground over which it travels, it must be able to move across country without damaging itself, and the cost per ton-mile must be equal or lower than that of existing vehicles.

Although Colonel Fuller believes that the roadless vehicle can replace the motor car, he states it cannot replace the railway if the railway is an efficient one. But the problem, according to him, is, first, to bridge the gap between the producer and the railway, and, second, to create in undeveloped countries sufficient wealth to enable more railways to be built. Co-operation with existing railways must be the aim.

He compares his dream of the great future of the roadless vehicle to the prediction of Mr. Balfour, who on May 17, 1900, in the House of Commons said: "In addition to railways and tramways we might see great highways constructed for rapid motor traffic." But as Stephenson won the battle for the Iron Horse by imagination, perseverance and an indifference to the jibes of the ordinary mortals, so will the transport difficulties of today be solved when Pegasus with wings "conjures up images of things to be."

Safety Rules for the Installation and Maintenance of Electric Utilization Equipment

Prepared by the Bureau of Standards. Government Printing Office, Washington, D. C. 72 pages. 15 cents.

Handbooks Nos. 6 and 7 of the Bureau of Standards, safety rules for the installation and maintenance of electric supply stations and for electric utilization equipment are printed in small handbooks containing a single part of the code by the Department of Commerce, Bureau of Standards, George K. Burgess, director.

In response to a demand that the fourth edition of the National Electrical Safety Code be issued in separate publications dealing with the several subjects covered, the Department of Commerce, Bureau of Standards, has issued Nos. 6 and 7. No. 6 gives the safety rules for the installation and maintenance of electric supply stations and contains sections No. 9 to 18 inclusive of the National Electrical Safety Code. Handbook No. 7 gives the safety rules for the installation and maintenance of electric utilization equipment and contains sections 9 and 30 to 39 inclusive of the safety code.

The first editions of these rules is the result of a revision which was carried out according to the procedure of the American Engineering Standards Committee and the revised rules have had the approval of the sectional committee organized according to those rules of procedure. Two sizes of type have been used in the text of the handbook, the larger contains the rules proper, whereas the explanatory notes, etc., are in smaller type.

The Electrician—Annual Tables of Electricity Undertakings

Benn Brothers, Ltd., 8, Bouverie Street, London, E.C. 4. Price, 10/9.

This is the 39th edition of the Annual Tables of Electricity Undertakings, published annually since 1888. The tables have been thoroughly revised and further useful details have been added. Particulars of many additional undertakings in Great Britain, Europe and the colonies and countries overseas have been included, the total number now dealt with being more than 2,000.

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Personal Items

W. R. Robertson New Canadian President

W. R. Robertson, since 1920 general superintendent of railways Hydro-Electric Power Commission of Ontario, was elected president of the Canadian Electric Railway Association at its 22d annual convention held in Quebec on June 2-4. Many years of experience in electric railroading have made Mr. Robertson an expert with statistics. Ask him any question pertaining to the subject and he will reach into his brief case and bring out the most convincing figures. This has become such a habit with him that a taxicab is needed to carry his well-filled cases.

Mr. Robertson became identified with the utility business at the age of twelve, when he started work for the Bell Telephone Company. After holding various positions in the steam railroad field, in the latter part of 1897 he accepted a position with the Port Dalhousie, St. Catharines & Thorold Railway, one of the first electric lines in Canada. The next year he left to enter the foundry business. The transportation urge was too strong, and in 1899 he went with the Niagara Central Railway just prior to its electrification. Promotion followed, and he advanced through the grades of inspector, assistant superintendent and transportation manager until he was made superintendent in 1903.

W. R. Robertson

Meanwhile the company was expanding, and in 1909 Mr. Robertson was made general superintendent, the name having been changed to Niagara, St. Catharines & Toronto Railway & Navigation Company. He remained in that position until the road was taken over by the government as part of the Canadian National Railways. At present he is general superintendent of the entire system of Hydro-Electric Railways, which operates transportation services in Peterboro, Guelph and Windsor, and also the Toronto and York "radials," or interurbans, the whole comprising more than 200 miles. Mr. Robertson was born in Hamilton, Ont., on June 28, 1875.

Changes in Milwaukee Bus Personnel

Alvin McEvoy, who has been connected with the Wisconsin Motor Bus Lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., since their inception, has been promoted from supervisor of personnel to assistant superintendent of operation.

Andrew H. Johnson, who has been chief clerk for four years of the Wisconsin Motor Bus Lines, Kinnickinnic station, and prior to which he was associated with the electric railway division since 1913, has been promoted to inspector of service in the bus traffic department.

Norman Mangert, city line supervisor, has been selected to fill Mr. Johnston's post.

Eugene S. Gregg, for five years chief of the transportation division of the Department of Commerce, resigned recently to accept a position in the executive offices of the Western Electric Company, 195 Broadway, New York City. After graduation from Austin College and the University of Chicago, Mr. Gregg had extensive experience in transportation work as first lieutenant and captain, in the shipping section of the General Staff, U. S. A., War Industries Board, Shipping Board and later as chief of the shipping section of the American International Corporation. Mr. Gregg was appointed from Texas to the service of the Department of Commerce in August, 1921, as chief of the transportation division.

J. A. Federhen has recently become associated with the Fort Smith Light & Traction Company, Fort Smith, Ark., as assistant to Robert C. Coffy, in charge of public relation. Mr. Federhen is an example of an outsider who has made a success in other lines of endeavor and hopes to find in the public utility industry the opportunity to do bigger things. In June, 1913, he became associated with the Springfield Post Office, serving in all departments, including the civil service bureau. He was promoted to superintendent of mails in the Fort Smith, Ark., post office in August, 1922. The desire to enter a broader field led him into public utility work. Mr. Federhen was born in Milwaukee, Wis., and moved to Springfield, Ill., at an early age.

E. L. Fariss, general stores keeper for the Georgia Railway & Power Company, Atlanta, Ga., has resigned to join his brother in operating a Ford agency at Tampa, Fla. Mr. Fariss joined the Georgia Railway & Power Company in 1908 as a meter reader. Shortly afterward he was transferred to the stores department, and in 1925 he was made general stores keeper for the company.

H. E. Borton Heads Southwestern Public Service Association

As a tribute to his untiring efforts in promoting Southern enterprise and in recognition of his accomplishments in that section of the country Harold E. Borton was elected president of the Southwestern Public Service Association at the recent convention in Galveston, Tex.

Mr. Borton has had a long and varied experience with public utilities. His early history is interwoven with the activities of the Fred A. Jones Construction Company, engaged in building the Texas Traction Company and the Southern Traction Company, operating lines to Denison and Waco. These two roads are now included as part of the extensive interurban system of the Texas Electric Railway. This was one of the great developments in the utility field in the South, the company now owning 272 miles of line. Mr. Borton later turned his attention to the Corsicana Gas & Electric Company, which he served as operating superintendent from 1911 to 1916. This served to round out his other engineering and management experience. Relinquishing his affiliations with this company, he assumed the general managership of the Calvert Water, Ice & Electric Light Company, and remained in this capacity for seven years. Then it was that he became associated with the Texas Power & Light Company and affiliated companies, among which he holds the office of vice-president of the Mineral Wells Electric Company.

H. E. Borton

Mr. Borton has a great capacity for work, for although he was at times practically overwhelmed with the immediate duties of the offices of the company with which he was identified he always kept up his association activity, giving more than his passive presence at the meetings. During two different terms he served as vice-president and chairman of the electric section.

Other officers of the Southwestern Public Service Association elected at the meeting in Galveston are E. H. Kifer, first vice-president and chairman of the electric section; W. H. Burke, second vice-president and chairman of the railway section, and C. K. Fletcher, third vice-president and chairman of the gas section.

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Obituary

J. D. Spreckels

A railway magnate, sugar promoter, shipping owner, banker, capitalist and philanthropist died in Coronado on June 9. This man was John Diedrich Spreckels, a romantic figure of the West and a practical idealist of the twentieth century. His death marks another milestone in the tradition of the famous Spreckels family, all of whom were imbued with a spirit of adventure and pioneering and in the history of San Diego, which has become of late years synonymous with the name of Spreckels. At the time of his death Mr. Spreckels was president of the San Diego Electric Railway and the San Diego & Arizona Railway.

One of his early connections with the street railway business was the purchase, with his brother, Adolph B. Spreckels, who died a few years ago, of the San Francisco & San Mateo Electric Railway, which after reconstruction was sold to Eastern capitalists who acquired other lines in the city, and all were finally consolidated into the United Railroads of San Francisco. He first visited San Diego in 1887. To this accidental acquaintance with that city can be traced not only the development of one of the most progressive electric railway systems in the country but also the success of many large industrial enterprises. He and his brother bought the horse car line in 1890. They reconstructed and electrified it and began operation with twelve 24-passenger cars. Today the system operates 105 miles of line and owns 178 motor passenger cars. Not in terms of equipment or mileage is its good will measured, but rather in its never-ending campaign to satisfy its customers. In this phase of the work he was fortunate in having at the helm a son, Claus Spreckels, a man with a capacity for clear thinking and a willingness to do right by his superiors and subordinates, and with him as general manager of the property is shared the laurels for the successful management of this system. What Claus Speckels and Ed Burns, his assistant for a time, accomplished through human relations activities in San Diego is a matter of record.

Limning John D.'s railway career alone presents an unfinished picture. A son of a "sugar king," he too found a place for himself in the sugar trade, which had made his father, the late Claus Spreckels, a prominent figure on the West coast and on the Hawaiian Islands. He needed ships to advance his interests, so with characteristic temerity and tenacity he launched a commercial fleet which later was to plow its way to the Fiji Islands and Australia. His shipping interests grew into the present Oceanic Steamship Company.

In the midst of his busy career he found time to devote himself to many philanthropic projects and public service requirements.

John D. Spreckels was not a product of California soil. He was born in Charleston, S. C., 72 years ago. When a very young boy his parents moved to California. He was educated at the Polytechnic School at Hanover, Germany, and at Oakland College, Cal.

A. C. Baker, who retired recently as director in chief of the Sesqui-Centennial Exposition of Philadelphia, died on June 5. Upon mentioning his retirement in the ELECTRIC RAILWAY JOURNAL of May 29, page 951, it was stated that E. L. Austin, business manager and comptroller, would succeed Mr. Baker.

Samuel H. Dannatt, manager of the New York office of the Electric Service Supplies Company, died May 30 at his home in Mount Vernon, N. Y. Mr. Dannatt was associated with this company for five years. Prior to his connection with the Electric Service Supplies Company he was associated with the Westinghouse Electric & Manufacturing Company, the Electric Power Equipment Corporation and the Una Welding & Bonding Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Graham Brothers' Sales Gain

Total factory shipments of Graham Brothers' trucks and motor coaches from Jan. 1 to May 15, 1926, amounted to 13,022, a gain of 5,027, or 63 per cent over the corresponding period one year ago.

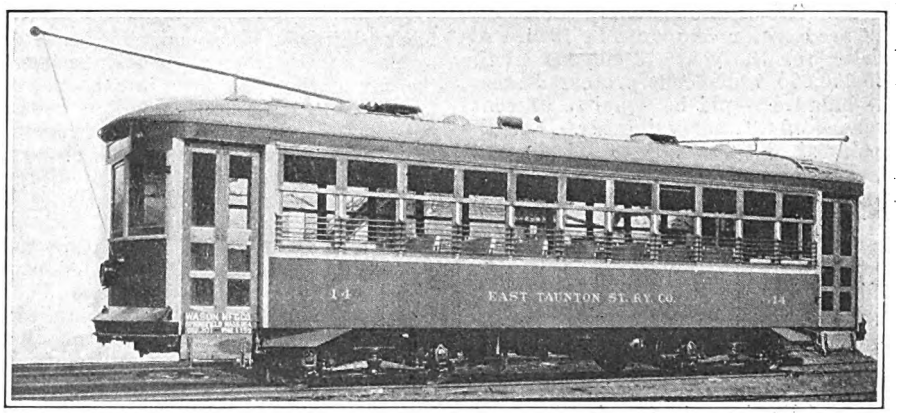
Shipments of Graham Brothers' trucks and motor coaches in several days less than four months of 1926 exceeded the entire factory production of 10,728 units shipped in the twelve months of 1924.

In 1922 factory sales showed a gain of 181 per cent over the previous year, while in 1923 the gain was 105 per cent over 1922. Sales for 1925 showed a gain of 123 per cent over 1924.

Gas-Electric Rail Cars

Delivery of two combination passenger and baggage gas-electric rail cars, one combination mail and baggage trailer, and one passenger and baggage trailer has been made to the Central Vermont Railroad by the J. G. Brill Company, Philadelphia, Pa. One combination passenger and baggage gas-

East Taunton Gets New Cars



Delivery has just been made to the East Taunton Street Railway, Taunton, Mass., of two double-truck light-weight one-man two-man cars by the Wason Manufacturing Company, Springfield, Mass. The seating capacity of these cars, which have an over-all length of 36 ft. 10 in., is 44. They are of semi-steel construction. Principal specifications follow:

Weight:	
Car body	12,934 lb.
Trucks	9,400 lb.
Equipment	5,600 lb.
Total	27,934 lb.
Bolster centers, length	17 ft. 8 in.
Length over all	36 ft. 10 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 1 in.
Height, rail to trolley base	10 ft. 11⅛ in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	Agasote ¼ in.
Roof	Arch
Air brakes	General Electric
Armature bearings	Plain
Axles	4 in. diameter, 4½ in. gear seat
Bumpers	Channels, 6 in.
Car signal system	Faraday buzzer
Car trimmings	Statuary bronze
Center and side bearings	Brill
Compressors	CP-27B
Conduits and junction boxes	Standard
Control	K-35-JJ
Couplers	Bar
Curtain fixtures	Pinch handle
Curtain material	Fabrikoid double faced
Destination signs	Hunter illuminated
Door operating mechanism	Manual
Fenders	Lifeguards
Finish	Enamel
Gears and pinions	G. E. solid
Hand brakes	Peacock type G-14.34
Heater equipment	Gold 405-E. B.
Headlights	Golden Glow
Journal bearings	Friction
Journal boxes	Brill
Lightning arresters	G. E. MD.
Motors	Four G. E. 25-hp., inside hung
Sanders	Ohio Brass
Sash fixtures	J. L. Howard rack
Seats	Brill "Waylo"
Seating material	Rattan, spring upholstered
Springs	Brill
Step treads	Mason safety
Trolley catchers	Wilson type "T"
Trolley base	U. S. automatic
Trolley wheels	G. E.
Trucks	Brill 177-EX
Ventilators	Eight Brill exhaust type
Wheels	26 in. diameter

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electric car is also being built for the East Broad Top Railroad & Coal Company.

Armco Culvert Industry Celebrates Anniversary

This year the thirtieth anniversary of the invention of the corrugated culvert is being celebrated by the Armco Culvert & Flume Manufacturers' Association, Middletown, Ohio. A feature of the celebration is the display in the association's research laboratory at Middletown of the first corrugated culvert ever made. This culvert was manufactured by the inventor, James H. Watson, and placed early in 1896 under a public highway near Crawfordsville, Ind., from which location it was recently removed for exhibition purposes. It is one of many similar culverts still in service near Crawfordsville.

Thirty years ago James H. Watson and his immediate successor, W. Q. O'Neall, conducted a small hand-operated factory at Crawfordsville and succeeded in getting a number of culverts placed, with many misgivings, under nearby roads. Today the Armco culvert industry operates more than 30 thoroughly modern and efficient plants.

Yellow Truck Earnings

Yellow Truck & Coach Manufacturing Company, Chicago, Ill., reports a net income of $2,330,743 in 1925, after depreciation, taxes and other charges. This compares with $2,742,408 for the Yellow Cab Manufacturing Company, the predecessor company, in 1924. Allowing for the year's dividends on the $15,000,000 7 per cent preferred stock, the balance would be equal to 91 cents a share of $10 par value earned on the combined 600,000 shares of class B stock, and 800,000 shares of common stock, comparing with $1.20 a share on the same basis in 1924.

World's Largest Office Building to Take Graybar Name

Announcement was made recently by Frank A. Ketcham, executive vice-president of the Graybar Electric Company, following signing by his company of a contract leasing the entire fifteenth floor of the proposed largest office building in the world, that the new structure will be known as the Graybar Building, taking its name from the Graybar Electric Company. The new building will be located adjacent to the Grand Central Terminal, facing Lexington Avenue and situated between 43d and 44th Streets. The building will occupy more than 1½ acres of ground and will be ready for occupancy May 1, 1927.

The Graybar Electric Company was incorporated Jan. 1 of this year as the successor to the supply department of the Western Electric Company.

Metal, Coal and Material Prices

Metals—New York	June 8, 1926
Copper, electrolytic, cents per lb	13.90
Copper wire, cents per lb	16.00
Lead, cents per lb	7.675
Zinc, cents per lb	7.40
Tin, Straits, cents per lb	58.75
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.50
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.675
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.20
White lead in oil (100-lb. keg), N. Y., cents per lb	15.00
Turpentine (bbl. lots), N. Y., per gal	$0.88

Rolling Stock

Northern Ohio Traction & Light Company, Akron, Ohio, has just ordered a Differential car wheel truck and tractor from the Differential Steel Car Company, to be fitted to its Thew electric shovel.

Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont., plans to turn out soon twelve new one-man cars made in their entirety in the St. Catharines shops of the Canadian National Railways. The cars are bright yellow in color, of steel construction and are in every way complete as to modern running gear and safety devices. The cars weigh 29,000 lb. and seat 44 passengers. They will be used on the city and local lines in St. Catharines and Niagara Falls.

Utah Light & Traction Company, Salt Lake City, Utah, is making a number of improvements in its one-man street cars. Installation of automatic rear exits will constitute one of the principal changes. A treadle on the back platform, which may be operated by passengers when they wish to leave the car at the rear door, is expected to facilitate loading and unloading in the rush hours. Larger carrying capacity will be provided in the remodeled cars by removing the side seats from the front to the back, thereby making a larger and more comfortable bench at the rear of the car. Better lighting and ventilating facilities have been provided and arrangements have been made to keep the cars more sanitary by improved sweeping and mopping conditions. New fenders and lifeguards have been added to the cars. The lifeguard is operated automatically and the least touch on the fender in front will cause the scoop under the car to drop. Two of the new type are completed.

Track and Line

Los Angeles Railway, Los Angeles, Cal., has started the extension of the Eighth Street line to Western Avenue.

Springfield Street Railway, Springfield, Mass., will start construction early in July on the relaying of trolley rails and paving the roadway on Main Street between Vernon Street and Sharon Street. The company will also lay a concrete base under both tracks on Fort Pleasant Avenue.

Pacific Northwest Traction Company, Everett, Wash., will receive bids until June 21 for the construction of a steel or wood overhead crossing 100 ft. long spanning the North Trunk Highway 5 miles north of Seattle. Bids will be received at the office in Everett.

Power Houses, Shops and Buildings

Nashville Railway & Light Company, Nashville, Tenn., has completed the new $45,000 railway substation on Wedgewood Avenue near the Tennessee Central Railway crossing. As the new station was completed, a 500-volt synchronous condenser was also placed in operation.

Mobile Light & Railroad Company, Mobile, Ala., will occupy its new $40,000 brick office building at its yards on Springhill Avenue by Sept. 1. The structure will be two stories high; all the second floor and part of the first will house the business offices. On the first floor will be shops for minor repair work. A. H. Downey is the architect of the structure.

Trade Notes

Robert June Engineering Management Organization, Detroit, Mich., has moved to larger quarters at 2208 West Graham Boulevard, where it now occupies the entire building. This is the organization's fourth move in four years to larger quarters. The new building will provide greater facilities for giving service to clients.

Industrial-Utilities Service Bureau, Louisville, Ky., A. R. McLean, principal, announces that to keep pace with Louisville, and the bureau's constantly increasing business, it has been found necessary to formulate a program of expansion. The first move in this direction will be larger quarters at Suite 303 and 304 the Lincoln Bank & Trust Company, Louisville. The bureau specializes in the handling of matters connected with personnel.

Johnson Fare Box Company, Chicago, Ill., announces that its New York offices and service station have been moved to 2 West 61st Street, near Columbus Circle. The new telephone number is Columbus 8859.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued a booklet, "Traffic Signal Systems." It is designated as bulletin No. 217 and deals not only with the traffic signals but with the necessary control apparatus which accompanies them. Signals for overhead suspension or for street mounting and of various colored light systems are listings.

Westinghouse Electric & Manufacturing Company has released special publication 1643-A describing the application of oil circuit breakers. It describes fully the general application of oil circuit breakers, the determination of short-circuit current and the precautions necessary, and devotes a number of pages to tables and charts. Several interesting halftone illustrations are also included. This publication may be obtained from any of the district offices of the Westinghouse company or from the department of publicity at East Pittsburgh, Pa.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

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Squeaks and Rattles Tell Their Own Story

ONE good thing there is about noise and only one—it tells when something is wrong. A car pounding its way over track or special work indicates that there is something wrong with the track and that it should be fixed. A noisy gear or rattling truck part says that destructive wear is taking place and that the car should go to the shop.

Every moving part on the car is a potential source of noise. The possibilities are that any one car will have many noise-producing elements. Consequently the only way to overcome the tendency to wear excessively and so increase the noise that will be produced is to maintain close fits, have the machine work accurate and the parts tight.

It was a wise Providence that so regulated our sensibilities that noise gets on our nerves. Were it not true it is quite possible we would blindly let the uneconomic wear go on until actual destruction occurred. But as it is, not nearly enough attention is paid to the warning that is given by the squeaks and rattles that develop in time even in the best of equipment.

Arrangement of Material in Storeroom Has Bearing on Its Efficiency

SOME remote corner of the car repair shops, too dark for satisfactory maintenance work, often is considered by the railway management as a good enough location for the storeroom. Row after row of wooden bins extending from floor to ceiling prevent the little light that enters from penetrating far. An atmosphere of gloom pervades the whole place.

The harmful effects of this practice are twofold. No one can do his best work among such surroundings. The morale of the storekeeper and his assistants suffers on account of the dismal appearance of their workshop. Worse than that, however, is the loss of time spent in searching for material tucked away somewhere at the back of a dark bin.

Good storekeeping requires that the quantities of materials and supplies on hand be known at all times. While this is largely a matter of keeping accurate records, it is also necessary to make more or less frequent physical inventories. Dark or inaccessible storage bins greatly hamper this process.

Wire screening in place of solid boards not only makes it easier to see the material in storage but also permits better penetration of light and air. White paint will do much to brighten up the average storeroom. The unit-piling system facilitates the making of inventories. Railways which have modernized their storerooms along these lines have found that the improvement is worth all it costs.

Executives' Conference Attendance Raises Some Questions

THIS is no time to mince words in the local transportation industry. Fundamental changes are taking place. The industry is in the midst of one of those periods of deep-seated readjustment which come to all businesses at one time or another. A strong current of changed conditions has set in. Those who recognize the trends and set their course accordingly will ride on to widened opportunity and greater accomplishment. But those who neglect to recognize the current of progress will be swept into the eddies of stagnation and their places will be taken by new and keener men.

In the discussion at the second Advisory Council conference held in New York on June 10 and 11, which is abstracted elsewhere in this issue, there was evidence of the rise of a broader and stronger current in the industry. Words were not minced. It was far from a mutual admiration session. Men high in financial and utility circles spoke plainly but constructively—and hopefully. There were few platitudes. There was little beating about the bush.

The primary purpose of these meetings has been to afford an opportunity for the frank discussion of current railway problems and an interchange of ideas on how to meet them. Men who control the destiny of many properties gave liberally of their time and thought for the good of the industry. They came both to talk and to listen to the managers' difficulties. An owner-manager conference—surely that is desirable. But of the executives who indicated their acceptance of the invitation to attend this latest meeting, considerably fewer than half attended.

One seeks in vain for an explanation of this lack of interest. Surely the industry has plenty of problems ahead. Why, then, the apathy toward such a meeting? Is there nothing to be learned from one's neighboring property? Have the absent managers no ideas which they wish to check or exchange with others in a similar situation? The present condition of the electric railway industry calls for vision, broadened thinking and determination to find ways of effecting improvements. Are some managements too well-satisfied with their own opinions? Or do they lack initiative or energy or confidence in their own business? Are they inclined to drift? Are they overlooking their responsibility for finding ways and means to bring about improvement

This is the issue in June that is devoted essentially to maintenance subjects

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and to put their properties on a paying basis? Have they become so saturated in detail and precedent as to lose necessary perspective and vision?

In the answers to these questions there may be explanations for some of the industry's difficulties.

What Kind of Courage?

COURAGE, and whether the industry has it, seemed to arouse a bit of healthy discussion at the recent Advisory Council meeting in New York. Several speakers said we need courage to proceed. Others remarked that the exposition of courage in the past was an outstanding factor in the romantic history of the industry.

Both contentions are well founded. It takes courage to stick in the front line trench when the fire of battle rages around you. It takes courage to stick at a job when everything goes dead wrong. But another kind of courage is necessary on the part of the officer in charge when he decides that the tactics must be changed from defensive to offensive. When the executive of an industry finds that his product is not holding its own in popularity, it takes courage to look it over critically to determine what is wrong and then to strike at the heart of the trouble.

One is the courage to perform at all odds; the other to create. One, the task of the operator; the other, of the executive. Electric railway history of the past is replete with the former, but what we need today and are beginning to see is the courage to create anew.

Bringing Work to the Machine or the Machine to the Work

REPAIRS to electric rolling stock present a difficult problem. The time available for making them is limited, as most railways need all cars possible for service during the morning and evening peak periods. This makes it hard to keep down the number of non-productive hours in the railway shop. Maintenance men realize that makeshift repairs are only a waste of time and that careful work is needed to keep rolling stock in revenue service for long periods and to prevent annoying delays on the road which disrupt schedules. These men would like to have the best machine tools provided for doing the work and plenty of time to do the jobs well.

Portable machines are being used in electric railway shops to a limited extent and for some classes of repair work they are proving satisfactory and economical. There seems to be quite a widespread feeling among master mechanics and shop superintendents, however, that better work will result if it is done on a stationary machine.

The advantage of portable machines is that repairs to equipment can frequently be made without dismantling it completely and no time is lost in carrying the parts to and from the machine shop or wood mill. As regards the actual repair work, it can be done quicker and probably better if the part is removed and taken to a machine.

The most satisfactory results will be obtained by laying out a definite repair schedule for work that is sure to be repeated regularly. Sufficient spare parts will insure that the schedule is maintained and that the needed time for repairs is available. By providing material-handling equipment and labor-saving devices a balanced production will be assured and best use can be made of the existing machine tools. To take care of emergency repairs, crippled cars, etc., which cannot be scheduled portable tools will be found of great value. This work must be done quickly and much of the work must be carried out in a manner that makes it impracticable to use machine tools. Hand labor predominates in this class of repairs and portable tools work in to greatest advantage.

Special Fixtures Assist in Keeping Machine Tools in Continual Use

MAINTENANCE men generally realize the value of modern methods for doing good work economically. These include carefully laid-out shops, improved facilities and up-to-date tools. They also include careful planning of the work for carrying it out on a previously arranged shopping schedule. Shop schedules properly developed and adhered to are an excellent means of disclosing weak spots in the shop operation and the machinery used. When the methods are not the best that can be developed with the tools available the schedule will lag; if new or more modern tools are needed this weak spot will be found.

A study of the shortcomings will show whether the present machine tool equipment is producing all that can be expected of it. If not, then perhaps the addition of some special fixtures and jigs will remedy the trouble. If the tools are producing all that they are capable of, then improved machines are needed.

Many improvements have been introduced in late types of machines, and new ways of performing machining operations have been brought out. Where a railway can obtain these new tools great economies will result, but where existing equipment must be used attention should be directed to increasing the efficiency of these as much as possible by employment of special fixtures and jigs. Except on large railway properties, electric railway shops will not be able to keep a particular machine tool in constant use on one class of work. To justify the investment in a modern machine it may be necessary to use it for jobs that might be done more economically on other machine tools if they were available. The efficiency of the machine for such work may be improved by fixtures that will reduce the time of setting up and make highly skilled labor less necessary.

From a check made to determine the machine tool equipment most used in electric railway repair shops, lathes were found to predominate. This condition was not unexpected, as lathes have always been considered a repair shop necessity, but the large number of special fixtures and jigs found for use with machining work on lathes indicated that they were being used for many operations usually considered as requiring other machine tool equipment.

It is common practice to bore many parts in lathes when boring mills are not available. Where both turning and boring are necessary on the same part, time and labor are frequently saved by performing both operations with a single set-up of the piece to be finished. Bearing work offers the most common example. There are few railway shops which do not have some form of self-centering chuck or special fixture for machining bearings.

Many out-of-the-ordinary jobs are done on lathes

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by a careful study to provide ingenious jigs and other attachments so that the machine work can be done economically. Special fixtures and methods used for reboring motor shells and compressor cylinders on lathes were described in ELECTRIC RAILWAY JOURNAL for Feb. 24, 1923. Such pieces of equipment are too large to be turned in an ordinary lathe, and the work would probably be considered outside the range of this class of machine without careful thought and attention to the design of the fixtures needed. By clamping the large parts to the carriage and rotating the tools on a boring bar between the head and tail stocks the operation becomes quite simple and the work can be done economically and efficiently.

Shop practices of building up worn surfaces of parts by welding and remachining them are increasing. Many parts which otherwise would be scrapped can be reclaimed for further use by such methods, and much time and labor on machine work can be saved by using lathes to their best advantage. The many examples found where lathes are used with special fixtures for drilling, boring, reaming and milling machine work show that if necessary the usefulness of a lathe can be increased many times by analyzing the classes of work done in the repair shop and then by using the lathe wherever possible. This does not, of course, mean that the work can be done more expeditiously or at less cost than if a special tool were purchased. When the amount of work to be done is quite small the special tool is likely to be out of the question.

The Glory that Is Grand Rapids'

TWENTY-SEVEN modern street railway coaches were placed in regular service by the Grand Rapids Railway, Grand Rapids, Mich., last Sunday. It was a great event for Grand Rapids, but a greater event for the electric railway industry. These new vehicles represent modifications of the "Minnesota," "St. Louis" and "Ohio," model cars run for an experimental period. They are the last word in appointment. On that there is no need to dilate at this time. Their features have been laid before the readers of the JOURNAL before. There is, however, occasion to reiterate the change in attitude toward the transportation problem that the operation of the new cars reflects.

That is the broader aspect of the matter. Locally, the cars mean a great deal. So the Grand Rapids Railway was justified in going to unusual length in staging a parade and demonstration with which to introduce the cars. Here was a product of which the railway management could justly be proud. Here was the occasion for unusual advertising effort. The parade was excellent advertising—advertising in keeping with other progressive things this railway is doing. What could carry a more compelling message than the appearance in the line of march of cars of various vintages from 1880 to the present day? As a publicity idea this is not new, but the new coaches in Grand Rapids afforded a study in contrast never before achieved. In this respect the parade was new.

But that story is told in detail elsewhere in this issue. Only one phase of the new development remains to be enacted. That is the proposed funeral pyre to be made of the old equipment with the public as the invited guest of the railway. In the printed word and on the film the parade and funeral pyre will be broadcast over the land. Patrons of trolley lines all over the country will reflect upon the glory that is Grand Rapids'—a glory well deserved.

New Forms of Transportation Will Drive Railways Into Business

PERSONS who have been predicting the early demise of the railways, both steam and electric, due to the advent of road vehicles, will do well to ponder carefully the words of that veteran transportation man Samuel M. Vauclain, spoken before the American Railway Association at its Atlantic City convention last week. Far from causing the downfall of the railways, he holds that in the next ten years the bus and the truck will feed them a business so enormous that unless they increase their facilities very much they will be unable to handle it.

This view is so sound that it is difficult to see why it has not been accepted by every railway man, both steam and electric. As president of one of the great locomotive manufacturing companies, Mr. Vauclain is vitally interested in the growth of the railroad business. He refuses to be perturbed in the slightest degree. But he does point out that it is necessary not to find fault with the new things which appear as competitors, but to embrace them, enter into them and get the best out of them. That always has been and always will be the secret of progress.

Mr. Vauclain welcomes the automobile as a blessing to this country, because of the opportunity it gives the worker and his entire family to get an enlarged outlook on life. That in itself is one of the greatest blows to radicalism that could be struck. It must be remembered, however, that by the same token the demand of the worker has been increased, not only in wages but in standards of living. Transportation of the old sort is not sufficient. He is willing to pay the cost, whatever it is, for the sort of transportation he has educated himself up to. It is for the transportation man to measure up to this demand and furnish a service that will attract and satisfy the customer. The cost will take care of itself.

American Gears and Pinions Found Satisfactory in English Operation

RESULTS obtained with American gears and pinions as maintained in British shops indicate that they hold up well as compared with the British product, according to an article in this issue by A. E. Roberts. Likewise his story is a good message to American maintenance men as showing the value of the great care used to maintain bearings and accurate centers between gears and pinions. In this way the gears and pinions always mesh on the original pitch line.

British engineers have long maintained that it was necessary to manufacture gear and pinion teeth to very accurate dimensions. Mr. Roberts rather reluctantly admits that even though he is a Britisher he finds that the ten years experience with 356 American made gears on the Southern Railway of England has proved that despite the somewhat less accurate dimensions the American product has proved most satisfactory in service. The careful checking of gear and pinion centers every 100,000 miles insures good alignment and allows the surfaces to wear to accurate dimensions and to take on a very high polish along the pitch line.

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Opportunity Lies Ahead in Local Transportation

At Second Sectional Conference in New York, Prominent Executives Point to Opportunities that Have Developed from Recent Difficulties—Broadened Vision and Increased Courage Needed to Grasp Significance of New Order of Things Brought About by Evolution in Transportation

THE local transportation industry has been satisfied too long with the crumbs. Out of past difficulties have grown broadened opportunities which call for expanding vision, a fresh viewpoint and increased courage. There has been no greater evolution in any phase of modern life than in transportation. But with the coming of the automobile has come a new public demand for rides, and by grasping the opportunity thus offered, the local transportation industry can be built up on a broader and sounder basis. In overcoming some of the difficulties of the past decade there will be reared a more comprehensive local transportation service than has been visualized in the past. Transportation men have been engrossed in the effort to cut the last possible penny from operating costs instead of bending their efforts to obtaining adequate revenues. A 10-cent base fare is more than justified. New and improved cars are essential. But all of these objectives require vision, initiative and courage.

FROM this will rise a new local transportation organization—not a street railway company but a local transportation agency with a street railway department. Easy-going, shiftless methods of the past must give way to a comprehensive approach to the new situation. Broad financial, franchise and organization problems lie ahead, but in the light of this new thinking there is the opportunity for recasting entirely the present status of transportation franchises and the popular conception of local transportation service.

Broadened View of Future Portrayed

This, in substance, is the view of the future portrayed by leading executives at the Second Advisory Council Sectional Conference held at the Engineering Societies Building, in New York, on June 10 and 11. "Appreciation of a new situation in business usually lags behind current development," said General Guy E. Tripp, chairman of the board of Westinghouse Electric & Manufacturing Company. "When business is confronted with an entirely new thing, it is usually either ignored or tacked on to current activity without an adequate appreciation of its significance. There has been no more fundamental evolution in any phase of modern life than in transportation. It is not surprising, therefore, that the coming of automotive transportation has not been accompanied by an adequate appreciation of the new era which is opening up."

Here General Tripp saw an opportunity for building a new local transportation structure out of which will grow a new service to people in modern communities. "Mere purchase and co-ordination of buses does not suffice," he declared. "The situation requires an adequate conception and acceptance of the new order. It affords the opportunity for arousing in the public mind an enthusiasm for such broadened service. From this will rise a new local transportation organization—not a street railway company but a local transportation agency with a street railway department. Easy-going, shiftless methods of the past must give way to a comprehensive approach to the new situation. Broad financial, franchise and organization problems lie ahead, but in the light of this new thinking there is the opportunity for recasting entirely the present status of transportation franchise and the popular conception of local transportation service."

"The electric railway industry needs courage," said W. F. Ham, president Washington Railway & Electric Company. "It has been too long satisfied with the crumbs. The time has passed for talking 6 or 7-cent fares or for following a penny-splitting policy toward revenue. A 10-cent base fare is more than justified, and electric railways should go after it. If this produces an excessive revenue in any particular situation, the slack may be taken out by various combinations of token fares under the base. At the present time, however, there are not many properties that need to worry about excessive earnings. Electric railway investors are not getting a fair return and they are entitled to a definite stand by managements for an adequate fare. Electric railways haven't spent the money to make their service attractive. They have been engrossed with economies and have given too little attention to obtaining adequate compensation which would enable improved service to be given. The industry needs new and attractive cars. Under the conditions which have existed for the past twenty years local transportation has been on far from a sound basis. The time has come for a new point of view and a courageous demand for conditions that will permit the development of local transportation service on a sound basis."

Thomas N. McCarter, president Public Service Company of New Jersey, said that although the in-

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dustry is still surrounded with many pressing problems and difficulties, he could begin to see definite signs of improvement in basic conditions and that the future looked more hopeful than had been the case in 23 years.

Greater co-operation among electric railways and railway executives is needed for the improvement of basic conditions, according to Edward Dana, general manager Boston Elevated Railway. H. M. Addinsell of Harris, Forbes & Company, New York, declared that the investment banker can help little until improvement is made in the basic conditions surrounding the industry.

The policy followed by the Cleveland Railway for improving service was outlined by John Stanley, president. Although no new financing has been undertaken since 1907, there have been 500 new cars added to the service of the Cleveland Railways, and several extensions in track. Authority has recently been obtained from the City Council to scrap 100 cars that have become obsolete for service. To illustrate the importance of the street car in Cleveland, Mr. Stanley said that a recent poll of retail store patrons showed that 78 per cent had come by street car, 18 per cent by autos, and 4 per cent had walked.

"There has been too much apathy about their business among transportation men themselves," declared R. B. Stearns, vice-president and general manager Eastern Massachusetts Street Railway. Although there has been an improvement in the financial status of many railway properties, he pointed out, electric railway bonds on a good earning basis go begging.

"In the years just preceding the world war," said James H. McGraw, president McGraw-Hill Publishing Company, Inc., "the public began turning away from the electric railways. This was partly attributable to the fact that the railways failed to keep up with the times and began showing up in an unfavorable light. The rapid growth of the automobile merely intensified the situation. We can look back now and understand the developments which we were unable to understand then. Naturally railway securities were affected and the vicious cycle thus set up became cumulative.

Broader Vision Needed Now

"But, today, the public is gradually awakening to a new idea. Electric railway service is an essential which cannot be dispensed with and which is vital to the development of modern communities. At this point, railway managements need to recognize the new opportunity afforded them. First, the transportation machine must be put in order. The physical equipment must be made capable of rendering that character of service for which the American public is ready to pay.

"A broader vision and the courage necessary to carry it out are needed by the industry. The electric railway man has not learned adequately to use his local newspapers. Intensive cultivation and well directed advertising can make them a powerful, constructive force. New cars, new methods and a new viewpoint are the need of the hour."

Commenting on the subject of fares, Robert I. Todd, president and general manager Indianapolis Street Railway, said that experience with increases had shown that the volume of riding goes down as the fare goes up, but Joseph K. Choate, vice-president J. G. White Management Corporation, maintained that a 10-cent base fare gives less difficulty than do fractional intermediate fares. He indorsed the need for exercise of courage and vision in going after adequate revenues for local transportation service.

ELECTRIC railways haven't spent the money to make their service attractive. They have been engrossed with economies and have given too little attention to obtaining adequate compensation which would enable improved service to be given. The industry needs new and attractive cars. Under the conditions which have existed for the past twenty years local transportation has been on far from a sound basis. The time has come for a new point of view and a courageous demand for conditions that will permit the development of local transportation service on a sound basis.

More Co-operation Needed

A plea for greater cohesion between the various elements in the industry and greater co-operation and accord in dealing with common problems was made by Lucius S. Storrs, managing director American Electric Railway Association. "Courage is needed in several directions," he said. "First, is the courage to approach the public with confidence in the justice of the railways' case. Combined with this is needed the courage to scrap old equipment that has become obsolete, to find ways of raising money for the acquirement of new cars, and to abandon unprofitable lines which in many instances were unjustified at their inception and have little economic value."

R. P. Stevens, president Penn-Ohio Edison Company, declared that electric railways have operating forces as efficient as those of any industry, but that the problem of the moment is largely a question of a state of mind. Once the industry itself thoroughly believes that it can be put on a profitable basis, a material improvement in present conditions will be effected. With re-established confidence, ways can be found for building riding and increasing fares to a point justified by the character of the service rendered. According to Mr. Stevens, the industry has failed to utilize adequately for the building of traffic the more than a million employees in street railway service.

Other speakers included B. C. Cobb, vice-president Hodenpyl, Hardy & Company, Inc., and chairman of the Advisory Council; G. A. Richardson, vice-president and general manager Chicago Surface Lines; A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company; E. J. Dickson, vice-president United Electric Railways, Providence, R. I.;

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T. A. Kenney, Hodenpyl, Hardy & Company, Inc.; J. K. Punderford, president and general manager the Connecticut Company, and Leslie Vickers, economist American Electric Railway Association. In a discussion of some of the fundamentals of electric railway economics, Mr. Vickers pointed out that taxes collected from street car fares are discriminatory in that street car riders are largely wage earners and consequently least able to pay this indirect form of taxation. Railway managements have not adequately utilized the popular appeal of this condition in discussing the general subject of excessive local transportation taxes.

Copper Used in Electrification of C., M. & St. P. Railway

The Amount of Copper per Mile Used in This Electrification Shows the Important Part Which This Metal Bears in Any Electrification Undertaking

BY R. BEEUWKES
Electrical Engineer Chicago, Milwaukee & St. Paul Railway, Seattle, Wash.

ELECTRIFICATION of the Chicago, Milwaukee & St. Paul Railway extends from Harlowton, Mont., to Avery, Idaho, a distance of 438 route-miles, and from Othello to Tacoma, a distance of 209 route-miles. All power is purchased and is delivered to the railway's 100,000-volt transmission system at certain substation locations. The transmission system in Montana and Idaho is 364 miles long, and the transmission conductors each consist of a No. 00 B. & S. gage, six-strand copper cable. The transmission system between Othello and Tacoma is 186 miles long, including 138 miles of No. 00 B. & S. copper cable similar to that used for the section between Harlowton and Avery, and 48 miles of No. 0 B. & S., six-strand copper cable. Between Harlowton and Avery this transmission line serves fourteen substations, and between Othello and Tacoma eight substations, and in each of these stations there are installed transformers and motor-generators by means of which the current received from the transmission system is transformed to 3,000-volt direct current for use on the trolley system.

The trolley system consists of the trolley wires, contact with which is made by the collecting pantograph on the locomotive, and of the feeder system to which the trolley wires are connected at suitable intervals. The trolley wires over the main track consist of two No. 0000 B. & S. grooved copper trolley wires, hung side by side, and on side tracks of a single No. 0000 B. & S. grooved copper trolley wire. The feeder system consists of one or more 500,000-circ.mil or 750,000-circ.mil copper cables.

In addition to the copper which is used for the four main electrification facilities as herein described, there is also used a very considerable amount for the wires or alternating-current signal system. These wires are mounted on the same poles as those carrying the trolley and feeder wires, and consist of two No. 4 B. & S. copper. These wires furnish current to transformers, relays, track, impedance bonds, and other signaling apparatus, which also contain a considerable amount of copper of which no direct figures are available.

There is also mounted on the trolley poles a so-called power indicating and limiting circuit, consisting of two No. 8 B. & S. wires, which extend practically the entire length of the electrification and which are for the purpose of energizing certain apparatus which has for its purpose the regulation of maximum power demand used by the railway.

The following tabulation has been prepared to show the amounts of copper used in the different facilities involved in the C., M. & St. P. electrification systems:

ELECTRIFICATION—HARLOWTON, MONT., TO AVERY, IDAHO		
Miles main line electrified	437.6	
Miles yards and sidings electrified	141.9	579.5
Miles transmission line		363.6
Substation Apparatus	Pounds	Pounds
Motor-generator sets	400,000	
Transformers	288,000	
Switchboards	48,000	736,000
Locomotives		
10 passenger	274,900	
26 freight	768,300	
3 switching	22,800	1,066,000
Transmission System		
No. 00 conductor		2,382,000
Trolley System		
Trolley wire	3,478,000	
Feeder wires	5,841,000	
Rail bonds	598,000	9,917,000
Signal System		
Primary circuit	599,000	
Secondary circuit	43,000	642,000
P. I. & L. Circuit		
Pilot wire		221,000
Total—Rocky Mountain and Missoula Divisions		14,964,000
ELECTRIFICATION—OTHELLO TO TACOMA, WASH.		
Miles main line electrified	211.1	
Miles yards and sidings electrified	69.8	280.9
Miles transmission line		185.9
Substation Apparatus	Pounds	Pounds
Motor-generator sets	234,000	
Switchboards and transformers	127,000	361,000
Locomotives		
5 passenger	336,000	
16 freight	472,500	
1 switcher	7,500	816,000
Transmission System		
No. 00 conductor	906,000	
No. 0 conductor	252,000	1,158,000
Trolley System		
Trolley wire	1,699,000	
Feeder wires	2,926,000	
Rail bonds	350,000	4,975,000
Signal System		
Primary circuit	281,000	
Secondary circuit	21,000	302,000
P. I. & L. Circuit		
Pilot wire		106,000
Total—Coast division		7,718,000
Grand total, Rocky Mountain, Missoula, Coast Division, lo		22,682,00

From the accompanying table it will be noted that the electrification of the 438 miles between Harlowton and Avery involves a total use of copper per mile of approximately 17 tons, and between Othello and Tacoma of about 18½ tons, or an average of the whole territory per mile of about 17.4 tons, not including a comparatively small amount of copper used for various minor miscellaneous purposes such as lighting circuits in substations, etc., and, as previously noted, for certain portions of the signal system.

The amount of copper used for the different facilities will, of course, vary with the traffic and other conditions that have to be considered in a particular case, but the amounts given in the table as used in the C., M. & St. P. Railway electrification are amply sufficient to allow for future normal expansion of business.

These figures, it is believed, will demonstrate better than any other way the importance of the metal copper in connection with railway electrification work.

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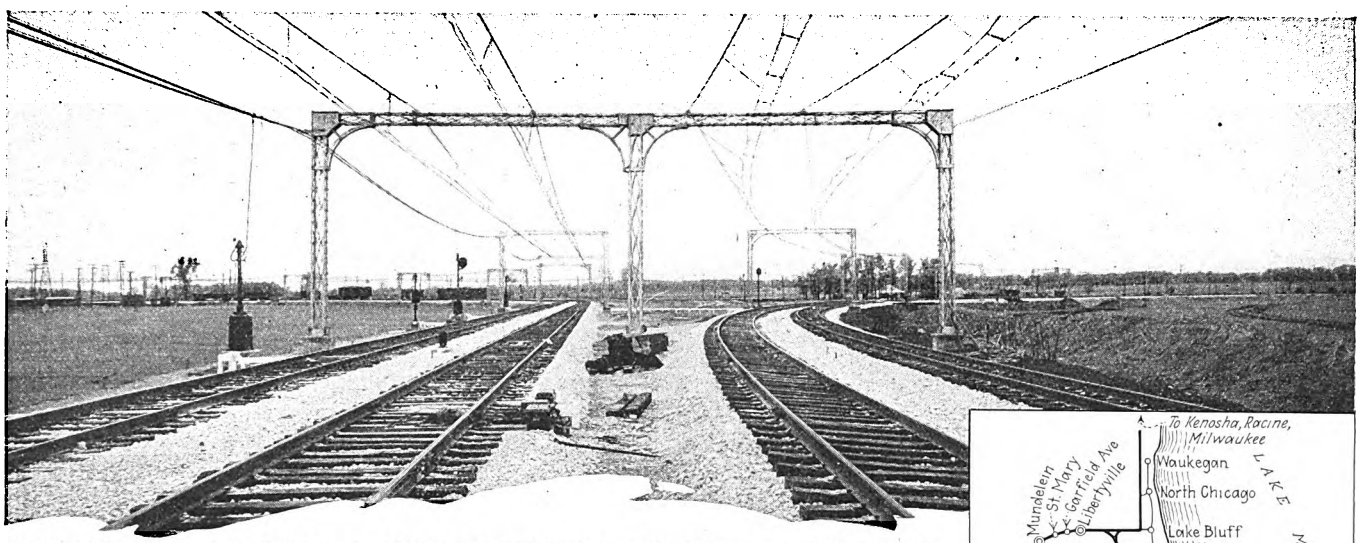

Skokie Valley Line of the Chicago, North Shore & Milwaukee Railroad Joins and Crosses the Libertyville Branch at a Wye at South Upton Junction

This section of four-track right-of-way suggests the ultimate appearance of the line into Chicago, as provision has been made eventually to have four tracks for the entire route. Overhead wires that control cables for the interlocking plant are carried on steel bridges. On the double-track portions single bridges are used.

Skokie Valley Route Gives North Shore Line Widened Territory and Improved Facilities

Ten Million Dollar High-Speed Cutoff of the Chicago, North Shore & Milwaukee Railroad Represents Economical Combination of Railroad and Power Line Right-of-Way, Catenary Overhead Construction, Full Automatic Substations with Supervisory Control, Modern All-Electric Interlocking Plants and High-Speed Roadbed Provided on 22½-Mile New Route

New Skokie Valley Route of the North Shore Line Is from 2 to 4 Miles West of the Original Shore Line

This line leaves the older line at Howard Street, traverses the Niles Center branch to Dempster Street, from which point it runs directly north to the Libertyville branch, and thence east a short distance to join the main line along the North Shore at a point just north of North Chicago. Nine stations have been located along the line for local passenger service. However, at present the line is used for the high-speed Chicago-Milwaukee trains and for freight service. Ultimately, it will be a four-track road from the Chicago "Loop" to Milwaukee city limits. The new route will allow for a running time between Chicago and Milwaukee of one hour 58 minutes, which is eighteen minutes faster than the fastest train on the Shore Line.

DUPLICATE rights-of-way between Chicago and Waukegan are possessed by the Chicago, North Shore & Milwaukee Railroad since the completion of the Skokie Valley line. The old line through the cities and suburbs along the lake is now called the Shore Route, while the new route, some 2 to 5 miles west, is called the Skokie Valley Route from the name of the stream which traverses this valley. This new line represents the most modern practices in high-speed trunk line railroad construction. Its location furnishes a right-of-way with low grades and eliminates the necessity of complicated construction work. In this respect, it is in contrast to the Niles Center division, where many difficult forms of railroad construction were necessitated by the topography and the obstacles encountered.

The new Skokie Valley Route is a continuation of the Niles Center branch, leaving this line approximately ¼ mile south of the Dempster Street terminal. It continues north for a distance of 22½ miles to join the old main line of the Chicago, North Shore & Milwaukee Railroad at a point just north of North Chicago.

Economic Value of Location

Two outstanding points mark the new Skokie Valley route as a practical bit of railroad location and engineering. These are, first, the economic features of its location and, second, the intensive use made of the right-of-way. The line extends along the west side of the Skokie Valley, in the territory between the solidly built-up communities along the lake shore on the east and the towns already established along the Chicago, Milwaukee & St. Paul Railway on the west. The territory is near enough to Chicago so that it is expected that a large commutation business will be built up through the construction of this line. At the same time the road is admirably located to provide freight service for handling materials which will be shipped in for improvements in the territory.

The line traverses a territory through which high-speed operation is possible. This enables the Chicago-Milwaukee limited service to be operated at a speed which reduces the running time between these two towns by approximately eighteen minutes. It also permits high-speed service between Chicago and Libertyville and Mundelein, communities which are developing rapidly. Of course, as the communities along the line grow, conditions probably will change and it will be necessary to meet such conditions by grade separations and other improvements. When that time arrives, how-

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ever, the business of the road no doubt will have grown to the point where this will be justified.

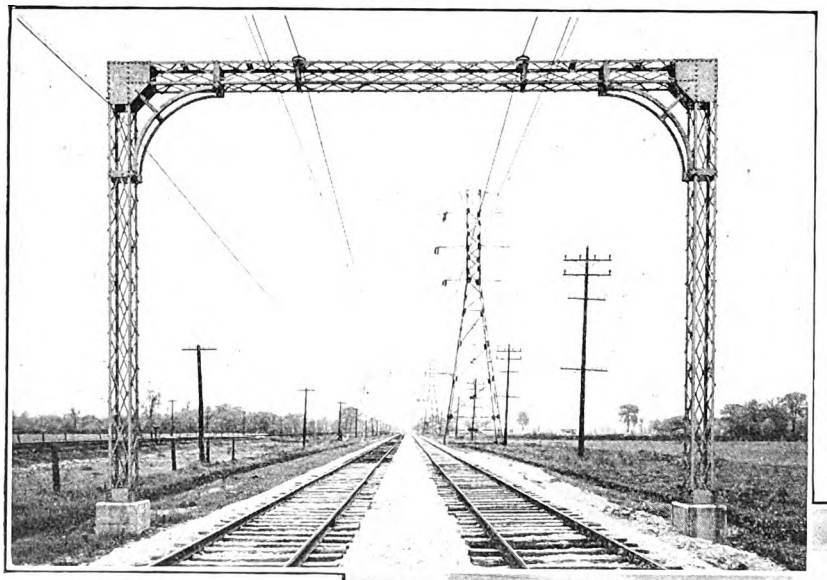
Joint use is made of the right-of-way by the North Shore Line and the Public Service Company of Northern Illinois. The ultimate plan calls for two lines of transmission towers together with supplementary lines of lower voltage, which on account of clearances required because of high voltage make necessary a right-of-way of 135 ft. On account of the spacing of the transmission lines with respect to each other and the adjoining land, it was found possible to locate on the same right-of-way a four-track railroad system. Such a right-of-way, if used alone for railway purposes, would have been at least 100 ft. wide. Thus the use of the 135-ft. right-of-way jointly has resulted in a saving of a 100-ft. strip or approximately 12 acres per mile. Taking into consideration the value of property through that territory, this saving has been considerable. Items common to the two utilities, such as fencing, drainage, and other miscellaneous details, have also been greatly reduced.

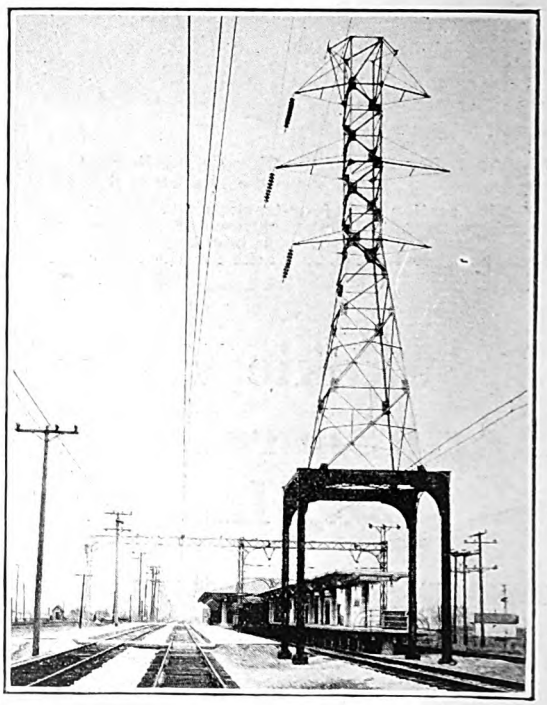
In regard to the construction of the line, the same policy has been followed as was done in the case of the Niles Center section. Everything has been carried out in a permanent manner with the exception of the rails, which through the greater portion of the line are 80-lb. relayer steel installed to meet the conditions due to settlement for the first two or three years after construction.

The design meets all requirements for a high-speed line, connecting the city limits of Chicago and Waukegan without traversing the densely populated suburbs along the lake shore. In view of all of the things that would have had to be done to the Shore Line route to make it comparable with the new Skokie Valley Route, the expenditure of $10,000,000 is a very economical investment. Grade separation on the old Shore Line to make it possible to increase facilities through the various towns would have entailed prohibitive expense. In order to increase the capacity of the original line between Chicago and Milwaukee, to meet the needs of the constantly growing traffic, the most economical solution of the problem was to construct a line on an independent right-of-way near enough to the existing right-of-way to provide for the proper connections between the two lines. Such a location was found in the Skokie Valley, where the new line has been constructed.

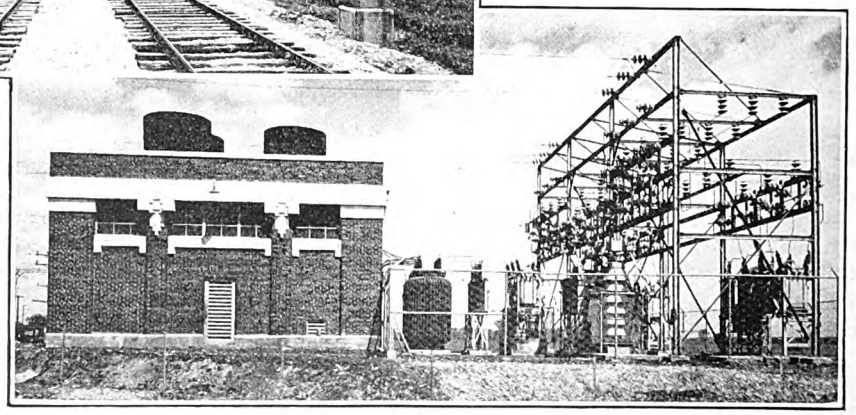
Substantial Line Equipment Is Used on the New Skokie Valley Route

Overhead supporting bridges are of the double expanded steel truss type carrying the catenary messenger on top, which in turn supports the secondary and contact wires. The high-tension tower is used as one supporting leg of alternate bridges. As these towers are 500 ft. apart the catenary supporting bridges in this particular vicinity are spaced at 250 ft. centers.





Power is furnished by five automatic supervisory controlled substations. Four of these are 1,500-kw. rotary converter stations, while the fifth is a 1,000-kw. mercury arc rectifier installation. All stations are of the semi-outdoor type similar to the one shown. High-tension taps are taken from the Public Service 33,000-volt, 60-cycle line which parallels the railroad. No feeder cable is used on the distribution side of the substation the catenary construction providing a conductivity equivalent of 1,200,000 circ.mils per track. These stations are 3¼ miles apart.



Dempster Street Station, used as the terminal of the Chicago Rapid Transit line, showing the island platform for the rapid transit trains and also the grade platform for the North Shore Line trains.

Roadbed Built at Low Grades

Construction of the roadbed provided a right-of-way at low grade. Very few cuts were necessary, although considerable fill work was required at low points in the valley. Material for these fills was obtained from a borrow pit on purchased land. This pit will be made

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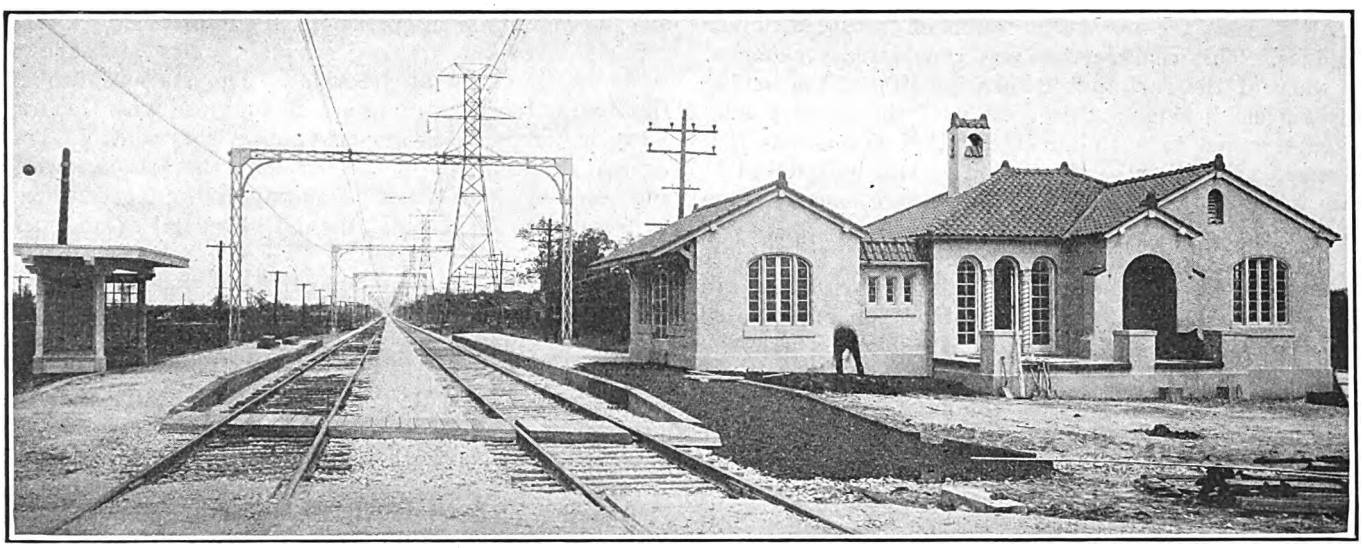


One of the Nine New Combined Stations and Agents' Residences, Which Are of Spanish Design

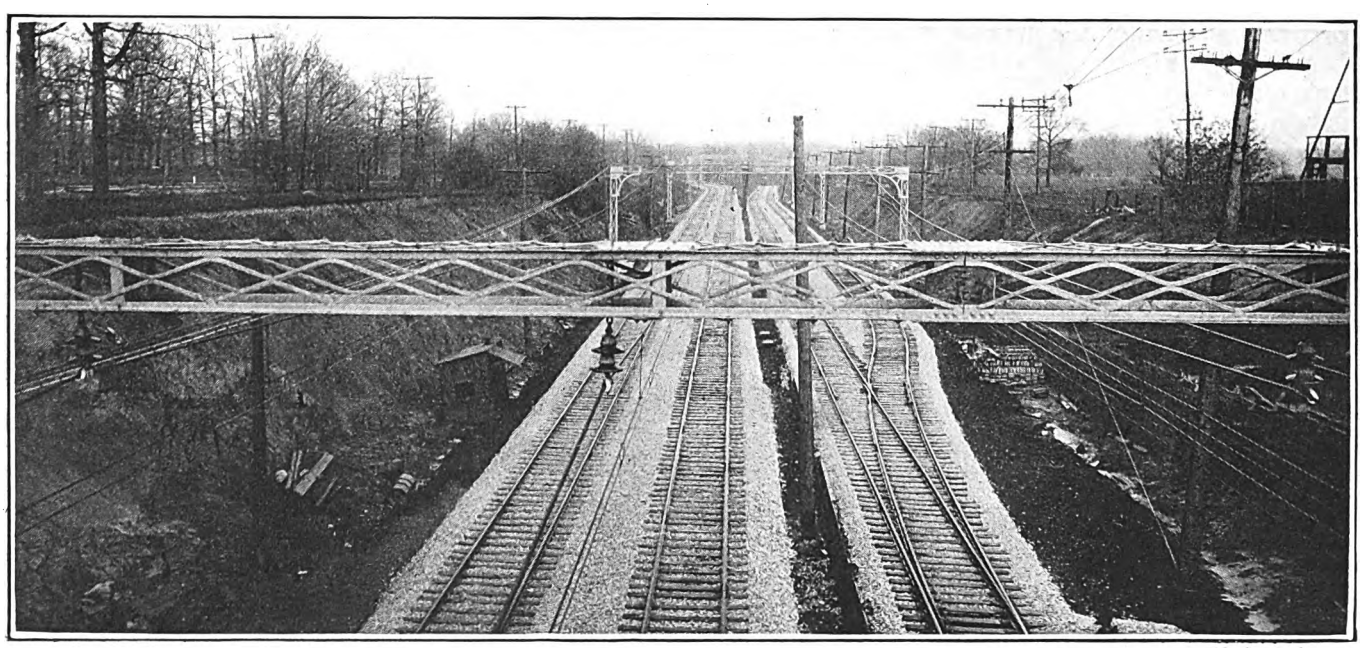
This station consists of waiting room and house for the agent, who acts as representative of the company in maintaining and protecting its property. The building is of permanent construction and may be used as a home after the waiting room facilities have been outgrown by moving it from its present site onto adjacent property. This station cost about $9,500 to build.

into an attractive lake of credit to the neighborhood. From this land approximately 550,000 cu.yd. of fill was obtained. The only extra cost in getting this material was in the construction of a dam for impounding the water and a concrete spillway in this dam. A lake of 43 acres area and a maximum depth of 12 ft. was excavated.

On top of this right-of-way are laid two tracks carried on creosoted red oak ties. Ultimate standard construction of the track will utilize 100-lb. A.R.A. rail supported on tie plates. Because of the eventual settling of the roadbed the present construction is of 80-lb. relayer rail. All curves are for high-speed operation with super-elevation, which permits an operating speed of 70 m.p.h. The grades do not exceed 0.5 per cent, which permits economical freight operation as well as high-speed passenger train service.

The total length of construction amounted to 46 track-miles. Of this amount 42 track-miles is in new construction on the Skokie Valley division and the remaining 4 miles is additional trackage on the Libertyville branch. In addition to this new work the entire Libertyville branch line was rehabilitated for high-speed traffic.

A feature of the construction is the elimination of curves at the crossing of the Lake Bluff cut-off of the Chicago & North Western Railway. Here a change of 4,600 lineal feet of track of the Chicago & North Western Railway was necessary in order that the electric line and the steam line would cross on tangent tracks. However, the crossing is made at such an angle as to necessitate the use of movable crossing frogs. While this adds to the mechanism of the interlocking plant, it insures an exceptionally smooth crossing for speeds of 45 and 50 m.p.h., which are permissible through this particular plant. Similar changes were made in the alignment of the Libertyville branch in order that the crossing of this branch and the main line to Milwaukee would be on tangent tracks.



Where the New Skokie Valley Line Parallels the Old Libertyville Branch Line. The Overhead Bridges Span Four Tracks and in Some Cases Have a Length of 99 Ft.

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All streams are crossed by means of creosoted timber bridges. This construction was considered economical in view of the fact that before the life of the bridge expires conditions in this section of the country may have changed to such an extent that the creeks and streams will either be eliminated or will be reduced in size to permit the use of a culvert where now a bridge is necessary.

In connection with the construction of trestles, it was found advantageous to divert the channel of the Skokie Creek so as to place it entirely on one side of the right-of-way. This eliminated a number of crossings which would have entailed considerable expense, inasmuch as this particular waterway has been deepened and widened by order of the government. The diversion work amounted to 4,000 lineal feet and necessitated 17,000 cu.yd. of excavation and the construction of 3,000 sq.yd. of rip-rap wall.

Summarizing the amount of construction work, it is found that the total trackage in the valley line construction, including the rearrangement and alignment of branch and auxiliary lines, and the Chicago & North Western Railway, amounted to 57 track-miles requiring 601,000 lineal feet of rail weighing 8,080 tons. The total amount of ballast used on this trackage, including cinders on the branch line auxiliary and temporary track, was 4,886 carloads. This trackage is carried on 165,275 crossties, which is the equivalent of 3,700 carloads.

Stations Are of Artistic Design

Beauty and utility have been combined in the design and construction of the nine stations along the route. These follow very closely the Spanish type of architecture. Inasmuch as the adjoining country is at the present time but sparsely settled, it was thought desirable to have a representative of the company live at each of the stations in order to maintain and protect the property. The agent at each station has a modern dwelling that has been built in connection with the station. The room adjacent to the loading platform is the station proper. Back of this is a modern five-room house containing all modern facilities and conveniences for living quarters. A dining room, living room, kitchen and two bedrooms and bath form a very attractive home for the agent.

Even in the construction of these houses, which represent an expenditure of $9,500 each, consideration was given to economy. When the station facilities have been outgrown and it is necessary to erect a large building devoted exclusively to that purpose, the house may be moved to adjoining property and serve as a home. At the present time it serves as a stimulus to those purchasing property in the immediate vicinity to pattern homes after it, not so much in the style of architecture, but in high-class design and construction. Property along the route has risen in value to such an extent that it is almost assured that high-class, expensive homes will be built in the vicinity.

Automatic Substations Include One Mercury Arc Rectifier

Power is furnished to the catenary trolley by five new substations built along the right-of-way. In addition, the new line is tied in with three substations supplying the Shore Line, the Niles Center division and the Libertyville branch. They are 3½ miles apart and are full automatic in operation. Four of these stations contain 1,500-kw. rotary converter units and one a 1,000-kw. mercury arc rectifier. The stations are of the semi-outdoor type and are all equipped with General Electric Company selector-type supervisory control. The substation design is in keeping with the artistic buildings erected along the right-of-way by the North Shore Line and conform with the latest practices in such construction.

Due to the fact that the right-of-way parallels a high-extension line of the Public Service Company of Northern Illinois, it was unnecessary to erect such a line for the railway. Taps at all stations cut in on the 33,000-volt 60-cycle line of the power company, thereby furnishing the necessary energy for the operation of the stations. The high tension is all handled outdoors in an inclosed yard to the rear of the station building.

Distribution of the 600-volt direct current is made directly to the overhead catenary constructed trolleys. No feeder copper is used, the overhead construction being of sufficient conductivity to maintain the proper operating voltage. The catenary consists of a primary copper messenger 1.047 in. in diameter having a brass core. It has a tensile strength of 39,000 lb. Below this is suspended the secondary, consisting of a 300,000-circ.mil copper cable. The contact wire is grooved No. 0000 wire having a 65 per cent conductivity. The combined conductivity per track amounts to 1,200,000 circ.mil.

This overhead construction is supported by means of bridges, some placed at 250 ft. centers and others at 300 ft. centers. The 250 ft. spacing of the bridges was caused by the use of a high-tension power line tower as one supporting leg for each alternate bridge where the railway parallels the power line. However, where the right-of-way leaves the power line, the overhead bridges are spaced 300 ft. The trolley bridges are constructed of Bates double expanded steel. The two uprights and the horizontal member are identical in construction, being joined by heavy gusset plates and bracing. The messenger is supported by an insulator mounted on the top of the bridge. Every 4,600 ft. there is an anchor bridge where the messenger is permanently anchored. This bridge will support the entire overhead construction from that point if messengers should break on one side. The weight per foot of this construction is approximately 4¼ lb.

One of the interesting pieces of construction work in connection with the overhead catenary was the suspension on 4 deg., 7 deg. and 11 deg. curves. On both the 4 and 7 deg. curves the overhead was erected with displaced messenger without pull-offs. In some places on these curves the messenger had a displacement of as much as 106 in. An accompanying illustration shows an example of this special work. On these curves the supporting bridges were especially designed to withstand the side strain.

Track Well Bonded

All track is bonded with 400,000-circ.mil Una bonds which are of the copper arc-weld type. Crossovers and special work are bonded through with copper arc-weld bonds, using long cables to which were welded pigtail bonds. The interlocking plants being controlled by alternating-current track circuits required the installation of heavy impedance bonds at the ends of such circuits.

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In addition to the power facilities, the electrical department also installed a 30-pair telephone cable along the entire right-of-way. Telephones were installed in all passenger stations, substations, towers and in a booth at each crossover.

INTERLOCKING PLANTS ARE OF MODERN CONSTRUCTION

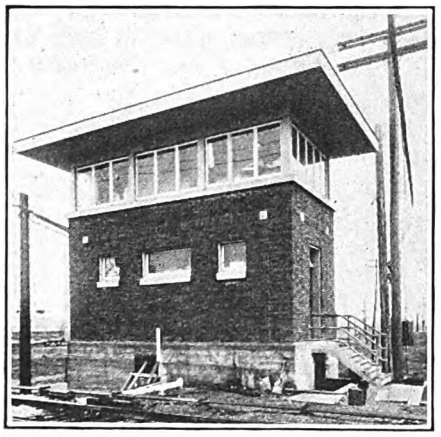
Three modern interlocking plants constitute part of the equipment of the line. The one at Dempster Street at the junction of the new line and the Chicago Rapid Transit terminal is mechanical in operation. The second, 16 miles north of this, is at Skokie Junction. Here the Lake Bluff cut-off of the Chicago & North Western Railway crosses at grade. The third and largest of the plants is at South Upton, where the new line crosses the Libertyville branch, and this branch in turn crosses the main line of the Chicago & North Western Railway. It is at this point that a "Y" was constructed to facilitate the movement of trains in several directions. The plants at Skokie Junction and South Upton are all-electric in operation and are of the latest type of the Union Switch & Signal Company.

At Dempster Street the Chicago Rapid Transit Company, which leases trackage rights over the Niles Center division, has a terminal station with two stub-end tracks alongside an island platform. The new tracks leave the tracks used by the Chicago Rapid Transit Company at a point approximately ¼ mile south of the terminal. Here a manually-operated interlocking plant was installed. The plant consists of a 24-lever machine controlling the diamond crossover for the Chicago Rapid Transit trains and the leads between the C.R.T. tracks and the North Shore tracks. Dwarf signals indicate line-ups both with and against traffic. This plant allows for the by-passing of the station of North Shore Line trains and is in continuous operation during the 24 hours of the day.

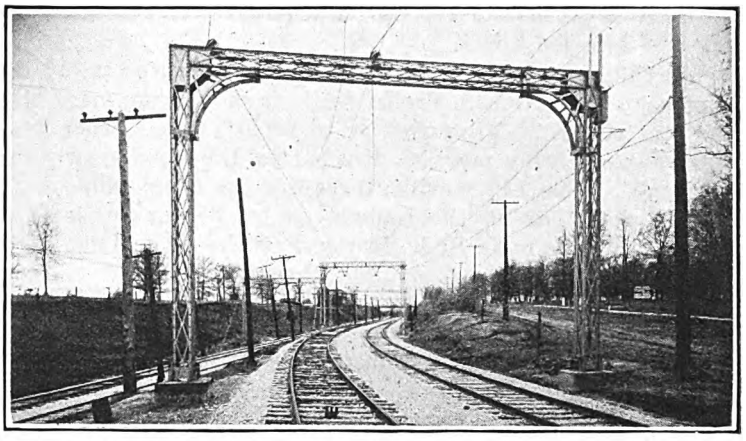
At Skokie Junction the Lake Bluff cut-off of the Chicago & North Western Railway crosses the North Shore Line right-of-way and joins the main line of the Chicago & North Western Railway within the jurisdiction of this plant. The steam railroad formerly had a mechanical plant to handle the movement through its junction. This was replaced with an all-electric plant having 26 working levers on a 31-lever frame. This machine handles both the junction and the North Shore crossing. At this particularly high-speed crossing movable point frogs are used. This necessitated the use of more switch machines than would be necessary with fixed-point equipment. The entire plant is controlled by a.c. track circuits divided into annunciator, home and distant signal circuits. On the steam railroad semaphore signals are used, as this is standard practice on this property. However, on the North Shore Line two-position color light signals are used. Derails protect all line-ups, either with or against traffic. The North Shore Line built the artistic and attractive tower at this location. It is operated jointly with the Chicago & North Western Railway in 24-hour service.

A feature of this plant is its safety in operation. The lever man must put the home signal to normal while the train is in the home block a distance of 500 ft. If this is not done, the machine is automatically locked against further manipulation until a time release allows for further changes in line-up. This time release, which in this particular case is set at two minutes, must be operated to return the home signal to normal if the towerman fails to take the route away while the train is in the circuit. In this installation, the annunciator signal is 4,000 ft. in advance of the distant signal, which in turn is 4,000 ft. ahead of the home signal.

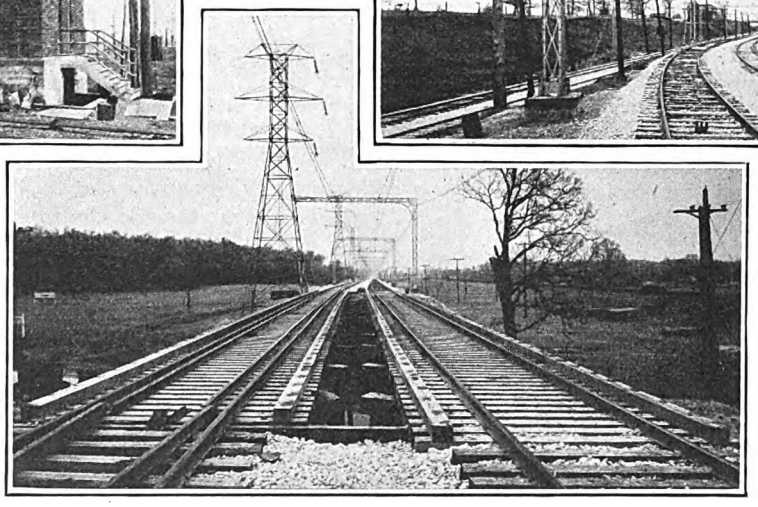
In the interlocking plant installations all wires with the exception of those to the track machines are carried in a marlin-laced cable, carried on messenger, supported



Above is a typical interlocking tower built by the North Shore Line at Skokie Junction and at South Upton. These conform in design and construction with the North Shore standard practice.



On curves of small radius, the overhead construction is carried by displaced catenary without pull-offs. In this particular instance, on a 7 deg. curve, the catenary is displaced 106 in.



Creosoted timber bridges are used to span all streams and highways. This construction has the economic advantage of a small investment, allowing for the bridge location to be changed as conditions in the territory change. The life of these bridges is figured at 25 years, at the end of which time changes may be such as to justify the installation of permanent concrete or steel structures.

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by the trolley wire catenary bridges. Power for the operation of the plant is furnished by a motor-generator set in connection with a battery. This arrangement is of the standard 110-volt d.c. type with 12-volt a.c. track circuit.

South Upton Junction plant is the largest and provides for the greatest number of train movements and line-ups. This type "F" electric interlocking machine has 50 working levers in a 55-lever frame. Twenty working levers are for 32 signals and 30 for four single switches, two single slips, and 22 derails. The frame has two rows of lever lights equipped with 6-8-volt bulbs. The magnets operate on 110-volt d.c. On the wall above the machine is an illuminated track model of the spot-light type. This model has 26 painted sections with 60 lamps, 50 of which are white, eight red and two green. A similar type of track model is also in the Skokie Junction tower.

At Upton Junction it is possible to route trains in a number of directions. Traffic north from Chicago may be sent either to Milwaukee or to Libertyville. From Milwaukee, trains may be directed to Libertyville or Chicago. From Libertyville, three line-ups are possible —to Lake Bluff on the branch, or to Milwaukee or Chicago on the main line. However, trains from Lake Bluff can only be sent straight through the plant to Libertyville. In addition to these switching operations on the North Shore Line, the plant also controls the two-track crossing of the main line of the Chicago & North Western Railway. The plant, equipment and operation, is identical with the Skokie Junction plant. It is all-electric with semaphores used on the steam line and two-position color lights on the electric line.

New Cars Arrive in Time for Opening

Additional rolling stock in the form of 20 new cars of the standard type have been received by the Chicago, North Shore & Milwaukee Railroad for use in limited service between Chicago and Milwaukee. These have arched roofs, smoking compartments, toilet facilities, and are of steel construction, carried on high-speed trucks. Four 140-hp. motors are geared to give a free running speed of 72 m.p.h. This is approximately 7 miles per hour faster than the former equipment of the North Shore Line. The cars are equipped with poles having a trolley shoe through which contact is made with the catenary constructed overhead. Third-rail trolley shoes are also provided in order to allow the equipment to be run over the tracks of the Chicago Rapid Transit Company.

The interior of the car is finished in mahogany. The main compartment is equipped with interurban high-back seats, upholstered in green figured mohair. The smoking compartment has the same type of seat, covered with black leather. The weight of the car is approximately 100,000 lb.

Maintenance Costs Reduced in Fort Worth

Better Inspection and Use of Trolley Shoes and Regular Inspection of Trolley Wire and Supports Are Also Responsible for Fewer Failures in Overhead Construction

CONTINUED use of the sliding contact shoe in Fort Worth on both city and interurban cars instead of trolley wheels has effected important reductions in the cost of maintaining the current-collecting equipment on the cars, and the contact wire itself.

Trolley wire breaks on the 163 miles of city and interurban tracks of the Northern Texas Traction System have been reduced from the peak of 350 in 1921 to 23 trolley breaks for the entire year of 1925. Credit for this reduction is not entirely due to the current-collecting devices but to the rigid and regular inspection of overhead systems and the repair of badly worn places before a break occurs. A description of the early work done in Fort Worth in investigating the current-collecting troubles is given in the issue of ELECTRIC RAILWAY JOURNAL for May 17, 1924, page 767.

Accurate costs of operation have been kept since 1919 to date. Up to 1921 both the city and interurban divisions were operating with trolley wheels. During 1921 the interurban division had installed a number of Miller trolley shoes. In 1922 this replacement was completed and the city division was changed over. Since the beginning of 1923 all cars have been equipped with Miller shoes.

As will be noted from the individual tables and charts, the cost of trolley slides has been reduced on both the city and interurban divisions so that it is now costing a trifle more than 15 cents per 1,000 car-miles on both divisions. Turning to the total cost of material used in maintaining the current-collecting equipment, including the collecting equipment on the cars, the ears,

TABLE I—COMPARATIVE COSTS OF TROLLEY WHEELS AND SLIDES PER 1,000 CAR-MILES

City Division

	1919	1920	1921	1922	1923	1924	1925
Trolley wheels..	$0.324	$0.236	$0.449	$0.306	.....	.....	.....
Trolley slides...	.....	.....	.....	$0.228	$0.237	$0.239	$0.153

Interurban Division

	1919	1920	1921	1922	1923	1924	1925
Trolley wheels..	$0.312	$0.615	$0.896	.....	.....	.....	.....
Trolley slides...	.....	.....	1.639	$1.070	$0.709	$0.507	$0.151

TABLE II—DETAIL COST BY YEARS OF MATERIAL USED FOR MAINTAINING CURRENT-COLLECTING EQUIPMENT AND OVERHEAD CONSTRUCTION, EXCLUDING POLES, FEEDERS AND SUPPORTS

City and Interurban

	1919	1920	1921	1922	1923	1924	1925
Current-collecting equipment	$6,723.01	$6,735.27	$6,545.27	$5,408.50	$4,107.31	$3,529.90	$980.89
Ears, sleeves, etc.	2,470.86	5,690.83	3,298.65	2,301.23	2,504.26	2,472.00	2,289.92
Trolley wire	14,182.77	16,748.64	13,983.93	6,264.67	3,654.54	3,680.54	1,877.19
Total	$23,376.64	$29,174.74	$23,827.85	$13,974.40	$10,266.11	$9,682.44	$5,088.00

TABLE III—RECORD OF TROLLEY BREAKS AND COST OF REPAIRS

	1919	1920	1921	1922	1923	1924	1925
Number of trolley breaks	.....	260	350	191	80	49	23
Total car-miles	8,229,243	9,044,829	8,782,208	8,422,863	8,485,715	8,671,596	8,740,396
Cost per 1,000 car-miles	2.84	3.23	2.72	1.66	1.21	1.12	0.58

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sleeves, etc., of the overhead construction, and the trolley wire, it is noted that the total cost for the property has been reduced from the high point of $29,175 in 1920 to $5,088 in 1925.

The contact wire is greased on a systematic basis once every 90 days in outlying sections and every 60 days in the downtown sections under which are operated the greatest number of car movements. When new wire is strung it is immediately greased. Experience has shown that the cost of greasing trolley wire has been $0.959 per mile of wire on the city division and $1.25 per mile on the interurban division.

Trolley slides are rebuilt on a mileage basis. Formerly, the shoes were allowed to wear down to a certain predetermined depth and were then rebuilt. The shoe now comes down at every overhauling and is rebuilt by welding new material on the worn section. The welded runner is ground to shape and made smooth. The cost for rebuilding shoes averages 16 cents each.

Results obtained during the early trial period from part wheel and part slide operation over the same wire were not good. The wheel formed pits on the wire that increases the wear on both wires and slides. When slides are used on all cars they soon wear down these pits and smooth operation is obtained.

Another noteworthy result is the reduction of noise in the car because the sliding contact avoids the drumming action on the car roof.

Some trouble has been experienced on some roads due to backing up operation. In Fort Worth the one-man operated cars are never backed up without first reversing trolleys. When necessary, interurbans are backed up slowly in a satisfactory manner, with the conductor holding the trolley rope. With the small amount of reverse operation required on the property little difficulty has been experienced from this source.

Insurance Labels for Cars

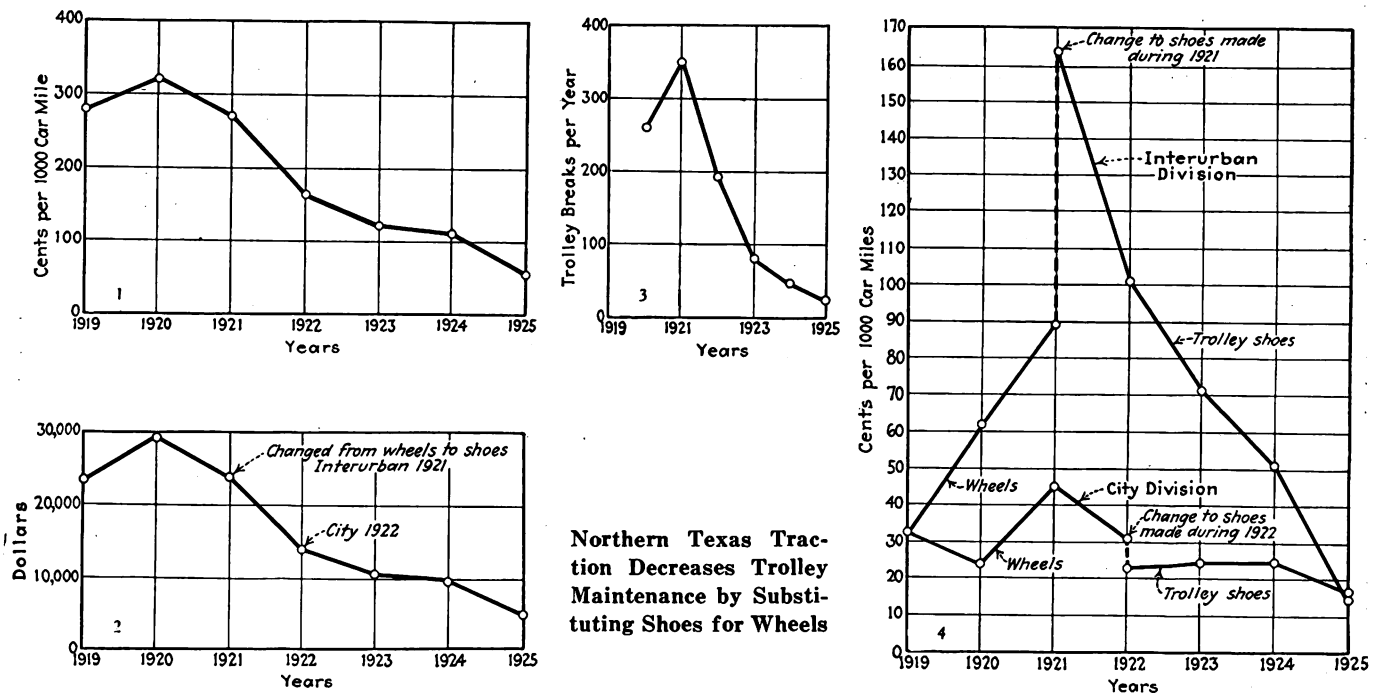
Now Available to Indicate Complete Conformity to Underwriters' Standards—Cars So Labeled Will Have the Benefit of Lower Insurance Rates

THOSE who have not been following fire insurance regulations closely within the last year may not realize that standard labels are now available for complete cars that have been built and equipped under the regulations of the National Board of Fire Underwriters. It is only within the last few months that any cars actually have been so labeled and so have the benefit of the maximum reduction in insurance premium.

The result mentioned is the outcome of some fifteen years of hard work by the insurance companies and the insurance and maintenance departments of the railways. During the history of the movement several committees representing each of these interests have worked individually and together, and their activities finally brought about the 1925 regulations of the National Board of Fire Underwriters for electric railway carhouses and cars.

After the formal acceptance of these regulations by the National Fire Protection Association and the American Electric Railway Association, the question was raised whether the labels of the Underwriters' Laboratories, Inc., would not now be available for complete cars. The fire insurance rating authorities agreed to permit this on all cars whose wiring fulfilled the specifications, and whose equipment, such as wire, switches, fuses and lamp receptacles, was of an approved listed type, and whose heaters had individual labels. The ruling did not require the label for the heavy equipment, such as the controllers, grid resistance and motors.

The first cars to be thus labeled were some recently



Northern Texas Traction Decreases Trolley Maintenance by Substituting Shoes for Wheels

Curve No. 1—Graphical representation of cost per 1,000 car-miles of trolley breaks on the entire system, showing reduction in cost of repairing trolley wire made possible by the use of sliding shoes instead of trolley wheels. Substitution was made during the years 1921 and 1922.

Curve No. 2—Cost of maintenance material for the city and interurban division of the Northern Texas Traction Company showing the saving effected by the use of Miller sliding shoes on both city and interurban divisions.

Curve No. 3—Number of trolley breaks per year on the 163 miles of wire operated by the Northern Texas Traction Company, showing reduction in the number of breaks caused by the use of sliding shoes substituted in 1921 and 1922.

Curve No. 4—Cost of trolley wheels and Miller shoes per 1,000 car-miles. Note the reduction after the substitution. Worn shoes are now rebuilt every time the car comes in for overhauling.

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ordered by the Georgia Railway & Power Company for its Atlanta system. They were inspected in part at the shops of the Cincinnati Car Company, where they were being built, and in part in the carhouses at Atlanta. In this case the heaters were tested as installed because the specifications for the cars were drawn before the institution of the label service on completed car heaters, but in future cars the heaters as well as the rest of the equipment will have to bear the Underwriters' label to secure the complete car label. Obviously, it will not be possible to inspect old cars for labels unless the concealed wiring is uncovered, so that it may be viewed by the inspectors having jurisdiction.

Eventually, it is expected, a considerable credit in the fire insurance rate will apply on cars bearing this label, as the insurance interests will accept only the labels of the Underwriters' Laboratories as evidence of standard wiring and heater installations.

Cars Remodeled on Central London Railway

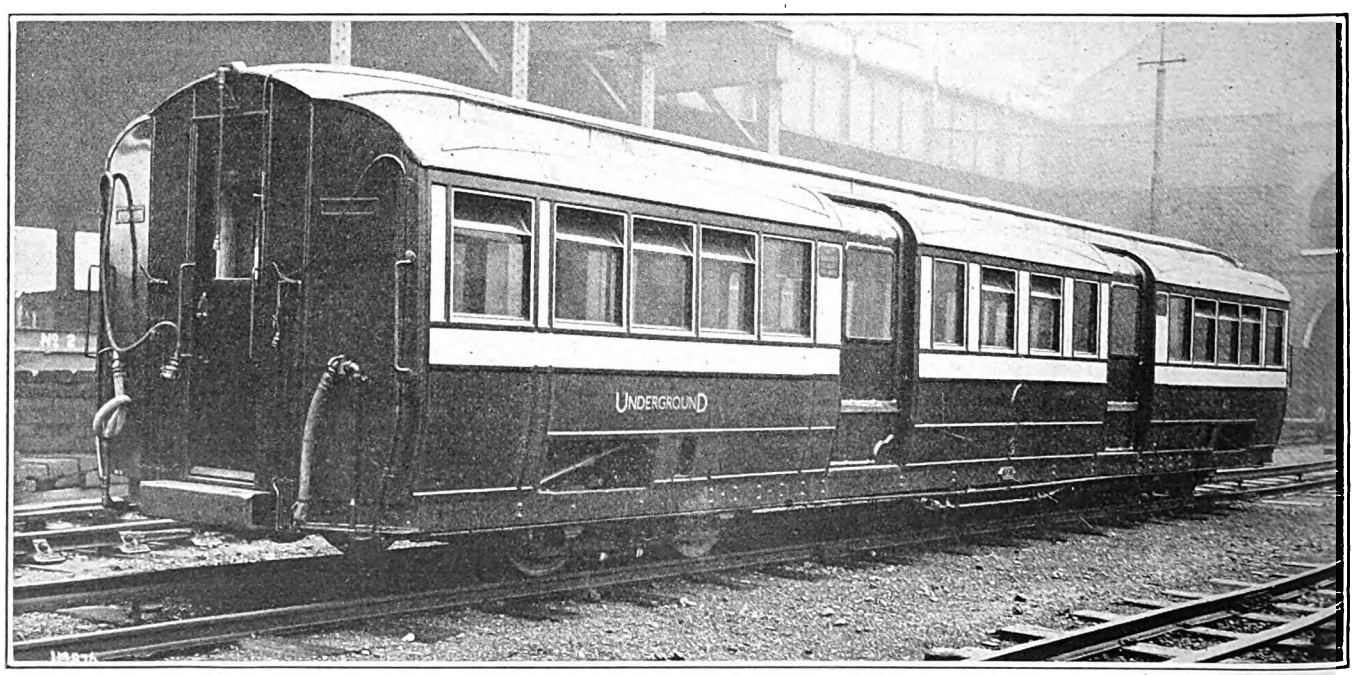
WHEN the Central London Railway, running from the heart of the city to the western outskirts, was opened for traffic in July, 1900, the cars were regarded as sumptuous, but they were all trail cars, electric locomotives being used to haul them. In consequence of complaints of vibration from the tenants of houses above the route, though the railway is at a great depth, the heavy locomotives were superseded by multiple-unit trains. The complaints then disappeared, but in recent times the call has come for improving the cars. A result now is that 250 cars are to be remodeled and refitted throughout to provide the same standards of comfort and efficiency as are now afforded on the Hampstead and City lines. The improvements include more comfortable seats, pneumatically controlled doors, better lights, better ventilation and faster running.

One car has been rebuilt on these lines and the results of a trial run in service have been so satisfactory that the "Underground" will proceed at once to remodel all the rolling stock on the line.

The manually operated gates at the ends of the cars have been removed and the platforms completely inclosed. Passengers step immediately into the compartment instead of having to make a right-angle turn as at present. Entrance and exit are effected through air-operated doors, four being provided to each car. These are spaced equidistantly. Passengers are near to an exit wherever they may be seated and a more uniform loading of the car is the result. Control of these doors can be achieved from any part of the train. On a seven-car train the rear guard controls the doors in the rear part and the front guard the remainder. The safety devices on the air doors provide that during the last 6 in. of stroke of the door engine the pressure is retarded almost to zero so that the door can be easily pushed back by hand. The door edges, further, are cushioned with broad rubber tubing. An ingenious electrical interlocking device secures that the starting signal cannot be given until all doors are closed.

The lighting has been materially improved and is more evenly distributed. A new type of lamp bracket is employed and all lamps are shaded. More ventilators are fitted and a new and simple type of drop window, which can be regulated by passengers, affords still better ventilation. Well sprung seats upholstered in moquette replace the old seats of pegamoid, rattan and wood. The interior decoration is in green and mahogany, giving the car a bright, cheerful appearance. The exteriors of the cars are painted red and cream.

The improved rolling stock will be capable of high speeds. Experience gained with cars of similar type on the Hampstead and City lines shows that at busy points the station stopping times have been reduced from 50 seconds to 25 seconds. On the Central London tube this will mean a saving of considerable time in the through journey. Instead of four motors on the six and seven car trains there will be six motors. This increase will give better acceleration and it is estimated that at least four minutes will be saved.



Cars of the Central London Railway Have Been Remodeled to Conform with the Standards of the Underground System

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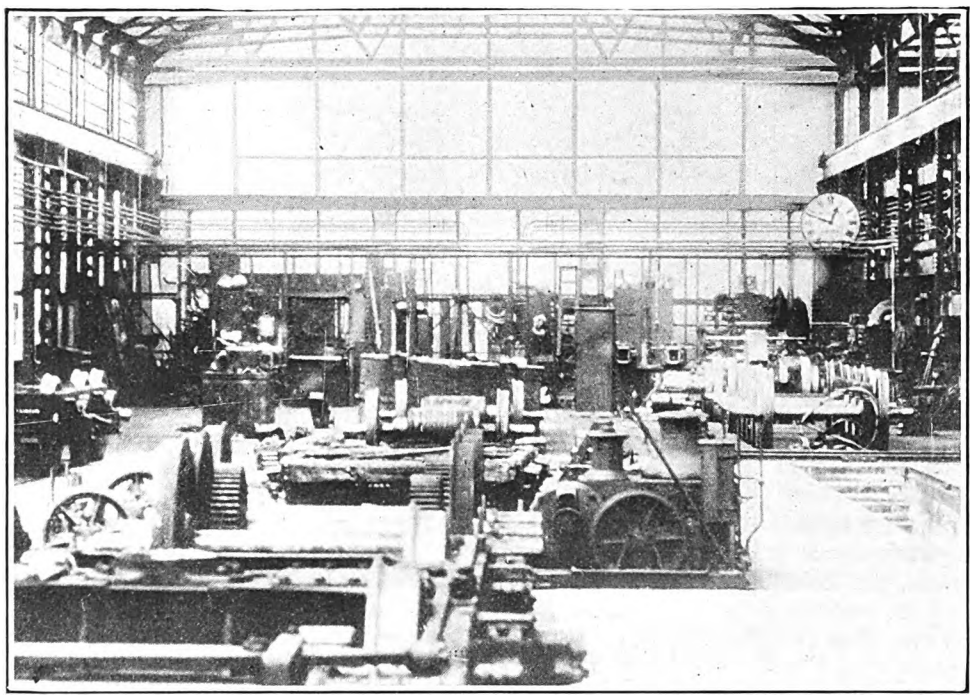
High Standard of Bearing Maintenance Gives Long Gear Life

After an Average Service of 595,000 Miles per Gear, the Maximum Tooth Wear Found Was 0.008 In. and the Majority Showed Wear Between 0.002 In. and 0.005 In. on Electrified Lines of the Southern Railway, England

By A. E. Roberts
Rolling Stock Engineer Southern Railway,
Wimbledon Park, England



Overhauling Shop of the Southern Railway, Where Gearing Is Maintained

MAINTENANCE of a high standard with respect to armature and motor axle suspension bearings has resulted in a surprising mileage obtained from gearing in service on the southwestern section of the Southern Railway of England. The gearing of this equipment is never allowed to get far out of mesh, and the bearings are brought back to their original standard clearance every 100,000 miles. The clearance allowed for new armature bearings is 0.012 in. and for motor suspension axle bearings approximately 0.014 in. In changing armatures or wheels, no attempt is made to keep the gears and pinions paired.

The gearing of these cars was put into passenger service in 1916. A careful inspection recently made as the equipment was going through the shops failed to locate any teeth with wear more than 0.008 in., and the majority showed a reduction of from 0.002 in. to 0.005 in. The condition of the gears is excellent at the pitch line. Below and above the pitch line the teeth are quite dull. The pinions are naturally more polished on the pitch line than the gears, but none was found with greater wear than 0.008 in. to 0.01 in. The root and crown of the teeth are still quite dull, and some showed that they have not yet obtained the bearing surface across the face of the teeth.

None of the gears have been removed for any cause, but nine pinions were removed for apparent fatigue of the structure back of the hardened outside skin. Eight of these pinions were in service for more than four years, and were taken out because they commenced to crumble at the ends of the teeth. The ninth pinion failed in the first year of service; the failure was no doubt due to a crack which developed during the heat treatment. A complete fracture of the tooth for a length of 2 in. from the end resulted.

These gears and pinions were manufactured by the Cincinnati Tool Steel Gear & Pinion Company in the United States. They are heat-treated and are not ground. English manufacturers of gearing have considered that extreme accuracy for railway gearing is essential and the results obtained from American gearing, which is much less accurately constructed, have been watched with great interest. Inspection of the American gears at the time they were placed in service showed that they had cumulative errors over a series of teeth amounting to 0.008 in. Many of the pinion

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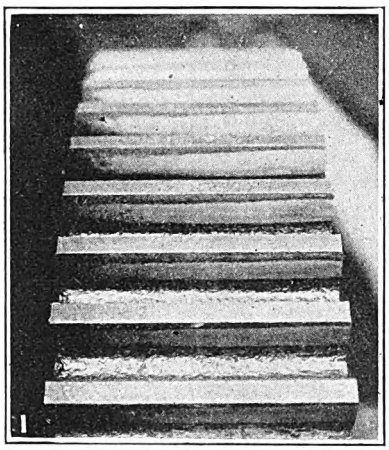
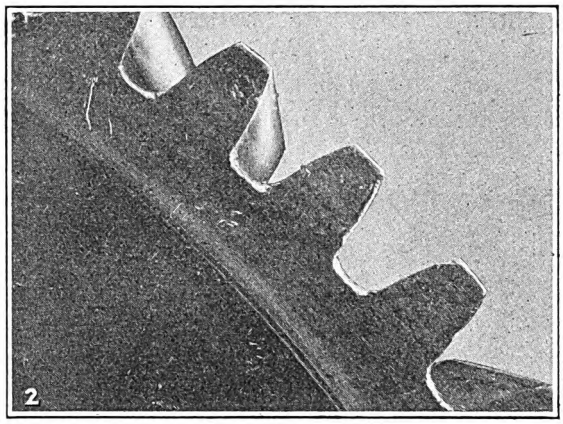
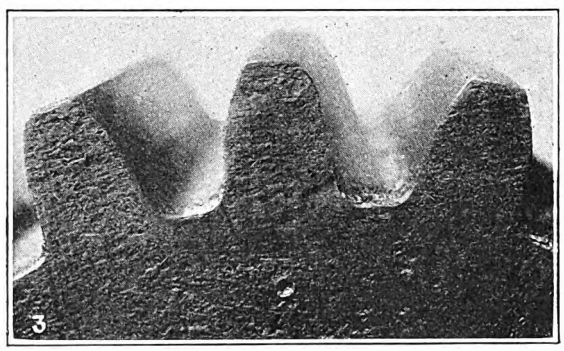
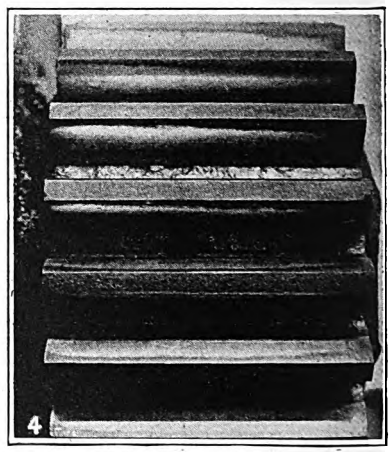
teeth varied as much as 0.005 in. across the face. These variations are no doubt due to the method of manufacture and to heat treatment distortion. However, in spite of their inaccuracies, they have proved very reliable and as silent in operation as any gearing manufactured in England.

On the eastern section of the Southern Railway, 496 sets of gears and pinions of British manufacture have been installed, and an interesting comparison of the service obtained from these will be available some time in the future. These British gears are of high-grade steel and of such high tensile strength that only manufacturers with the highest class of gear-cutting machinery could generate the teeth. The pinions are of a lower grade of steel, cut, heat-treated and ground after treatment. They are extremely accurate in all respects, the teeth being within 0.001 in. and the cumulative errors over five teeth being not more than 0.002 in.



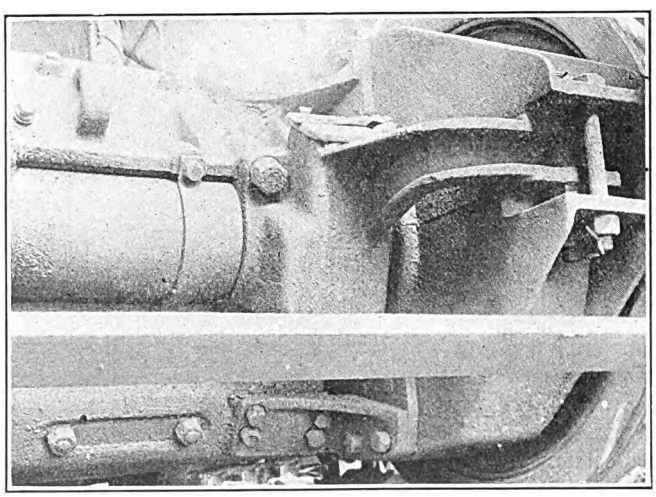






Close-Up Views of American Gears and Pinions After Ten Years of Service
Figs. 1 and 2 show gears and Figs. 3 and 4 pinions after 595,000 miles

It may appear somewhat difficult to reconcile such extreme accuracy in railway gearing, which after being cut requires pressing onto axles. The pinions are forced onto a tapered shaft, which in its turn is fitted to a bearing with 0.012 in. clearance. The bearing is forced into its housing, which in turn is fastened to the motor case. The commercial manufacturing tolerances for all of these fits will, of course, cause spreading of the gearing at the pitch line. Since the gear is pressed on an axle and the meshing of the gear and pinion depends not only on the armature bearings and their housings, but also on the motor axle bearings which support the motor, it may readily happen that the pinion may be in mesh or out of mesh to the total cumulative tolerances and clearances of 0.030 in. or more.



Gear Case Suspension Used. Top and Bottom Center Brackets Were Added to the Original Design

The problem of keeping gears and pinions in proper mesh is one of extreme interest, and although the writer is British, the opinion formed, based on many years of electric traction experience, is that the rough rugged gearing made by American methods is sufficiently accurate for operation in railway service where other factors of clearance and tolerance are quite pronounced.

Not only has the particular make of the American gearing referred to above given exceptional service but gearing on the Metropolitan Railway from 1905 to 1913, which was supplied by the R. D. Nuttall Manufacturing Company of Pittsburgh, showed that no other gears or pinions gave such good results. These were of stub-tooth form and seemed to have an endless life. Conclusions indicate that while extreme accuracy may be desirable in gearing for stationary machinery, it is not necessary for electric railway work.

Some figures as to the service in which our gearing has been used may be of interest. The maximum train weight is 31 tons per gear, and the minimum train weight is 25 tons per gear. Maximum accelerating loads are 325 hp. with driving wheels of 43 in. diameter. A schedule speed of 27 m.p.h. is maintained with an average distance between stops of 1.3 miles, and with occasional service runs that have a distance between stops of 3.2 miles. The free running speed of trains is 54 m.p.h., and coasting at 65 m.p.h. is common.

Gears and pinions are lubricated with small quantities of yellow grease and lubrication depends on the grease thrown on the sides and top of the case falling back on the gear teeth. The 356 sets of American gears in service have a 6-in. face. The teeth are involute with 2 diametrical pitch, the gears having 29½-in. pitch diameter with 59 teeth, while the pinions have 21 teeth.

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Bevel Gear and Worm Drives on Cars

Several Two-Axle Designs Have Been Developed Using Both One and Two Motors—Experiments Are Being Carried On by Several Railways

CARDAN-DRIVE developments on German street cars are discussed in an article by H. Japp, chief engineer Ruhrort District Street Railways, Duisburg, Germany, published in the Feb. 12 and Feb. 19 issues of *Verkehrstechnik*. He notes that General Manager Albrecht of the Dortmund Street Railways patented a cardan drive as early as October, 1918, but his first car was not in operation before June, 1921.

As shown in Fig. 1, the Albrecht drive includes two motors which are suspended from the car flooring. These motors drive a large spur gear through insulated flexible couplings. The outer disks of the same couplings are used for the operating brake.

The movement of the spur gear is transmitted to a cardan shaft on each side. Cardan elements are mounted alongside both the spur gear and the bevel gearing connected to the driving wheels. The combined gear reduction between motors and driving wheels is 9.16:1.

The axles are of Albrecht radial type with 4 m. (13.1 ft.) wheelbase. Tests at Dortmund showed that the car so equipped could negotiate a curve of 21 m. (68.9 ft.) at 35 km. per hour (21.7 m.p.h.) without perceptible shock or noise.

The advantages of the foregoing drive are given as follows:

Complete insulation of the motors against grounding.

Transfer of unsprung motor weight on axles to spring-borne weight suspended from the body.

No bearing trouble to cause falling armatures.

No entrance of foreign matter into motors because of rundown bearings.

Motor weight saving because greater gear reduction permits higher motor speed.

Less shock to motors during acceleration.

Larger gear life because they run in an oil bath and are fitted with greater precision.

Elimination of the tire wear and heavy brake rigging incident to wheel braking.

Easier retardation by means of the disk brake.

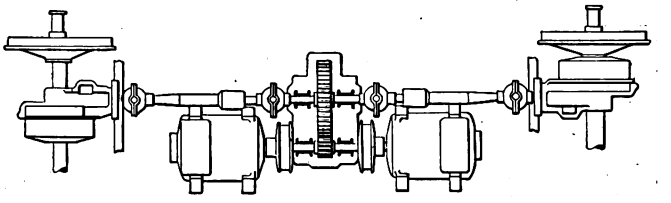

Fig. 1—The First Example of Albrecht-Krupp Cardan Drive Car as Used at Dortmund, Germany

Reduction of unsprung weight increases the life of the track.

Finally, radial axles permit quieter running and easier operation over short curves through the possibility of using a longer wheelbase.

Following 50,000 km. (31,000 miles) operation of the test car, Dr. Miller of Gerthe read an experience paper in the spring of 1924 before a group of operators at Elberfeld. The results were considered so favorable that a number of managements agreed to purchase 25 cars of Albrecht-Krupp cardan drive with the view of interchanging further test data. The first of these cars went into service during January, 1926.

The present cost of a car fitted with Albrecht-Krupp

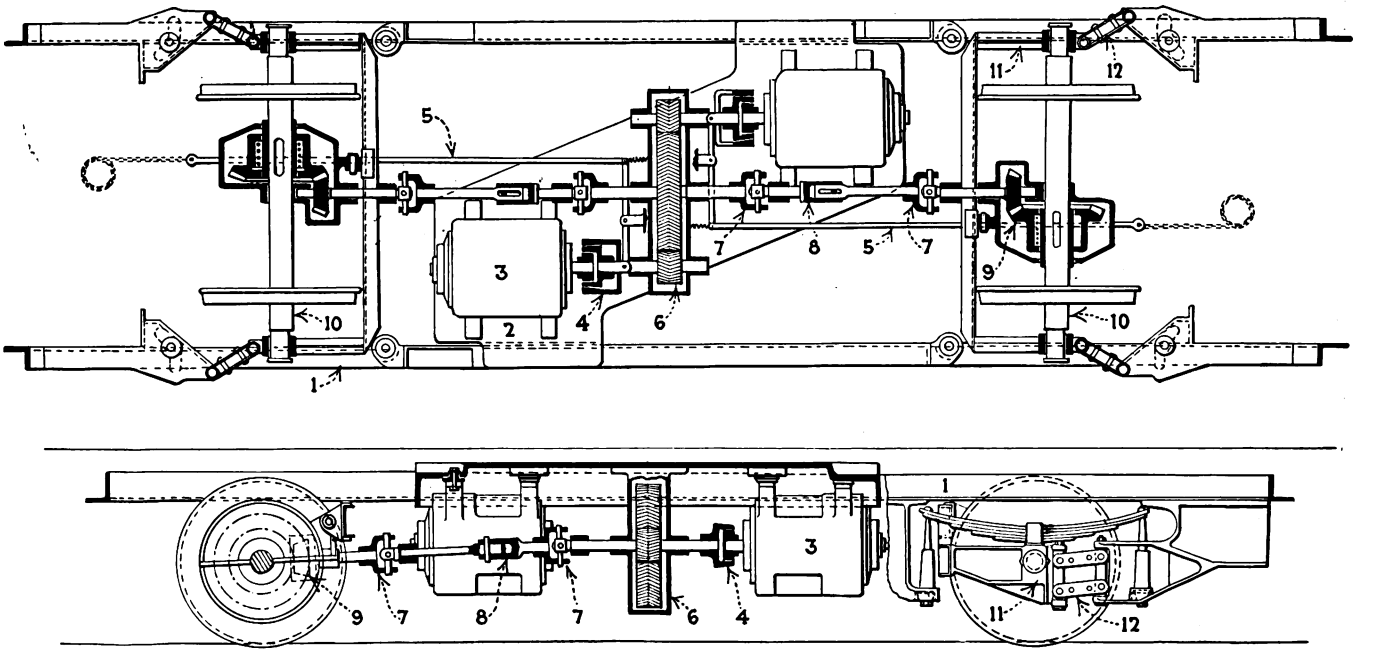

Fig. 2—Plan and Elevation of Cardan Drive Car, Second Type

1—Longitudinal sill.
2—Base plate of motors.
3—Motor.
4—Coupling.
5—Service brake rod.
6—Gearing.
7—Universal joint coupling.
8—Slidable longitudinal coupling.
9—Bevel gearing.
10—Radial axle.
11—Axle frame.
12—Links.

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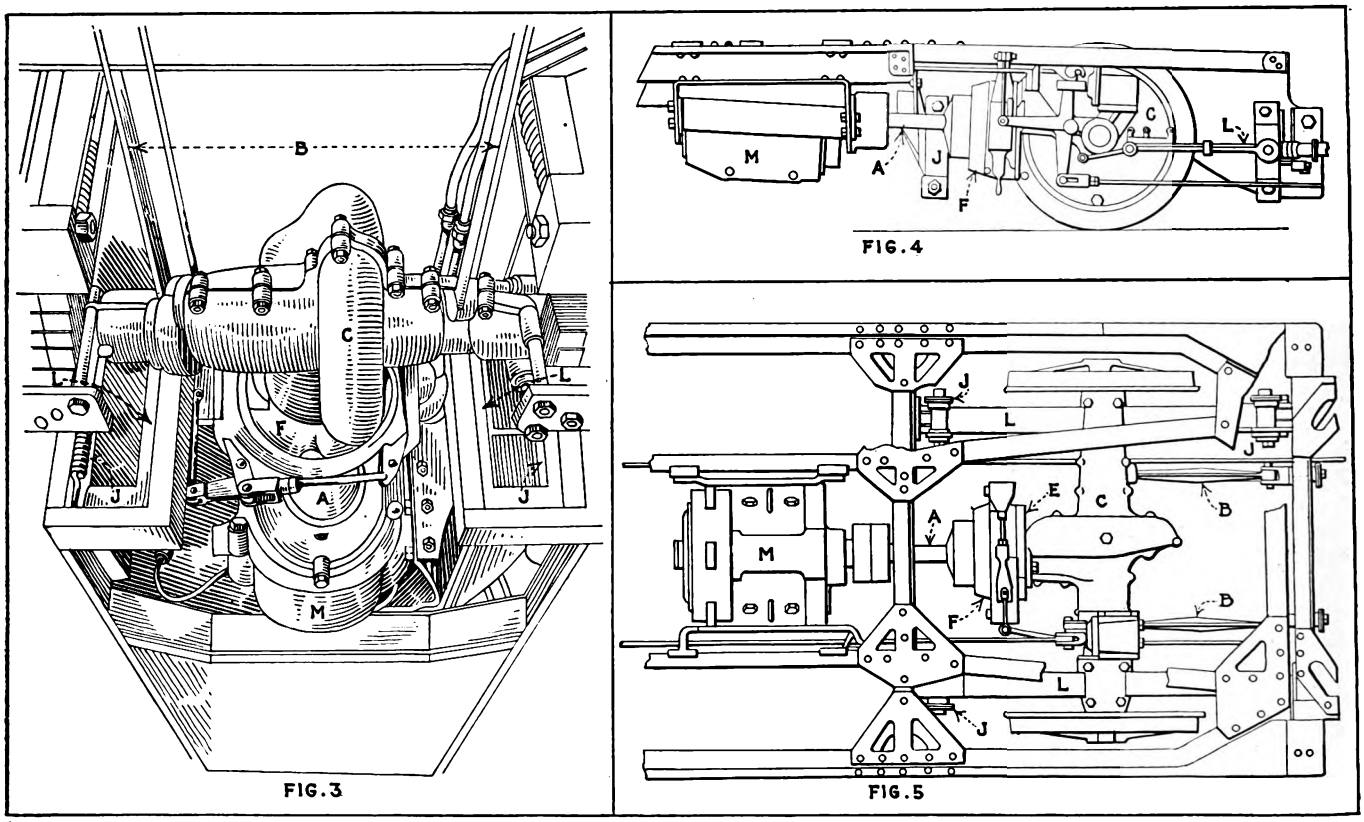
cardan drive and Albrecht radial axles is approximately 10 per cent greater than that of a standard drive and rigid-axle car of equal capacity. It is believed that the lower upkeep cost and other advantages of this drive will more than offset the higher initial cost. The cardan car uses only one controller. Instead of being in line with each other, the motors of the 25-car installation are staggered as shown in Fig. 2,

Because of lack of extensive experience with this construction, the parts were built with a greater factor of safety than appears necessary; but it is believed that later cars could be built 1,000 kg. (2,204 lb.) lighter than the design used hitherto.

In September, 1924, the Berlin Street Railway system equipped car No. 3102 with a combination of plain bearing motors and individual-axle automobile drive,



Paris Car with Cardan Drive: Fig. 3, Seen from Below; Fig. 4, Side View; Fig. 5, Plan
A—Main driving shaft. *B*—Anchor rods for housing. *C*—Gear housing. *F*—Braking drum on main shaft. *J*—Spring hanger. *L*—Leaf springs for body. *M*—Motor.

so one drive remains available if the other fails. The hand brake is equalized to exert the same force on the braking disks of both motors, although this does not so appear in Fig. 2. The emergency brake is of the usual short-circuiting type common in German practice.

The truck, known as the Nolden-Japp type, was designed with particular regard to easy accessibility for all parts of the drive. Pressed-steel framing and a heavy base plate were used, therefore, to avoid cumbersome cross-members. The body is framed so that its end members overlap the truck, thereby avoiding end stiffening members for the truck itself. The body side sills are also clamped around the longitudinal members of the truck as protection against distortion.

The truck carries two Siemens-Schuckert D-340 motors rated at 37 kw. or 50 hp. on a one-hour basis. Each weighs 600 kg. (1,320 lb.) and runs at 1,300 r.p.m. at 550 volts. The first gear reduction is 1:3.84 and the second is 1:2.38.

The wheelbase is 4,000 mm. (13.1 ft.); diameter of driving wheels, 860 mm. (33.9 in.); over-all length of truck, 5,600 mm. (18.4 ft.). The base plate clears the paving by 8 in. when the car is without load. Roller bearings are used wherever possible.

In maintenance, one of the great advantages is that the various parts are more accessible than in the ordinary drive. It is also asserted that the framing plan gives the car greater resistance against collisions.

the latter supplied by the Neuen Automobil-Gesellschaft. The A.E.G. motors, which give 45 hp. at 820 r.p.m., operate through a combination of spur and bevel gearing in one housing to give a total reduction of 1:6.1. The ratio of the spur gearing is 16:40 and of the bevel gearing 14:34. The motors are suspended from the body frame. Disk brakes are used. The wheelbase is 2.8 m. (9.2 ft.) and the driving wheel diameter is 28.4 in. Ten more of this type have been ordered, following satisfactory experience with the first car.

The individual drive scheme of the Berlin car permits the use of shorter wheelbase without too much disadvantage to the cardan drive principle, but the author holds that a long wheelbase is preferable for the sake of easier riding, greater life and lower energy use.

No experiment has been made in Germany with single rather than double-reduction gearing, since this would necessitate the use of heavier, slower and costlier motors without avoiding the need for say a 1:5 reduction. On the other hand, the Albrecht-Krupp drive shows 96 to 97 per cent efficiency in the spur gearing and 95 to 96 per cent efficiency in the bevel gearing. This high combination efficiency permits the use of light, economical motors operated at 1,300 r.p.m. It is held that this efficiency will continue for years, since the Dortmund gearing showed no perceptible wear after 90,000 km. (55,800 miles) of service.

The differences in weight and price of 550-volt motors

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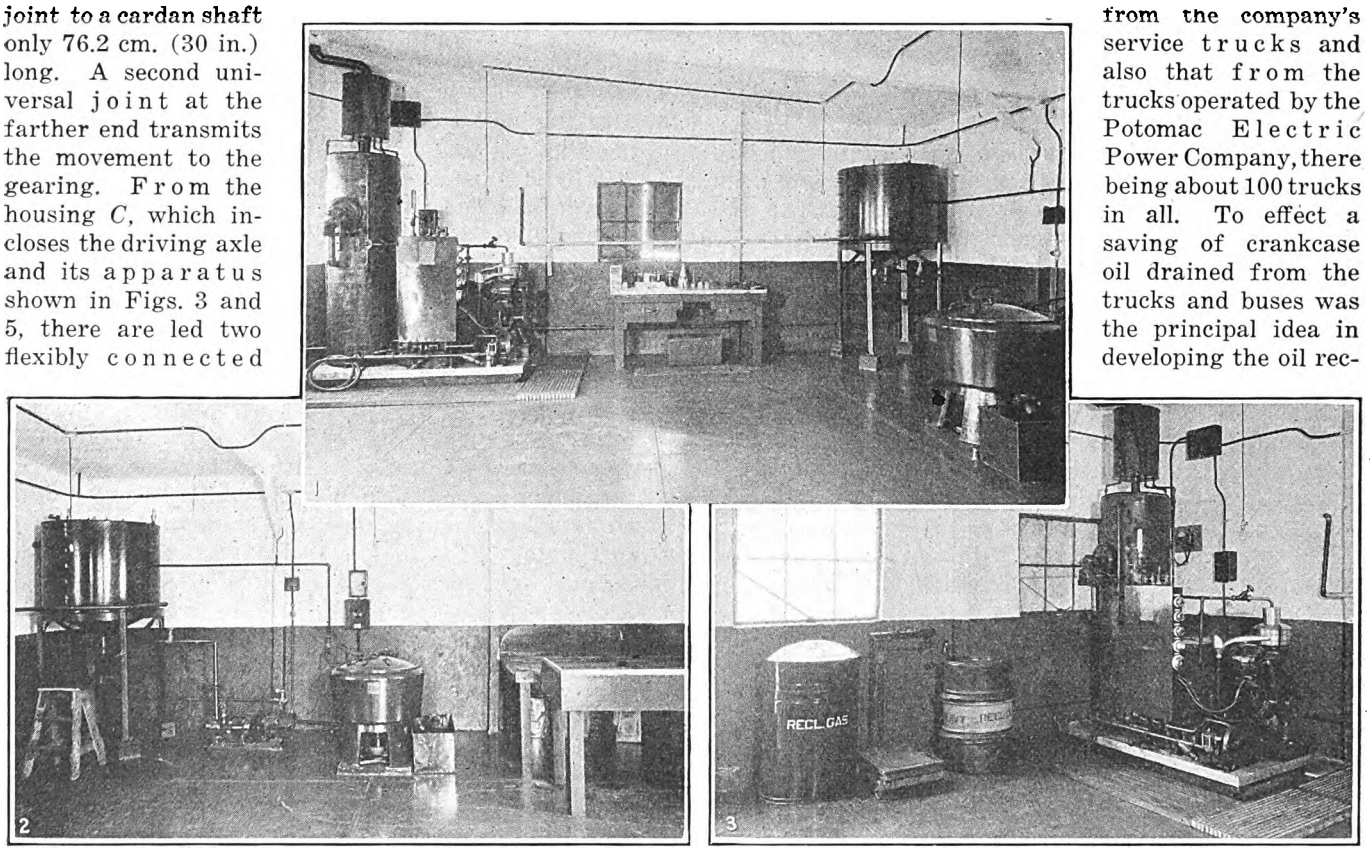
of various speeds is apparent from the following table compiled in the fall of 1924:

Hourly Rating, Hp.	Speed, R.p.m.	Weight, Kg.	Price in Gold Mark
50	1,300	600	2,550
45	820	750	3,000
47	550	1,000	3,600

The first cardan car of the Paris street railway was built in October, 1921. Since then some 500 cars have been built according to the designs shown in Figs. 3, 4 and 5. The new cars permit, for practically the same dimensions and motor capacity, a reduction in car weight from 14,000 kg. (30,800 lb.) to 11,500 kg. (25,300 lb.) and of the unsprung weight from 2,800 kg. (6,160 lb.) to 1,900 kg. (4,180 lb.).

In a Paris cardan car 10.65 m. (34.9 ft.) over all with 3.6-m. (11.8-ft.) wheelbase and 850-mm. (33.4-in.) driving wheels, individual drive is used with one 45-hp., 800-r.p.m. motor per axle. The gear reduction is approximately 1:8, which the author considers too great for good meshing and long life. German operators hesitated to use such a great single reduction, also, because of the lower efficiency.

Each motor is connected by means of a universal joint to a cardan shaft only 76.2 cm. (30 in.) long. A second universal joint at the farther end transmits the movement to the gearing. From the housing *C*, which incloses the driving axle and its apparatus shown in Figs. 3 and 5, there are led two flexibly connected rods, *B*. The function of these rods is to transmit the driving power from the wheels to the car body. Large leaf springs, *L*, and intermediate helical springs (to absorb the lighter shocks) cushion the body against the stresses in the underframe. The springs are graduated for a deflection of 10 mm. (0.4 in.) to the metric ton (2,204 lb.). A special spring suspension is also used to prevent transmission of thrust from the axles to the car body when entering curves. The thrust of the axle causes a contraction of the springs, thereby permitting the axles to assume the proper radial position. Following this action, the expansion of the springs causes the axles to return to their normal position.



Oil and Waste Reclaiming Equipment Installed by Washington Railway & Electric Company

1. At left, oil reclaiming outfit with fume condenser. In center, table for test products. At right, tank for dirty car oil.
2. At left, car oil tank. In center, pump for handling car oil and centrifugal waste extractor. At right, waste picking tables.
3. At left, storage cans for reclaimed gasoline and oil. At right, oil reclaiming equipment.

Car and Crankcase Oil Reclaimed in Washington

New Oil and Waste Reclaiming Plant of Washington Railway & Electric Company Reclaims Crankcase Oil for 14 Cents per Gallon and Car Oil for 5 to 6 Cents per Gallon

ON THURSDAY, May 11, a group of street railway and bus operating officials representing several large Eastern systems inspected the new oil reclaiming department of the Washington Railway & Electric Company, Washington, D. C. This department is located at the company's repair shops and is housed in a separate 30-ft. x 30-ft. one-story building erected and equipped especially to reclaim oil and waste used to lubricate the electric cars operated by the company and to reclaim crankcase oil used in the 30 buses which are in operation. In addition, the plant handles the oil drained from the company's service trucks and also that from the trucks operated by the Potomac Electric Power Company, there being about 100 trucks in all. To effect a saving of crankcase oil drained from the trucks and buses was the principal idea in developing the oil reclamation department, but since it was shown that at small additional expense the equipment could be adapted to reclaiming the car oil and waste as well, a complete recovery plant was finally decided upon.

The principal unit in this recovery plant is a No. 300 De Laval crankcase oil reclaiming outfit with fume condenser. This is a complete unit, containing all the equipment necessary to restore used crankcase oil to its original state of efficiency. The outfit consists of a

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centrifugal oil purifier, for removing from the oil such impurities and water as it may contain; a wash tank, for chemical treatment and washing the oil in order to remove colloidal carbon; a motor-driven pump; electric oil heater, for keeping the oil at proper temperature during the process of purification; air blower and evaporating tower to restore the oil to its proper viscosity; strainer; sight-flow glass; electric control board and all piping and valves.

Reclaimed Oil Used Same as New

Crankcase oil reclaimed by this outfit is used in exactly the same manner as new oil, being put into drums and sent to the garage for use as needed, there being no effort made to refill with oil containing a certain percentage of new oil mixed with the reclaimed product. Oil recovery amounts to about 80 per cent, the 20 per cent loss consisting of dilution and solid impurities or water. The fume condenser furnished with the De Laval crankcase oil reclaiming outfit condenses most of the gasoline evaporated from the oil, so that in reality the losses are even lower than the above figure would indicate. This reclaimed gasoline is used for washing purposes, and it is stated that the men in the shops prefer it to new gasoline, since it contains a small amount of light oil and consequently does not dry out their hands.

The cost of reclaiming crankcase oil is approximately 14 cents a gallon. The outfit handles oil in batches of 50 gal. each and the average time required to complete the process is eight hours. This time element, however, depends very largely on the amount of dilution in the oil, since the removal of dilution is by far the longest step in the process.

Oil is reclaimed from waste by means of centrifuging in a 26-in. motor-driven De Laval extractor. This machine is equipped so that steam under approximately 5-lb. pressure is blown through the waste while it is being spun, producing a fairly good washing action. This spinning with steam is continued for ten minutes, after which the steam is shut off and the extractor is allowed to run ten minutes more at full speed in order to wring as much water out of the waste as possible.

The same oil purifier used with the crankcase oil reclaiming outfit is employed to centrifugalize solid impurities and water out of the oil reclaimed from waste.

Old Axle Oil Used for Rough Lubrication

The reclaimed car axle oil is not used again for its original purpose as the company uses a large amount of low grade oil for rough lubrication, and finds it economical to end the reclamation process at a point where the oil is suitable for this rough use rather than carry it on to a point where it would be suitable for reuse in the car journals. In this way a couple of cents a gallon is saved on the cost of reclamation without adding anything to the cost of new oil. Car axle oil can be reclaimed at from 5 to 6 cents a gallon.

The company uses a good grade of wool waste which is high in cost but economical to use when a suitable reclaiming process is employed. Recovery of waste averages about 85 per cent and the process costs about 4 cents a pound. The recovered waste is mixed about half and half with new waste and is used again on all bearings. No washing process is employed for waste recovery, the product coming out of the centrifugal extractor grit free and with the colors bright, although somewhat smudgy in spots. That this smudging is not considered detrimental is proved by the fact that the reclaimed waste is used even on motor bearings.

Other equipment in the plant consists of a 225-gal. De Laval tank in which dirty car axle oil is stored, heated and settled before purification, a 1¼-in. De Laval pump handling the car axle oil, a waste picking table, a combination picking and drying table for waste and a metal covered bench for samples, tools, etc.

One man operates the entire oil reclaiming plant and is often able to spend a good part of an eight-hour day at work in the repair shop proper. It is planned eventually to reclaim compressor oil from the cars and the light oil used about the shop for flushing purposes. At this time the waste-saturating operation which is now performed in the repair shop will probably be moved to the oil reclaiming plant and the waste will be washed in purified flushing oil as a pre-saturating step. When this is done the oil plant will probably require the constant attention of the man in charge.

European Studies of Rail Corrugation

IN A PAPER presented at a meeting of the French Electric Railway Association in Lyons last October, an account was given of studies on the nature of rail corrugation by Mr. Clère, way engineer of the Paris Tramway Company. Briefly, Mr. Clère's studies led him to the conclusion that corrugation would best be resisted by a tough, medium-hard steel rail with high elastic limit. In consequence, several sections of rail have been installed on the Paris Tramways under similar conditions of service but with different compositions and physical characteristics. As yet these sections have not been in use long enough to give definite results.

Tests of a different nature on the same subject, conducted under the direction of some of the rail mills in Germany, are described in a recent issue of *Verkehrstechnik*. Cylindrical disks or rollers of steel, whose peripheries were in contact with each other, were revolved under pressure. When these disks were of the same hardness, only the upper one showed any tendency to corrugate. When the upper disk was softer than the lower one, light corrugations could be noticed to appear and disappear on the upper disk as the metal wore away. In the opinion of the investigators, the primary cause of these corrugations was the vibration of the springs used to provide the pressure on the disks. It was also found that the greater the pressure the greater the corrugation on the softer disk, whereas the harder disk did not become corrugated until a pressure of 100 kg. (220 lb.) had been applied for a long time.

Later tests with similar disks by another observer were conducted to determine the effect of different amounts of slip between the revolving disks. As the slip was increased by ½ per cent gradations from ½ per cent to 2½ per cent, the corrugations became more pronounced. There was also an increase in the wear of the metal of from 350 per cent to 400 per cent between the ½ per cent and the 2½ per cent slip.

The author of the article in *Verkehrstechnik* concludes that while none of these tests gives a clear answer to the cause of corrugation, there is hope that the problem will be solved by correlating a large number of scientific tests rather than working from results obtained from rough observations.

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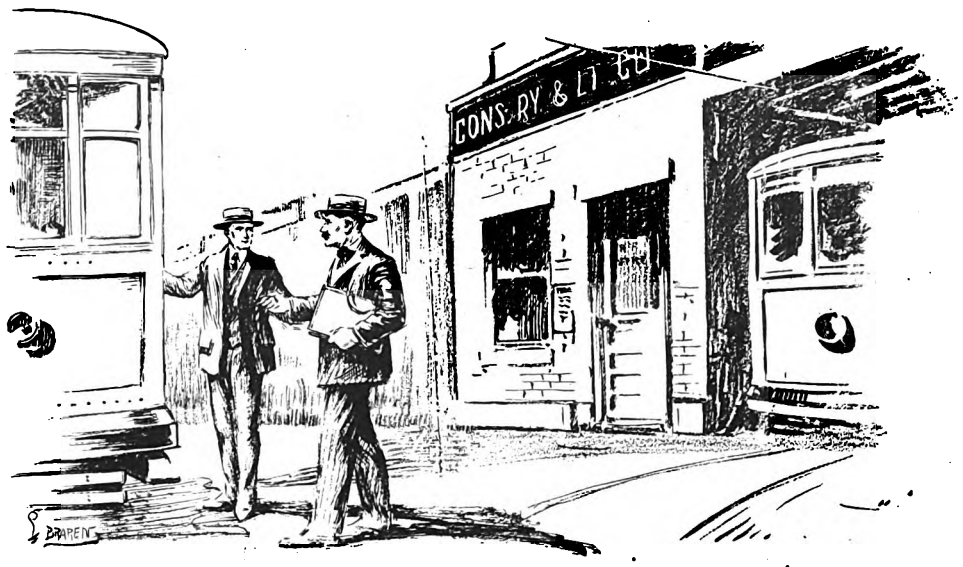
Dick Prescott Gets a Summons

And Makes a Trip Downtown



ABOUT a week after Dick Prescott, engineer of equipment of the Consolidated Railway & Light Company, had presented his report to Thomas Mullaney, general foreman, showing the saving that could be made by scrapping the old 200 class cars instead of rebuilding them, he was again called to Mullaney's office.

"Good morning, Mr. Mullaney," said Dick as he entered the general foreman's office.

"Hello, Dick," replied Mullaney pleasantly. "I've got some good news for you. I took up your report at the staff meeting yesterday and Mr. Milburn, the general manager, wants to see you downtown at 11 o'clock."

"Today?" queried Dick a little nervously.

"Yep. The whole staff is sold on your idea and the boss wants to go over your report with you."

"Gee! That's fine. It was mighty good of you to give me credit for the suggestion."

"Not at all. The whole plan is yours and Mr. Milburn is pleased with the way you handled it. You can go ahead with your work until about 10 o'clock and then I'll go downtown with you."

Dick started back toward his office. On the way he stopped in the carpenter shop to see his friend Steve White, the foreman, who had helped in working out the report on car maintenance.

Steve was delighted to hear the good news. "There you go, old boy!" he exclaimed, clapping Dick on the back. "Your days in this shop are numbered. They need men like you downtown, and that's where you're headed just as sure as shootin'."

"Nonsense, Steve, Mr. Milburn simply wants to go over the details of the report."

"Yes, I know that all right, but you just bet your bottom dollar he wants to look you over carefully at the same time."

Dick laughed at the enthusiasm of the carpenter foreman. "I'll be around here for a long time to come, Steve. There's lot's of work for me right out here in the shop. Mullaney's going down with me this morning and I'm hoping we'll succeed in getting rid of those old battleships for you."

"That can't come too soon for me. If we had the right kind of accounts out here they'd have been gone long ago. This company never will know how much money it's sunk into some of those old cars. It'd certainly be a shame to rebuild them again."

Dick left his good friend and went on to his office. It was difficult, however, to keep his mind on his work.

"Is there anything in Steve's idea?" he wondered. "Is a wider opportunity about to open up?"

These thoughts kept buzzing in his mind despite his effort to shake them off. Finally, as the hands on his watch crept around toward 10 o'clock, he laid aside his work and started back toward Mullaney's office. He found the general foreman ready and the two men left the shop together to board a downtown car.

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Maintenance Notes

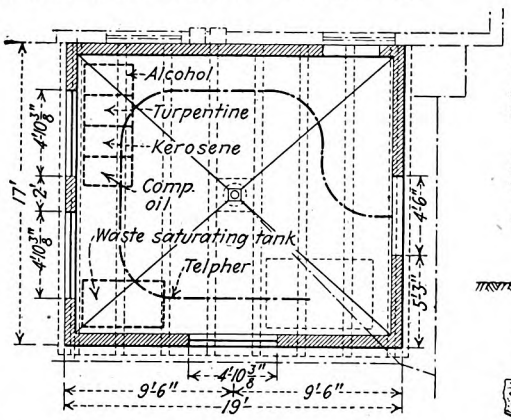
Oil Handling Facilities Improved

BY H. T. HURLOCK
Engineer Rolling Stock & Shops Eastern Massachusetts Street Railway

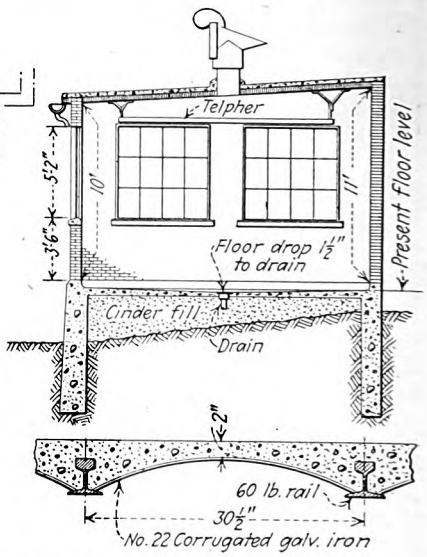
FACILITIES for handling car lubricants have been greatly improved at the Chelsea shops of the Eastern Massachusetts Street Railway by the addition of a new fireproof oil house, designed and built by the shop forces. An automatic waste-saturating machine has been installed which provides saturated waste for the seven divisions north of Boston.

A sheet metal waste tank with compartments for both dry and saturated wool waste has also been installed. This tank is equipped with a hinged cover and counterbalance, the counterbalance cable being provided with a fusible link. Prepared wool waste is put up in metal containers and delivery to the divisions is made once each week. Self-measuring pumps of 1-bbl. and 2-bbl. capacity have been installed to provide storage for the many kinds of oils and greases that are used for the various purposes on the system.

Light wiring is run in conduit attached to roof girders in accordance with the state laws and Fire Underwriters specifications. Lamps are provided with vapor-proof fittings. Steam heater coils are installed around three sides of the oil house and connected with the shop steam system. General dimensions of the new building are 19 ft. x 17 ft. Inside height is 11 ft. The foundation is of 1-2-4 concrete mixture reinforced with scrap iron. Walls are built of hard well-burned brick, using cement mortar, tempered with a small quantity of slaked lime. The floors are of 4-in. concrete, with ¾-in. wearing surface and a 1½-in. drop at the center. A hinged strainer set in the floor is connected to the shop drain which can be seen in the center of the floor.



Convenient Arrangement of Tanks in New Chelsea Oil House

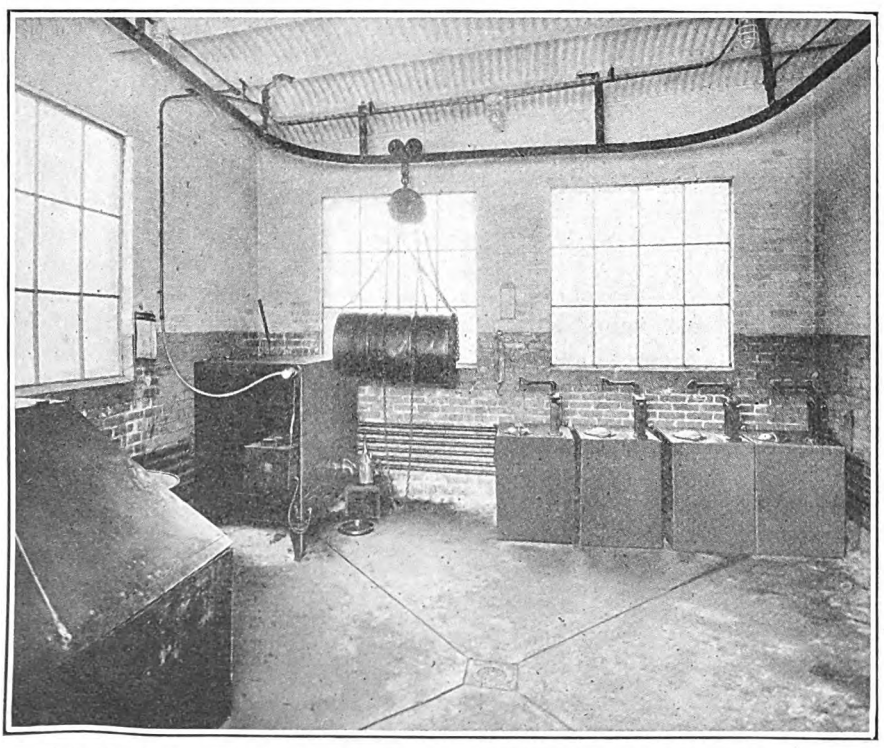


At Top, Ventilation and Drainage Have Been Amply Provided For. Below, Segmental Arch Roof Construction

A segmented arched roof with 1:17 pitch has been constructed of second hand 60-lb. tee rail, set on 30½-in. centers. Corrugated galvanized iron, No. 22 gage, curved at right angles to the corrugations, was set between the rails and a 1-2-4 mixture of concrete poured to a depth of 2 in. above head of rails to form the roof. A coating of ⅛-in. elastic cement was applied to the roof for purpose of waterproofing.

A hand-operated telfer system runs from the receiving door around the oil house about 2 ft. from the walls. This is suspended from roof girders and equipped with a chain hoist for carrying oil drums to the several permanent tanks.

Two sliding fire-proof doors have counterbalances equipped with fusible links. There are three steel sash windows, each containing twelve lights of wire glass 14 in. x 20 in. Ventilation is secured by a 16-in. Acme rotary ventilator.



Construction of This Commodious and Well-Equipped Oil House by the Eastern Massachusetts Street Railway Has Greatly Facilitated the Handling of Lubricants

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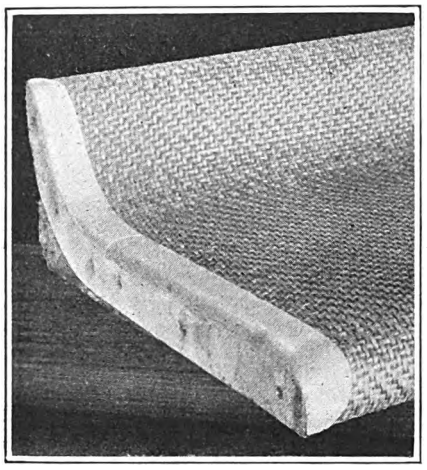
Aluminum Protection Saves Seat Ends



A Protected End Casting Made of Aluminum Has Proved of Advantage in Increasing Seat Life in Erie

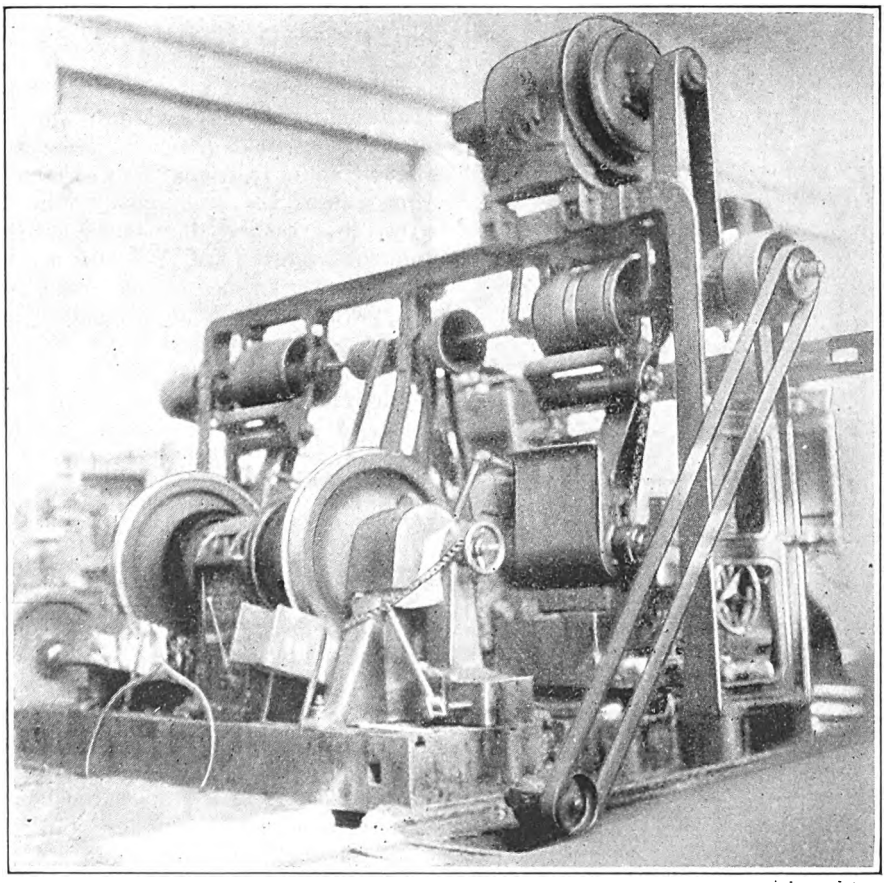
CANE-COVERED longitudinal seats in electric car service wear out first at the ends. In order to provide a protection for its longitudinal cane seats, the Erie Railways uses an aluminum casting. This fits closely over the end and extends down over the cane for a distance of about 2 in. The inside is beveled where it laps over the cane so as to provide a uniform surface. This has proved of great advantage in extending the life of longitudinal cane seats and in keeping them always neat in appearance.

A Million Mile Life for Wheels on Texas Electric

ORIGINAL wheels furnished with the cars purchased by the Texas Electric in 1913 were just replaced last year after twelve years of service. These cars have been running practically every day over the 271 miles of trackage except when held in for inspection and overhauling. On practically all steel wheels, at least 1,000,000 car-miles or more is obtained before the wheels are scrapped.

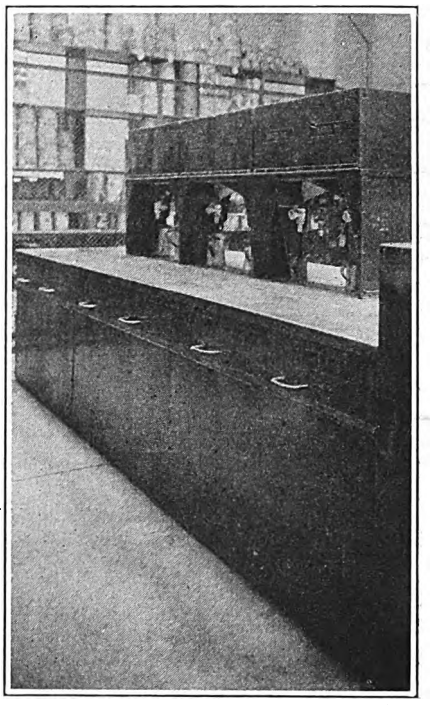
The method by which this long life is obtained is to build up flanges frequently by electrically welding high-carbon steel on the wearing side of the flanges and grinding both the tread and the flange to shape. Wheels are thus reconditioned every 30,000 to 40,000 miles, which on the Texas Electric Railway means every three to four months.

It has been found that the high-carbon steel used in the welding process has given an even greater life than the original steel flanges.



Grinding Equipment Used in the Shops of the Texas Electric Railway to Shape Treads and Flanges After Worn Flanges Are Built Up by Electrically Welding High-Carbon Steel on the Worn Flange Face. Very Light Cuts Are Made on the Tread

Easy Handling Features Paint Storage



Solvents for Paints Are Handled Quickly and Easily in the Convenient Paint Storage of the Department of Street Railways, Detroit, Mich.

IT IS particularly desirable to provide for easy handling of solvents in connection with any paint storage. The arrangement used by the Department of Street Railways, Detroit, Mich., has proved a great time saver and the arrangement is an attractive feature of this well-planned paint storage. The central part of the room is occupied by a large steel bench; mounted on top of this are six 5-gal. tanks for the storage of various solvents, such as enamel oils, boiled oil, raw oil, japan, substitute turpentine and turpentine. These tanks are kept well above the surface of the bench, so as to leave a space underneath of about 2 ft. A sheet steel framework is arranged as a support. Each tank is provided with a gate valve at the bottom, which is arranged for quick opening.

The sheet steel bench provides for storage of other paint materials, one side being arranged with bins, which can be drawn out to give access at the top. Dry materials are stored in these. The other side is provided with three shelves for the storage of liquid material in cans and also to serve for a storage of open paint. This paint storage department is entirely fireproof and paint cans which are used in the paint shop are returned to the paint storage room each night.

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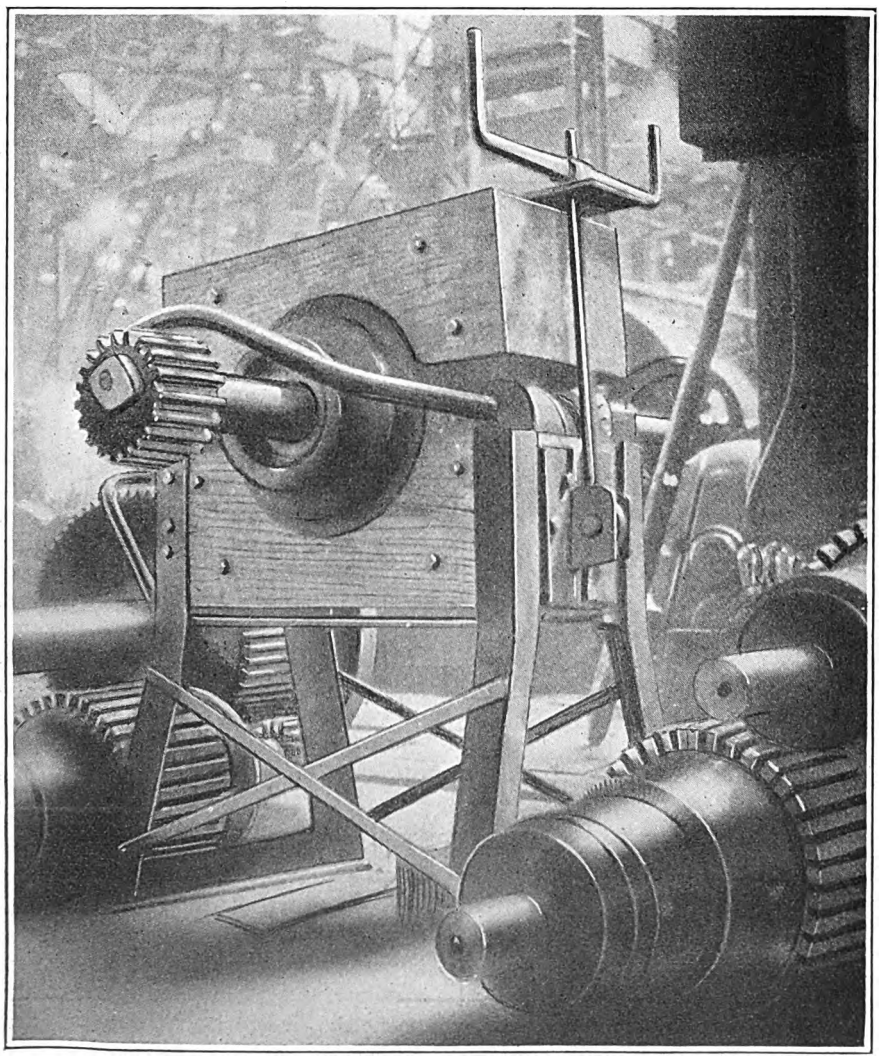
Block for Testing Armature Core Slippage

CONSIDERABLE difficulty had been experienced by the International Railway, Buffalo, N. Y., with open circuits in motor armatures. In spite of frequent inspections the commutator leads would persist in breaking and it was determined that this condition was caused by a loosening of the armature cores, thus permitting the armature windings to slip and placing a severe strain upon the leads to the commutator segments. To detect these loosened cores a wood block clamp was designed to hold the armature firmly in place while the core was tested by means of a long bar used as a wrench.

After making a chalk mark across the core and end of the armature the wrench is engaged with the pinion on the armature shaft and a considerable turning torque is applied due to the ample leverage provided by the long pipe which serves as a handle for the wrench. If any slipping of the core within the armature occurs it may be detected by observation of the two sections of the white chalk line. Considerable facility in handling the motor armatures is obtained with this apparatus and practically any desired number may be tested in the course of a day. In the accompanying illustration the pipe handle of the wrench is not shown. The armatures are clamped in place by means of the hand screw shown at the top of the upper block.



Armature Testing Block Which Is in Frequent Use by the International Railway

Bonding by Zinc Coating Rail Ends and Joint Plates

A NEW method of bonding rails for the return circuit has been developed in Germany. Among the advantages claimed are low cost, good electrical conductivity and no permanent mechanical connection between the joint plates and the rails. In consequence, single rails can be removed easily and renewed. The process, which consists of applying a layer of zinc to the contact surfaces of the rails and point plates, is claimed to be equally suitable for exposed track and for track in pavement. An account of the method follows:

The ends of the rails are first cleaned by sand-blasting. This can be done before the rails are laid, or in place, by the use of a portable equipment. Immediately thereafter the cleaned surfaces are coated with a layer of metallic zinc. This has been accomplished by use of the Schoop process. In this process a small zinc wire is fed into a pistol-shaped tool, where it is melted in an oxyhydrogen or oxyacetylene flame. Concentric to the torch flame is an annular outlet for compressed air, which atomizes the molten zinc. The resulting powerful jet of liquid zinc may be deposited on any surface near by, and the minute zinc globules, it is claimed, imbed themselves therein. After the contact surfaces of the rails and joint plates are zinc coated in this way they are bolted up in the usual manner.

If a portable sand-blasting equipment is used, a considerable saving can be made by catching the sand used in the sand blasting, and using it over and over again. The portable set, as illustrated, comprises a motor, a compressor, the sand-blasting outfit, the Schoop spraying equipment and the gas tanks.

Electrical tests are said to show that the resistance of a joint made in this way is 25 per cent less than that of equal rail length and that as time passes the resistance tends to grow less rather than more. The following figures are given for a rail weighing 40 kg. per meter (or 80 lb. per yard). The copper bond mentioned, in English equivalents, would be of about 600,000-circ.mil cross section and 27.6 in. long.

Type of Bond	Resistance	Specific Resistance	Cost Ratio
1. 1 m. length of rail 40 kg.....	0.000064	1	.....
2. Copper bond 310 sq.mm., 700 mm. long.....	0.000061	0.953	14
3. Zinc treatment....	0.000049	0.765	6

According to this table, copper bonds of very considerable cross-section would have to be used to reduce the resistance of a rail joint to that of an equal length of solid rail. The resistance of a zinc-coated bond is shown as 23 per cent less and its cost less than one-half that of a copper-bonded joint. In addition the proponents of the zinc-coated joint

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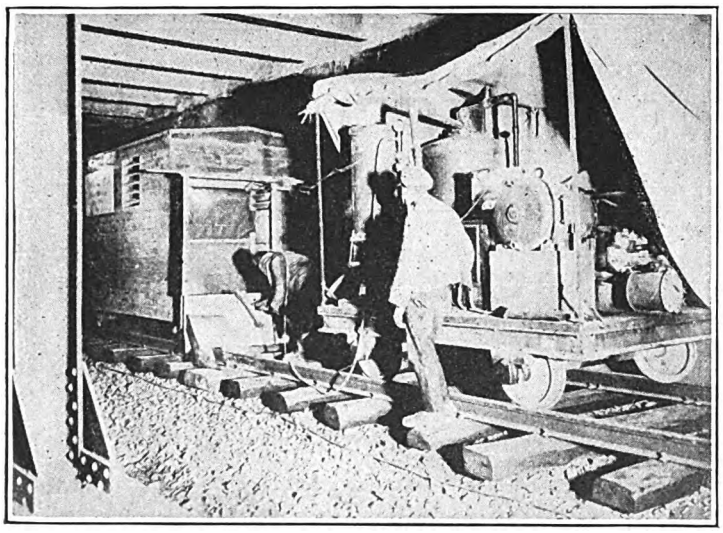
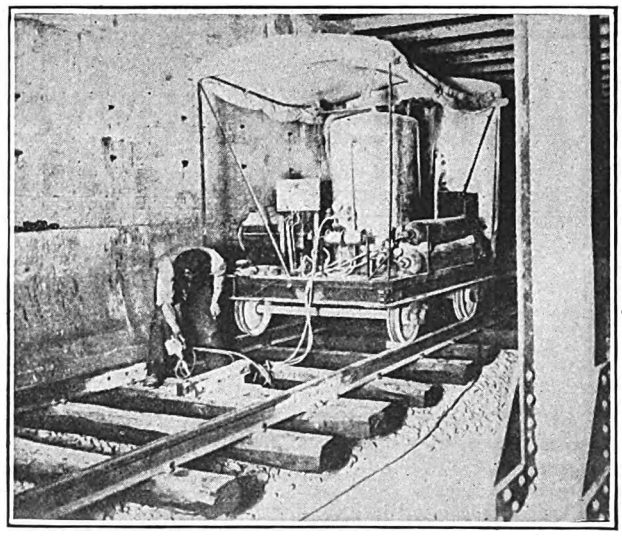




In This Method of Providing for the Return Circuit, the Ends of the Rails and the Inside Surfaces of the Joint Plates Are Sand Blasted. They Are Then Covered with a Thin Layer of Zinc, Which Is Deposited in a Spray

claim that it provides large contact surfaces, is electrically, mechanically and chemically indestructible, is easy to install even during traffic, and is theft-proof.

The German correspondent who supplied the information for this article did not state whether the method had been used up to the present time other than experimentally. No performance records are available.

New Equipment Available

Jack Principle Used for Pinion Puller

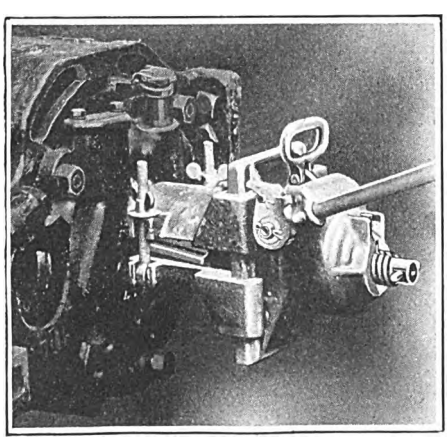
TO PROVIDE a uniform pull with a hand-operated device for removing pinions, the Duff Manufacturing Company, Pittsburgh, Pa., is marketing a new type of pinion puller. It was developed in collaboration with the engineers of the Westinghouse Electric & Manufacturing Company. Puller jaws extend down the back of the pinion to be removed and pressure is applied to the end of the armature shaft through a worm and screw.

The part of the puller which surrounds the pinion consists of two-part jaws held in position by bolts hinged with wing nuts. Particular attention has been devoted to make sure that the jaws line up truly. The jaws are relatively thin, but by employing high-grade material they are made exceedingly strong. The design provides jaws that will fit in a minimum space of ¼ in. between the motor housing and the side of the pinion. The jack part of the pinion puller slides into position in grooves in the front end of the jaws. The jaws and jack are thus distinct units. This makes the pinion puller simpler and makes it easier to attach and detach quickly.

With the pinion puller in position the operator turns up the screw by hand until it makes contact with the shaft of the armature. A few strokes of the jack lever bring the parts into extreme tension and additional strokes provide the pressure necessary for the pinion removal. After the pinion is loosened a few turns of the wing nuts which hold the jaws closed release the pinion so that it can be taken off quickly.

The housing and jaws are electric steel castings. The worm and screw are case hardened and ball bearings are used throughout. A particular feature is the provision made for bringing the end of the screw into contact with the pinion shaft quickly.

The puller complete weighs 50 lb. and is furnished with a 28-in. steel pinch-bar operating handle. Different size jaws are furnished to meet the requirements of varying sizes of pinions.



Puller in Position for Removing Pinions from Railway Motors

Direct-Current Relays for Feeder Circuits

DIRECT-CURRENT relays of a new line, filling a place not previously occupied in this field, have been developed by the Westinghouse Electric & Manufacturing Company, East Pittsburg, Pa. This new line includes resistance measuring, overcurrent, voltage, polarized and relays of other types. They resemble the Westinghouse induction-type alternating-current line.

The new relays operate on the magnetic-vane principle and are superior to previous direct-current relays in that their operating values of current or voltage and their time of operation may be determined with a greater degree of accuracy. They possess adjustable features so that the quantity operating them is adjustable, as well as their operating time. A new form of contact is used which is easily aligned, or removed in entirety for cleaning by the use of a screwdriver. The contacts are made of chemically pure silver.

The resistance-measuring relay, type XM, has been developed for automatic service-restoring circuit breakers and actually measures the resistance of the feeder. It recloses the breaker when indications are that the short circuit has cleared.

A particular feature of the XM relay is its time limit, which prevents the breaker from pumping rapidly when the trouble is of a recurring nature. This new line of relays is particularly useful in automatic substations.

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Association News & Discussions

America on Wheels

Samuel M. Vauclain Attributes Prosperity of This Country to Tireless Energy of Transportation People—Buses and Trucks Will Make More Business for Transportation Interests

ENORMOUS increases in the transportation business are predicted by Dr. Samuel M. Vauclain, president of the Baldwin Locomotive Works. His prophecy was made in an address at the opening session of the seventh annual meeting of Division V—Mechanical, of the American Railway Association, held at Atlantic City June 9-16. After sketching a number of developments in European locomotive practice, Dr. Vauclain continued:

"Here in our country, what do we see? We see the greatest prosperity that any country has ever enjoyed. We see a nation built upon a solid foundation, a foundation built by its own people. We are a very autocratic government here. It is autocratic because it is government of the people. The people make their own laws, and then the people compel themselves to obey those laws. There is an autocracy that is apparent wherever you go in the humblest walks of life, or in the highest planes, which we enjoy in our present civilization.

"This present prosperity is due to what? It is due to the tireless energy of the transportation people of this country that had made it possible for the people of a great nation of more than 100,000,000 population to communicate with each other, to have business relations with each other in an almost unbelievably short space of time.

"We are all as though we lived on one lot, notwithstanding that this lot is 3,000 miles wide. No one thinks of distance. No one thinks of difficulties so far as they relate to the transportation of goods or of people. This transportation of the railways has incited additional transportation facilities. The gasoline man has come along with his automobile.

AUTO AN AMERICAN PRODUCT

"The automobile is used, I might say, almost exclusively in the United States. Nearly 90 per cent of all the automobiles in the world are used in the United States. Almost every workman of any consequence has his flivver. And it is a God's blessing that he has this flivver, because his mind is on that and it is not on something that might give you or his employer trouble. One flivver in a man's family is enough to keep not only himself busy, but his entire family busy, in all the idle time that he may have. You must have something to keep the people employed, and therefore let it be a useful thing; let it be something that will change the radius of life in which he and his family live. The railways have changed the radius of life, so far as he can afford to pay railroad fares and Pullman acommodations, but the flivver has increased the radius of life of the ordinary individual because with a few quarts of gasoline he can go wherever he pleases.

"Automobile buses are the next thing that have come along. People have said, 'Why, these buses are going to drive the railroads out of business.' Gentlemen, don't worry about the automobile buses. It is going to drive you into business. In another ten years, the railroads will hardly know, unless they increase their facilities very much, how to handle this tremendous business that will be built up by the cross lines operated by automobile buses, automobile trucks, everything that can run anywhere without a rail, no matter what it costs.

"The American people don't care for the cost at all; what they want is to be on wheels. If it is not on car wheels or locomotive wheels, it can be bus wheels or automobile wheels.

"Now, it is for the young men in this convention, and the other men, members of it as long as I have been, to put their minds to work, not to find fault with those things which apparently are coming in to drive them out of business, but to embrace those things, enter into them, get the best out of them, apply them to the benefit of the principal business in which they are engaged, namely, railway transportation. We are not going to go out of the railroad business. We are not going to go out of the locomotive business. I expect that during the next 30 years of my administration of the Baldwin Locomotive Works we will have accomplished wonders and that the present locomotives, which we have on exhibit here today, and which represent, along with others exhibited by our friends who are in the locomotive business elsewhere, that which is the highest state of the art, will be a thing of the past before another ten years. And it will be you who will make it so. You will be the cause of it. This association will have much to do with it because these things will be discussed here.

"Don't worry about the future and do not have any regrets of the past. The man who thinks about what happened yesterday is not fit to tackle the problems of tomorrow. So what has passed, let it be passed. What have we today? What are we going to have tomorrow? And every day should bring to us something better. There should be something worth having. There should be something to keep a man busy and keep him at work.

"Let us go ahead and develop our own country. Let us develop our own facilities. Let us introduce the human idea into the work that we do. Let us take care of the man who has to work eight or ten hours every day or probably sixteen, the man at low wage. Let us do everything we can to increase his wage; make it higher. Give him more opportunity to enjoy life, so that he can provide greater privileges for his own family, but at the same time, by your own ingenuity, by the development of mechanical devices, reduce the cost of production so that we can all enjoy that which we have to deal with here in this great United States."

Central Accountants Meet in Chicago July 23-24

CHICAGO has been selected by the Central Electric Railway Accountants' Association for its next meeting, which will be held at the Drake Hotel on July 23 and 24. Following is the program.

Friday, July 23, 1926

Morning Session, Beginning 9 A.M.

Meeting of executive committee.

Address of welcome by C. E. Thompson, vice-president Chicago, North Shore & Milwaukee Railroad.

Problems in Bus Classification, by C. R. Mahan, auditor Chicago, North Shore & Milwaukee Railroad.

Discussion, led by F. A. Healy, auditor Indiana, Columbus & Eastern Traction Company, and A. E. Wafer, auditor Northern Ohio Power & Light Company.

Afternoon Session, Beginning 1:30 P.M.

Daily Reporting of Freight Accounts, by O. A. Small, auditor Chicago, South Bend & Northern Indiana Railway.

General discussion.

Discussion of items submitted in the agenda.

Saturday, July 24, 1926

Morning Session, Beginning 9 A.M.

Operation of the Budget System, by J. A. Seymour, assistant auditor Chicago Rapid Transit Company.

Discussion, led by L. A. Gould, auditor Chicago, Aurora & Elgin Railroad.

Reports of committees, general business and question box.

Americans Receive Membership in German Museum

ON THURSDAY, June 10, a luncheon was held at New York Chamber of Commerce Building in honor of Dr. Paul Rausch, retiring president of the Technical Museum in Munich, Germany. Dr. Rausch presented membership in the board of the museum to Judge Elbert H. Gary, Dr. Michael I. Pupin, E. W. Rice, Calvin Rice and John W. Lieb. Dr. George M. Kunz, president of the New York Museum of Industrial Arts, presided. Brief addresses were given by the recipients of this honor, who were all present.

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Budgetary Control for Electric Railways*

Detailed Estimates of Receipts and Expenditures for the Year Prepared in Advance Make Possible a Close Check on Operations and Result in Large Savings

By H. C. PATTEN
Comptroller Toronto Transportation Commission, Toronto, Canada

NEVER in the history of electric railways was there more need for efficient operation, close executive supervision and departmental co-operation. The object of this paper is primarily to point out and discuss one way or plan which has proved to be extremely effective in accomplishing these results. The meaning and purpose that is intended to be conveyed by the term "Budgetary Control" is the way in which financial estimates (that is forecasts of the operations) of any electric railway can have not only a "directing influence" on the course it will follow but also, and note the word, a "restraining influence." In other words, the budget keeps it on the right course, where it will save money, and not a roundabout, wasteful or inefficient way. And finally, these same financial estimates will, in the last analysis, govern the results as to profits or losses when the company arrives at the end of the year.

NECESSITY AND ADVANTAGE OF A BUDGET

The need for some such means of control seems almost self-evident when one considers the present difficulties of operating. The value of the budget system as a guiding and restraining influence in the executive control of an electric railway which is here described is not based on theories in any sense. It is the result solely of practical experience with its actual working. In this case, for purposes of simplicity, the details are confined to its operation in the Toronto Transportation Commission.

In a manufacturing concern the factory production, purchases and all of its activities, in fact, are almost wholly determined and guided by sales expectations. Unless the management of an electric railway has some similar means of guidance, such as is furnished by careful estimates of revenue, how can it intelligently determine the amounts which the various operating departments should expend? Over-production is just as likely to occur in the electric railway business as in a manufacturing company, unless revenue and expenditures are properly related.

Just one more word as to the benefits to be derived from executive control by a budget. They can hardly be emphasized too much. Many commercial and manufacturing companies use this system. The vice-president of the Bankers' Trust Company of New York, a Canadian, by the way, and one of the most prominent bankers in New York says: "A budget is not only a money maker but the greatest money saver ever discovered."

He recently stated that one concern which had lost $29,000,000 in three years of operation prior to 1924 succeeded in showing a surplus of $2,000,000 last year, simply by having a new president and installing a budget system.

The executive head of Armour & Company of Chicago, in speaking of the budget system recently installed in that company, stated that in one year it saved them $10,000,000 in operating costs.

In the Toronto Transportation Commission our operating expenses have been reduced from $8,468,841 in 1922 to $7,390,000 in 1925, and while credit for this cannot all be attributed to the budget system, because much of the savings are the result of installing very necessary modern facilities, there is no question that savings of some hundreds of thousands of dollars have been directly due to the close executive control of every department, which is only possible by control through a budget.

GENERAL PRINCIPLES OF BUDGETARY CONTROL

There are certain fundamental principles in regard to executive control by a budget which should be emphasized:

1. *Agreement with Balance Sheet.*—The budget must be complete and must tie in with the balance sheet of the company and the accounting records. It is a complete estimate of every item of revenue that the company receives and every item of operating expense and of expenditures for interest, sinking fund charges, depreciation, reserves of all kinds, dividends and surplus. If the budget does not set out such a complete statement in detail it loses practically all of its value as a guide to the executives, and as an incentive to the department to attain a definite objective for the year.

2. *Executive Control of Budget.*—The budget must be under the control of the highest executives in the company. No change should be made in the budget once it has been finally approved by the directors or executives, without authority from the same source.

3. *Responsibility of Department Heads.*—The budget must have the support of the department heads and in its details be prepared by the department heads, who must accept the responsibility for their estimates.

No department head is ever anxious to make estimates in detail of labor and material and overhead expense of the amount he proposes to spend during the year. Even if in the past he has been accustomed at the beginning of a year to figure out approximately his requirements, it is a very different thing if he knows that this estimate is to be submitted to the president, general manager, or board of directors and held over his head as a definite promise for the next twelve months.

The department head has been maintaining the power plant, the track, the rolling stock or the overhead system, as the case may be, and has been doing a good job, and doing it rather economically, he believes also. However, looking over his records he finds that, after all, his costs have not come down much for the last few years, and he begins to think that if the president is going to see his estimate, compare it with last year, and watch it month by month, it would certainly reflect more credit on him personally if he could attain a lower expenditure than he has had in the past year or two. It is surprising, when such a start is made, how easy it is to find a few places where economy is possible and yet the standard of maintenance be not lowered at all.

Take the maintenance of way man. He will realize as soon as he starts to make an estimate that it is something he cannot trust to some clerk in his department to prepare for him. Neither will he be inclined to take his track superintendent's word for it, or his foreman's as to the condition of certain sections of track. He will find also that it is not very safe to sit in a comfortable warm office with a map of the system in front of him and put down in real money how much he proposes to spend on those sections. It makes him get out on the street and walk around quite a few miles, not simply drive in his car over some stretch of track and decide that the joints need renewing this year, and that there may be a broken rail or two to be replaced. He will stop a little longer at some intersections and listen to the noise the cars make in going over them. In short, he will know his job a good deal better when he gets through his estimate if he is the right man for the job.

The superintendent of rolling stock

*Abstract of a paper presented before the Canadian Electric Railway Association, Quebec, June 2-4, 1926.

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 21-25*—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.**

***June 21-25*—American Institute Electrical Engineers, annual convention, The Greenbrier, White Sulphur Springs, W. Va.**

***June 25-26*—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.**

***June 28-July 2*—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.**

***July 8-10*—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.**

***July 23-24*—Central Electric Railway Accountants' Association, meeting, Drake Hotel, Chicago, Ill.**

***August 12-13*—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.**

***Oct. 4-8*—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.**

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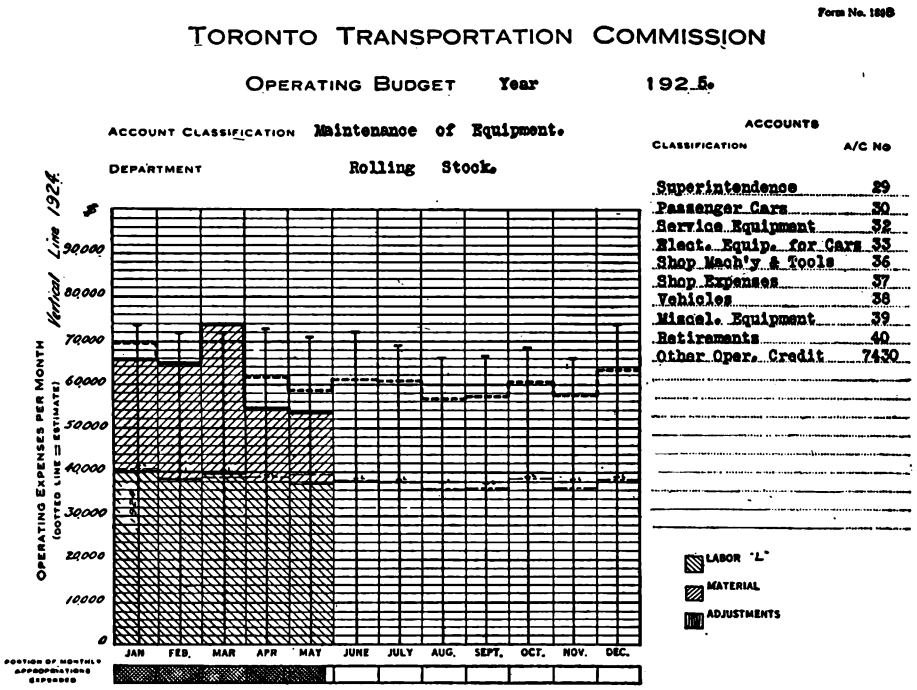
will not be anxious to put down on paper his exact costs for maintenance of the cars. Things in his shops have been going along about the same for a good many years. When he really thinks about it, has he kept up to date on all the latest money-saving devices? How about the cost of painting cars? He remembers at the last convention he investigated someting about that new system of spraying which would save so much money! And his men are still working with brushes just as they did 30 years before. He must get his estimate down. Hadn't he better do something right away? loose leaf ledgers will not only save a lot of money but enable him to get out the monthly statements for the directors' meetings several days earlier. So he too begins to do some intensive thinking, and before he is through he also becomes an enthusiastic convert to the budget idea.

In this connection it might be pointed out also that the budget system is one of the most effective means of developing a loyal and efficient staff that could be devised. It points out the weak spots in the organization, it is true, but on the other hand it has the advantage of bringing to the personal notice of the



Form No. 1868

TORONTO TRANSPORTATION COMMISSION

OPERATING BUDGET Year 192 5.

ACCOUNT CLASSIFICATION Maintenance of Equipment.

DEPARTMENT Rolling Stock.

ACCOUNTS CLASSIFICATION	A/C No
Superintendence	29
Passenger Cars	30
Service Equipment	32
Elect. Equip. for Cars	33
Shop Mach'y & Tools	36
Shop Expenses	37
Vehicles	38
Miscel. Equipment	39
Retirements	40
Other Oper. Credit	7430

MONTH	EXPENDITURES REPORTED MONTHLY	EXPENDITURES REPORTED TOTAL TO DATE	EXPENDITURES REPORTED CENTS PER C. M.	ESTIMATED EXPENDITURES MONTHLY	ESTIMATED EXPENDITURES TOTAL TO DATE
JANUARY	65,892.76	65,892.76	2.82	69,800.00	69,800.00
FEBRUARY	64,986.25	130,879.01	3.02	64,200.00	134,000.00
MARCH	73,904.12	204,783.13	3.16	69,980.00	203,980.00
APRIL	54,486.27	259,269.40	2.89	61,530.00	265,510.00
MAY	53,591.43	312,860.83	2.94	58,540.00	324,050.00
JUNE				60,703.00	384,753.00
JULY				60,490.00	445,243.00
AUGUST				56,306.00	501,549.00
SEPTEMBER				57,209.00	558,758.00
OCTOBER				60,380.00	619,138.00
NOVEMBER				57,494.00	676,632.00
DECEMBER				63,208.00	739,840.00
				TOTAL CENTS PER CAR MILE	2.99

REMARKS

This One Form Is Used for all Budget Estimates of the T. T. C.

Then when he thinks of it, there have been a number of new machines invented in the last few years, all of which means a saving of labor. Possibly he should install some new equipment. Perhaps the lighting or ventilation of his shops is very poor. With modern, efficient facilities it is surprising what large savings in maintenance of cars can be effected.

Even the accounting department chief will be a little averse to making an estimate of the salaries and supplies for his department. Those old ledgers cost a good deal of money and keep quite a staff occupied, and there have been several representatives of office system concerns in to call on him lately to explain how machine posting and

executives the abilities of men who possibly would never be discovered in any other way.

4. *Continuous Supervision of Budget.*—The budget must be kept up to date. The actual compilation of the departmental estimates should be done by the comptroller, or some one in close touch both with the executive and financial work of the company. Having been balanced and approved, it must be continually watched and comparisons made. It is of course difficult to get close comparisons of actual expenses with the estimates, except from monthly figures. Revenue, however, can be watched from day to day.

In order to keep the budget up to date in the Toronto Transportation Commission, the actual work requires about one-half the time of a graduate engineer with some accounting experience and about the full time of one clerk. To install a budget system does not have the effect of adding more clerks to the staff. There is just the opposite result. It eliminates a good many who spend their time preparing statistics and tables, cost analyses and routine reports.

5. *Use of Budget as a Standard of Efficiency.*—The advantage of the budget is that it sets up a standard for the department to work to. For example, the rolling stock department, which has been maintaining the cars at an average of 4 cents per car-mile, will decide that this year will do it for 3 cents. If the department head is enthusiastic himself, he will inspire the master mechanic and the foremen all through the shops with this ideal.

To get the full benefits from the budget system requires co-operation. It is not just a one-man job. The comptroller does not accomplish everything by merely installing the system, although the mere existence of a budget has an important moral effect. The important point is that it forces every department to operate according to a predetermined standard, within predetermined limits, or else exposes that department to the necessity of explanations which are sometimes difficult to make once the budget is in effect.

Practical Working of Budget

With the foregoing principles in mind, the budget system of controlling expenditures was started about three years ago in the Toronto Transportation Commission. Its results have been extremely satisfactory. While many of the difficulties which have been referred to in first undertaking the plan were encountered, it is now working very smoothly and almost automatically.

The budget is an estimate of the financial operations of the commission for a year's period in advance. In its complete form it is a combination of a series of estimates. These include estimates of (a) income, (b) operating expenses, (c) fixed charges. From these three groups it is possible, of course, to strike a balance and determine the probable surplus or deficit for the year, provided that every item of income and expenditure has been included in the estimates.

The estimates of income from all sources are made by the comptroller, as in this commission the comptroller's office is the department in which all financial and statistical reports are concentrated. In order to estimate passenger revenue, it is essential first to estimate the revenue passengers for the year. Admittedly this is not an easy task. It involves knowing considerably more than the total revenue passengers of the year before or even of the trend of traffic for a number of years. The comptroller has to take into account not only general statistics and charts, but also he has to make a careful study of local conditions. He has to know the trade statistics for Toronto, the government employment indices, the bank clearings, building construction and suburban development that may affect traffic, the increases in the number of automobile registrations

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from year to year; in short, he makes as complete an analysis as any commercial organization would do in estimating on its sales and factory production.

It is needless to say that this one item of passenger revenue is very important and is worth spending some time on, as even a small percentage error means many tens of thousands of dollars when estimating on numbers of passengers which total 180,000,000 per year.

Properly taking the factors into account the estimate is not a guess, but a carefully analyzed judgment of definite facts. The actual results in this commission, in any event, have been far closer than the usual allowance that an engineer would make in preparing his estimates. For example, the estimate of revenue passengers for 1925 was 179,500,000 and the number of passengers actually carried was 180,779,925, a difference of but 0.71 per cent. In individual months there were differences slightly higher than this, but some of these were plus and some minus, so that the net result for the year balanced out.

As another example, the estimate of car-miles for 1925 was 25,078,000 and we actually operated 25,247,058 car-miles. This difference is only 0.67 per cent. It was also estimated that the railway operating expenses (not including motor coach expenses) for the same year would be $7,511,539. The actual costs were $7,350,843, which is 2.14 per cent less than the estimates.

As a matter of fact it is far easier to estimate on the transportation business than any commercial business. It is not at all unusual to have fluctuations due to trade depression of 30 per cent or even 50 per cent in a year's time in some factories. In spite of all our troubles in the electric railway industry, there is a very reassuring steadiness to it.

The other items of revenue from transportation and of non-operating revenue are also estimated by the comptroller. These are usually capable of quite definite computation.

Before the different departments can submit an intelligent estimate as to their expenditures, certain fundamental matters of operation must be definitely settled by the management. The most important of these relates to the car-miles to be operated.

All of the largest spending departments require data on this matter before their estimates can be prepared. Consequently it is essential first of all to prepare as accurate an estimate as possible of the car-miles to be operated in the coming year. This is prepared in its details by the traffic department. A knowledge of proposed extensions is required, studies of the density are made, and every known fact that can have any effect on traffic is considered. The estimates are always divided to show separately the mileage of two-man cars, one-man cars, trailers, etc.

With the figures of expected car-miles to be operated for the year in their hands, the departments are then able to prepare and submit their estimates, not only in dollars, but also to reduce them to a cost in cents per car-mile.

In estimating on the operating expenses, it is extremely important not to overlook any. The responsibility for this falls on the comptroller's department. There are quite a number of general expenses for which no particular department assumes responsibility, and which usually have to be carefully analyzed and estimated by the comptroller. In the aggregate this class of expenses is not large and errors in estimating do not have a serious effect. It is also always safe to allow something for contingencies.

The estimates which have to be made of the fixed charges also are prepared by the comptroller. These include all items of deductions from net income, such as interest and sinking fund charges on the debenture debt, reserves for replacements (which are part of the operating expense accounts according to the I.C.C. classification), reserves for contingencies, taxes, etc. Practically all of these are capable of definite calculation and there is usually no special difficulty in estimating them. Here again it is important to make sure that nothing is overlooked.

Balancing the Budget

The procedure in the Transportation Commission is to submit all of the estimates to the comptroller, who then prepares a final summary of revenue, operating expenses, deductions from net income and surplus.

The first year the budget system was put into effect it appeared at first as though there would be a deficit of three or four hundred thousand dollars. It took a number of conferences before the budget would actually balance and the necessities for economies in operation were brought home to every one. In every case we have been able to balance the budget at the beginning of the year to a satisfactory point, with the co-operation of the operating departments, and not by any arbitrary cuts by the management.

The completed statement for the year is then prepared, setting out the income, the various groups of operating expenses, the deductions from income and the surplus. This statement is then officially approved and becomes the standard which must be measured up to, the compass by which the management can judge accurately the financial course which the system is following.

As has already been pointed out, it is fundamental that the budget be kept up to date if any real value is to be obtained from its operation. For the purpose of budget records we use in the Transportation Commission only one standard form. A copy of the form is shown herewith. It is standard letter size. It was designed to show the results both graphically and in actual figures. Experience seems to indicate that both ways are desirable. The chart, moreover, makes it possible to show the comparative figures of previous years when such are desirable, without making the records too complicated.

At the beginning of the year the approved estimates by months and cumulative for each department are typed in the two lower right-hand columns on the form. At the same time these monthly records are plotted on the chart. For comparison, the vertical lines with the flat cross lines at the top represent the monthly expenditures of the previous year. At the right-hand side of the form are the names of the various accounts for which the department is responsible.

The process of keeping the records up to date is obvious. As soon as the actual expenditures are available from the accounting department, which is usually about ten to fifteen days after the end of the month, they are entered in the columns marked "Expenditures Reported," and at the same time plotted on the chart.

By a different system of cross-hatching, the chart indicates the relative amounts of labor cost and material cost. The small spaces just below the main chart, which are marked "Portion of monthly appropriation expended," are used as a sort of thermometer scale to indicate, at a glance, whether the department is below or exceeding its estimates for the year to date. After the entries of actual cost have been made each month, a blueprint of the master sheet is immediately taken off and copies sent to the departments interested.

By merely crossing out the word "expenditures," we use the same form to compare estimates of revenue with the actual income, or we use it to compare traffic records of passengers or car-miles.

Under ordinary circumstances, each department is responsible for certain definite operating accounts in our standard classification. No other department can use them without proper authority. It has had the good result that items of expense which previously had been nobody's business apparently are now allocated to a definite department.

As a final step in the budget records, the comptroller prepares, every quarter, a summary of the exact position of the Transportation Commission with respect to the gross income, expenditures, fixed charges and surplus, as compared with the original budget figures. This quarterly statement serves additionally to keep the commissioners and general manager closely informed of the course of the business.

Results Obtained from Budgetary Control

It may be desirable to sum up briefly the benefits which can be obtained from budgetary control:

1. There is no more effective way of saving money, and saving it, moreover, in those expenditures which are so important to control, namely, operating expenses.

2. It is the simplest method possible by which an executive can obtain direct control and supervision and exact knowledge of the financial position.

3. It sets up standards of efficiency and develops co-operation and loyalty within a department.

4. It develops co-operation between departments.

5. It develops the right type of executive to the advantage of the company and himself, and at the same time indicates the points in the organization which need strengthening.

6. It develops, and provides in a very accessible form, extremely valu-

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able cost data which can be used as a guide to future operations and is not merely of historical interest.

7. It forces a company to make an annual review of every item of expenditure, with the inevitable result that unnecessary expenditures will be eliminated.

Dipping and Baking Are of Great Value in Severe Service*

By D. Chenard
Master Mechanic Levis County Railway, Levis, Canada

DIPPING of armatures is an excellent and worth while practice. The dipping seals up all the cracks and other weak spots which may have developed in the installation of the coils due to vibration, expansion, and contraction. To obtain satisfactory results the process must be done properly. Under our operating conditions where we have seven months of snow, frost and water and extreme variations in temperatures, we have conditions to meet which few companies have. The chance of a breakdown in the insulation of the motor is considerably greater under our conditions, and anything which will help the insulation to stand up under these conditions means a lot to us.

We started dipping armatures in 1923 and excluding bearing troubles our records show an average mileage per failure of 31,915.7 car-miles or 63,831.4 motor-miles for that year. We obtained little benefit from the dipping of the armatures in 1923 as it took more than a year before we had them all dipped and the results did not begin to show up until 1924. The total car mileage per failure per armature including bearings, etc., for the year 1923 was 25,391 car-miles or 51,862 motor-miles. In the year 1924, when the results of dipping armatures began to show, the car-miles per failure increased to 50,857.75 or 101,715.5 motor-miles per armature failure due to electrical trouble. There were no bearing troubles that year, so that these figures cover the total armature failures from all causes.

In 1923 we had sixteen pull-ins for armature failures of all kinds. In 1924 we had eight pull-ins for all kinds, or 50 per cent decrease in pull-ins. There were no pull-ins for bearing troubles. For the year 1925 our records show even a better improvement. We obtained 66,535 car-miles or 133,070 motor-miles per electrical failure, which is a 30 per cent increase in the mileage over the year 1924 and 154 per cent over 1923. Under our winter conditions we sometimes have snow drifting into the motors, which causes dampness, and I have personally examined cars which have been standing at the terminal for a short space of time with the commutators of the motors quite wet. Sometimes we have found the carbon brushes actually frozen in the brush-holders. This will give some idea of the severe conditions we have to face.

With our method of treating, the armatures are first placed in our electrically heated oven at a temperature of 185 deg. F. for about three hours. The armatures are then taken and compressed air is used to blow out all dirt and dust. It is then tested at 550 volts. If this test is successful 1,100 volts is then applied. If this pressure is withstood we double the dose and apply 2,200 volts. The armature is then placed back in the oven over night at the same temperature as before and it is then taken out and dipped in a special round vertical tank using black plastic varnish, and it is left in the tank for an hour till the varnish has thoroughly penetrated into all the cracks and weak places. The varnish is heated up considerably by the heat from the armature and thins off accordingly so that it penetrates better. The armature is then lifted out of the tank and is allowed to drain off for five hours, after which it is placed back in the oven to dry out. It is very important that this last phase of the operation be done properly for if the varnish is not hardened properly it is thrown off by the armature when in operation under heated conditions. We, therefore, leave the armature in the oven at full temperature for approximately 72 hours.

It may be argued by some that dipping of armatures tends to make the coils brittle so that in case of repairs the whole armature has to be stripped and rewound. The use of plastic varnish reduces this danger considerably and it is our experience that with the modern motors where the windings are tight it is not possible to make a satisfactory repair which will stand up to operating conditions whether the armature is dipped or not. On the old type of motor where the coils are loose in the slots it is, of course, possible to repair them and make a fairly good job without rewinding even when they are dipped, which process we carry out with the old type. The main question is to keep the cars on the road and avoid all breakdowns or pull-ins. A weak armature due to repairs will cost more than if it was rewound properly. We figure that every car pulled in off the road costs us about $8.75 each without counting the loss of the car itself from off the road. This amount would be more if we had to send an extra car out to haul the other one in.

*Abstract of discussion before the Canadian Electric Railway Association, Quebec, June 2-4, 1926.

ARMATURE FAILURE RECORD SINCE DIPPING AND BAKING WAS STARTED

	Car-Miles	Motor-Miles	Number of Bearings Changed	Number of Armatures Changed
1923	414,905	829,810	3	16
1924	406,862	813,724	1	8
1925	399,214	798,428	10	6
Total	1,220,981	2,441,962	14	30

Three year average motor-miles per armature changed	81,330
Three year average motor-miles per bearing changed	174,600
Three year average car-miles per armature changed	40,666
Three year average car-miles per bearing changed	87,300

Canadian Association Appoints Auditor

IN THE list of officers of the Canadian Electric Railway Association published in the June 12 issue of this paper the name of the auditor was omitted, as it was not included in the official list. The appointment for auditor for the ensuing year is L. Tait, manager and secretary-treasurer London Street Railway, London, Ont.

Midwest Association Announces Program

SPECIAL cars will be run from Kansas City to Denver for the electric railway and supply men attending the third annual convention of the Midwest Electric Railway Association to be held in Denver July 8-10. Arrangement has been made with the Burlington line to run the special cars on the train leaving Kansas City at 10:30 a.m. on July 7, and due to arrive in Denver the following day at 7:30 a.m. Entertainment for the ladies will be provided en route.

Those desiring accommodations on the special cars should notify Secretary J. A. Weimer or D. L. Fennell of the executive committee at the association's headquarters, 530 Railway Exchange, Kansas City, Mo.

Entertainment features include visits to Lakeside Park on Thursday evening, to Elitch's Garden on Friday evening and to Lookout Mountain on Saturday afternoon. The annual banquet will be held at the last-named place Saturday evening. Frank R. Coates, president American Electric Railway Association, will be the principal speaker.

Thursday, July 8, Beginning 9:30 A.M.
Registration and address of welcome.

1:30 P.M.
"Electric Car of the Future," by J. M. Bosenbury, superintendent of motive power and equipment, Illinois Traction, Inc.
"Modern Methods of Equipment," by R. W. Bailey, superintendent of power and equipment, Kansas City Railways.

Friday, July 9, Beginning 9:30 A.M.
"The Interurban Bus," by B. W. Arnold, manager motor coach department, Chicago, North Shore & Milwaukee Railroad.
"The Human Element in the Industry," by F. G. Buffe, general manager for the receivers Kansas City Railways.

1:30 P.M.
"Mass Transportation and the Automobile," by Ernest Stenger, president Denver Tramway.
"Fares, Passes and Transfers," by B. W. Frauenthal, general traffic agent United Railways of St. Louis.

Saturday, July 10, Beginning 9:30 A.M.
"Modern City Track," by Nelson R. Love, chief engineer Denver Tramway.
Election of officers and business session.

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American Association News

Entertainment

AT THE meeting of the entertainment committee held in Atlantic City on May 21, several sub-committees were appointed to prepare data on many features for the entertainment of delegates and ladies who will attend the Cleveland convention in October. No definite plans have been announced.

Those attending the meeting were Chairman S. J. Cotsworth, Harry Brown, Fred Bullock representing Col. J. H. Alexander, Fred C. J. Dell, Harry Doyle, T. O. Kennedy, C. S. McCalla, E. P. Waller, J. W. Welsh, Roy Hauer, C. S. McCreery and J. B. Stewart.

Rapid Transit

FUNDAMENTAL data collected and compiled by the rapid transit committee's engineer, E. J. McIlraith, in accordance with an outline prepared earlier in the year, were discussed in a meeting of the committee held at association headquarters on June 10.

It is the plan of the committee to set up in its report such information and data as will serve as a guide in the determination of the rapid transit policy of any community. There was some question of the advisability of submitting this year any definite recommendations regarding the proper or equitable basis for financing construction as between the car rider, the community at large, and benefited property. It was the opinion of some members of the committee that a definite recommendation on this subject would be premature at this time and that the purpose of the report this year should be merely the submission of the information compiled.

Those present at the meeting included G. A. Richardson, chairman, Daniel L. Turner, W. S. Menden, James Walker, Edward Dana, S. E. Emmons, F. H. Shepard and E. J. McIlraith.

Power Generation and Conversion

MATERIAL to go into the final report of the power generation and conversion committee was given the finishing touches at the committee's meeting held at association headquarters, New York, June 1 and 2. Members of the committee present included L. D. Bale, chairman; C. A. Butcher, H. W. Codding, F. W. Peters, L. J. Turley, Mr. Pennington representing C. E. Bennett, and Mr. Vandeventer representing G. W. Saathoff.

The sub-committee on review of existing Manual sections reported that the prime movers committee of the N.E.L.A. had done little in connection with fuel specifications this year, and as action by the power generation and conversion committee depends upon N.E.L.A. recommendations there is little to report. In connection with high-tensile strength bolts for use on superheated steam pipe lines, a ballot is being taken by the American Society for Testing Materials on the adoption of tentative specifications submitted last year and final reports will depend upon this adoption.

A very comprehensive report on existing practices in design and operation of automatic substations, including the subject of remote and supervisory control, was submitted and approved with a few minor changes. There was considerable discussion in regard to a report on the application, characteristics and present status of the mercury arc power rectifier for electric railway service. The committee considers this a very important subject, and a special session of the sub-committee working on this will be called for the purpose of revising the report.

The sub-committee on the ventilation and reduction of noise in automatic substations reported the completion of ventilating tests on a naturally ventilated plant in Baltimore and mechanically ventilated plants in St. Louis, Los Angeles and one of the stations of the Public Service Production Company of New Jersey. Mr. Keller of the Carnegie Institute of Technology, Pittsburgh, Pa., was requested to prepare a discussion for inclusion in the final report on the subject of characteristics of ventilators under various wind pressures, taking into consideration the effect upon discharge of the ventilator due to the accumulative effect of wind velocity and temperature.

Heavy Electric Traction

REPORTS of sub-committees were received at the meeting of the committee on heavy electric traction of the Engineering Association, held in the sun parlor of the Hotel Strand, Atlantic City, on June 11. Members present were H. F. Brown, chairman; Morris Buck, secretary; A. H. Armstrong, H. W. Cope, W. A. Burnham representing A. H. Daus, J. H. Davis, E. P. Chase representing J. V. B. Duer, J. T. Hamilton, J. O. Madison, M. W. Manz and L. S. Wells.

A very complete report has been prepared by the sub-committee on track and third-rail bonds. Information has been collected on the practice of a number of roads. A standard basis for comparison of bond resistance has also been developed and presented in a series of charts and tables.

It was decided to proceed with the publication of the bibliography of heavy electric traction subject to the approval of the association. Further information has been collected and compiled on the subject of articulated trains. This information supplements the complete report of the 1924 committee. Other subjects considered include material in the Engineering Manual, branch-line electrification and self-propelled cars, and data on locomotives and multiple-unit cars.

Power Transmission and Distribution

A BUSY two-day session, June 7 and 8, constituted the final meeting of the power transmission and distribution committee. This was held at the association's headquarters, New York. The following members were present: Charles H. Jones, chairman; J. Walter Allen, W. H. Bassett, M. W. Cooke, J. C. Damon, James H. Drew, C. L. Hancock, C. J. Hixson, A. J. Klatte, F. McVittie, H. S. Murphy, J. F. Neild, W. J. Quinn, W. Schaake and A. Schlesinger.

The sessions of June 7 were devoted exclusively to meetings of the various sub-committees, when reports were put into shape for final presentation. The general meeting occurred June 8. In connection with the review of existing Manual sections it was decided that the name Western white cedar be replaced by the name Western red cedar, to bring the terminology in line with the practice of the American Engineering Standards Committee. Other paragraphs will also be written to conform. Several changes were decided upon which will be made in the specifications for rubber insulated wire and cable for power distribution purposes, the specification and form of contract for electrical conduit construction and specifications relating to poles.

The sub-committee on catenary material specifications found much of the present material now common with specifications for direct suspension material. Recommendation was made that a separate heading be added to take care of this for catenary construction and that the material be left under direct suspension specifications.

In going over specifications for trolley wire wear, the committee found some changes desirable in order to make the association specifications conform with those for the American Society for Testing Materials.

Considerable interest was manifested in the discussion of the report on radio interference. Various sources of interference from electric railways were discussed and analyzed. Details of tests and experiments will be included in the final report, together with experiments which have been made in some other countries.

In considering revision of specifications for 600-volt direct suspension trolley overhead construction, the committee found that the American Engineering Standards Committee is working on similar specifications, and it was felt that the matter should be left as it is for the present and developments watched carefully.

A draft of the main points to be considered in an agreement for the joint use of poles was submitted, and it was decided that the sections headed "Practices of Joint Use" should be revised and rewritten.

New subjects suggested for consideration by next year's committee included clearances between trolley collecting devices and trolley wire fittings, comparison of economics of operation of trolley systems, and specifications for caps and cones.

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The News of the Industry

Senator Urges Terminable Permits

Illinois Legislator Recommends Relief from Tax Burdens Be Extended to Electric Railway

State Senator Richard J. Barr, Joliet, declared in a newspaper interview on June 11 that the terminable permit idea appeals to most reasoning persons who have given adequate study to the question. Senator Barr, who is chairman of the Illinois Legislature's joint commission on terminable permits, stated that he was not speaking for the commission but merely giving his own personal impressions.

He could think of no valid reason why a utility should not be permitted to give the service for which it is organized. As he sees it, most students of the matter are of the opinion that short-term franchises hinder, and sometimes prevent, a utility from financing itself upon any proper basis. It follows that without proper financing a utility cannot give adequate and fair service. He said:

> There were excellent reasons for a short-term franchise. When it was fully justified, there was no attempt at regulation. The city, in granting a franchise, said that there must be a day of reckoning, a squaring of accounts. Accordingly, it fixed a short term so that there could be a readjustment with expiration of the franchise. But that was before the days of regulation. Now it is different.
>
> No utility should have a franchise for a month beyond its good behavior. A terminable permit seeks to grant a right to operate only during good behavior, so long as the utility gives good service at a reasonable charge. When a utility is unfair, when it charges too much and gives too little, its right to operate should be terminated.

In questioning the soundness of provisions in the traction ordinance now pending in Chicago, which would compel the surface lines to pay more than 5 per cent of gross receipts as city compensation, pave between the tracks and clean and sprinkle its part of the streets, Senator Barr declared:

> The car rider should pay only the cost of his transportation. Why put a special tax on him for the benefit of the government? There was a time when compensation was rightfully exacted. That was in the days of horse cars when the horses wore out part of the pavement. But electric cars today do not wear out pavements.
>
> A large city needs rapid transit, surface lines and buses. They should supplement each other, not compete with each other. Only by operation in harmony can they supply the best service, and that really is the objective of all of the discussion of transportation, or should be. The fare payer should get it at a reasonable fare.

In referring to the proposal to build subways by special assessment, he added:

> It is unfair that the Chicago car riders should be compelled to pay $45,000,000, the amount at which the fund now stands, with which to build a subway. It is my notion that subways should come from general and special taxation. That is the tendency, in part, in Paris, Rome, New York, Philadelphia and Boston. The car riders should not be penalized. They have some rights. They should not be imposed upon for the benefit of other residents.

New Cars Demonstrated to Richmond Residents

Residents of Richmond, Va., were permitted by the Virginia Electric & Power Company to ride free on May 31, when the company placed in service two of its new cars, part of the shipment of fifteen recently received for service on the Ginter Park-Fulton line. Specifications of them were published in the JOURNAL for May 29, page 953. Two of the cars were operated for demonstration purposes up and down Broad Street on May 31 between 9 a.m. and 4 p.m. A demonstrator was placed aboard each car to explain its new features to the passengers. The cars are scarlet in color, with a white roof and blue trimmings.

One-Man Cars in Downtown Milwaukee

Milwaukee's recently instituted six months experiment of one-man car service through the downtown district on the Walnut Street line seems to be meeting with success from the very outset, both from the standpoint of the public and the company. According to reports of the first four days of operation under the new service made by the traffic department of the Milwaukee Electric Railway & Light Company a total of 121,961 passengers were carried, as compared to 115,186 passengers counted during a four-day check made of two-man car service the week prior to the adoption of one-man service. No complaint on the part of the public has been made against the service. Only five accidents of a minor character were reported. These, however, were declared not to be attributable to the cars.

The Deadhead

As San Francisco Sees Itself

Buses Not Favored by Cleveland Suburbs

Protests against substitution of bus service for trolley lines have been registered in Lakewood, Cleveland Heights and Euclid, Ohio. The Lakewood Council, three to one, tabled the Cleveland Railway proposal of a 60-day trial of buses instead of the Clifton Boulevard trolley line. The added cost of bus service, especially for school children and persons riding within Lakewood limits, was the principal argument advanced. Joseph H. Alexander, vice-president, guaranteed five-minute service, a seat for every passenger and free transfers to proposed intersecting bus lines. Ten cents was the maximum bus fare, but there was a possibility of a reduction, he said.

The Cleveland Heights Council and Mayor Frank C. Cain do not favor any proposal to substitute buses for the Fairmount Boulevard line and asked that the railway extend the Fairmount line half a mile to Canterbury Road and the Euclid Heights line in Mayfield Road 1¾ miles to Warrensville Center Road.

Indictments of Strikers at Buffalo Dismissed

United States District Judge John R. Hazel has *nolle prossed* 28 federal grand jury indictments charging conspiracy and various other offenses in connection with the dynamiting of the Buffalo-Niagara Falls high-speed line of the International Railway, Buffalo, during the strike in 1922. Application for the dismissal of the indictments was made by Richard H. Templeton, United States attorney for the western district of New York. The court was told there was not sufficient evidence to warrant the government to continue the prosecution of the defendants. The charges in almost every case were conspiracy to interfere with interstate commerce.

Among the defendants dismissed by the court were Robert C. Lacey, former New York State Senator; John M. Parker, former president of the Buffalo branch of the Amalgamated; William B. Fitzgerald of Yonkers, national organizer and vice-president of the Amalgamated. Three men were convicted when the original indictments were returned. Each was sentenced to a year in prison and fines ranging from $2,000 to $5,000 were imposed. At the trial a year ago of other defendants all were acquitted.

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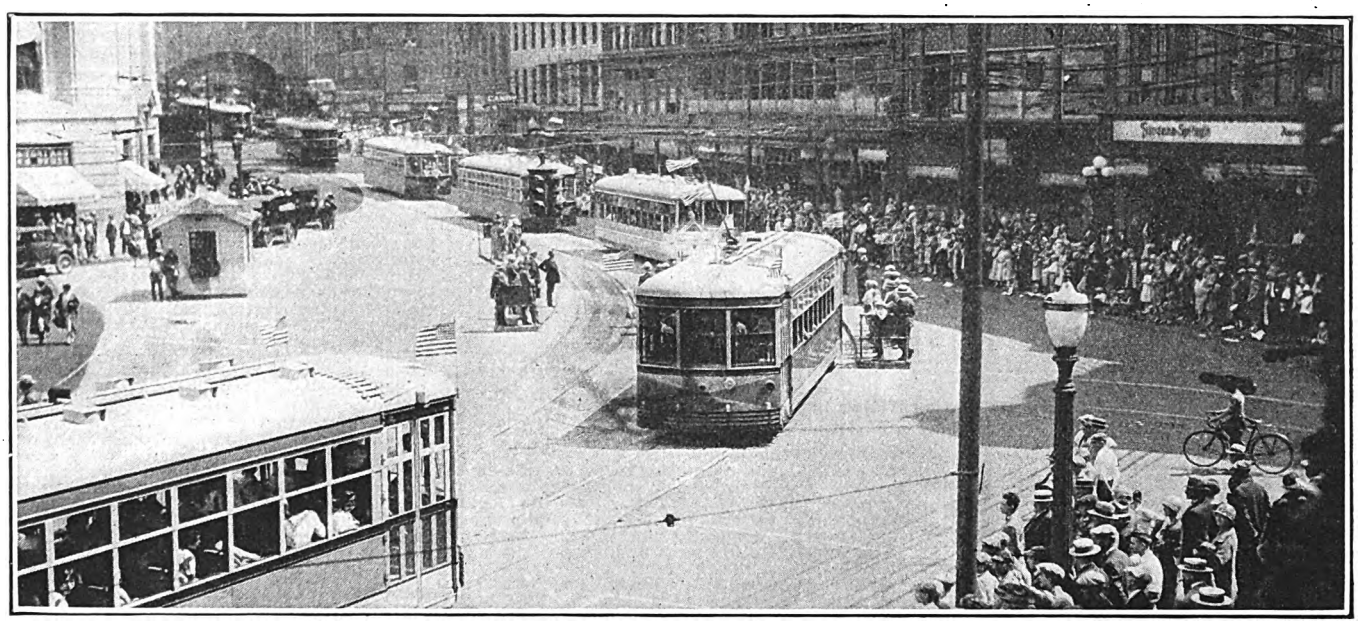
New Cars in Service in Grand Rapids

Twenty-seven Coaches, Bedecked with Flowers and Flags, Form Part of a Public Utility Parade and Service Demonstration That Was Impressive, Educational and Memorable



Part of Grand Rapids Parade of New Coaches Passing Through the Square

IN A TRIUMPHANT parade viewed by one of the largest crowds assembled there in recent years, the Grand Rapids Railway, Grand Rapids, Mich., demonstrated its 27 new electric rail coaches on Saturday, June 12. The event was made a holiday by Grand Rapids residents, who had patiently waited for the company to complete its tests of three types of modern improved coaches expected to set a new standard of equipment for the industry, and especially meet the needs of Grand Rapids patrons. Weather conditions were ideal—in sharp contrast to the cool, rainy days previous to the parade. Keyed up to a desire to see the new coaches, people jammed Monroe Avenue, the side streets and the residential district through which the coaches passed and applauded the attractive new vehicles. The day after the parade the new coaches were placed in regular service.

The parade started from the Hall Street carhouse. It was scheduled to move at 1 p.m., but the large number of photographers and newspaper men, making movies and "stills," delayed the start until nearly 2 o'clock. Traffic was virtually suspended on Division Avenue as the parade headed by motorcycle police rolled through that street and entered Monroe Avenue, swung around the Ottawa Avenue loop and really passed in review through the heart of the city.

All of the 27 new coaches were bedecked with flowers and flags. They were preceded by the first horse car operated in the city, an old 16-ft. type of 1880 car, a 1900 type of car and another of more recent design, all arranged in the order named. After these came the Minnesota, the St. Louis and the Ohio, all modern cars, offering a picture of street railway progress that was impressive, educational and memorable. Fifty city organizations—noonday luncheon clubs, women's clubs, improvement associations, schools, civic bodies, past and present city officials—were guests of the railway and rode in the new coaches. Six bands made the parade heard as well as seen.

Descendants of the pioneers for whom the coaches were named were the honor guests. Many of them, pleased with the honor paid their relatives, were accompanied by invited guests. Also included among the guests were staff correspondents of the ELECTRIC RAILWAY JOURNAL, *Railway Age*, the *Saturday Evening Post*, and Chicago and other Middle West newspapers.

After leaving the downtown district the parade proceeded out Cherry Street to Ramona Park, but returned to Monroe Avenue where it split. The coaches then made their maiden trips over the routes they will henceforth serve.

RAILWAY MANAGEMENT CONGRATULATED

City officials, citizens and visiting railway representatives congratulated L. J. DeLamarter, vice-president and general manager, for his company's and his own accomplishment in creating a new and ultra-modern type of electric rail vehicle to meet the competition of the private automobile by offering to the public more comfortable, luxurious city transportation. Thanks were also extended to him from all sides for dedicating the new coaches to the people of Grand Rapids. City officials predicted that Mr. DeLamarter's effort to give the citizens railway service unexcelled by any other city comparable to Grand Rapids in size would prove invaluable, if the demonstration of the performance of the cars and their unprecedented reception were any criterion. Many citizens who have not been in a street car for years rode in the new coaches during the parade and pledged themselves in future to reserve their autos for pleasure purposes.

An analysis of the reaction of the people to the new coaches during the first few days after their installation seems to indicate that the people are especially pleased with the low steps. The luxurious seats and comfortable cushions are coming in for favorable comment, and the lighting arrangement, which permit of reading in any corner of the car, is greatly appreciated. So far as men are concerned the smoking compartment is a decided hit with them. This is a clubby arrangement of seats in the rear for patrons who find pleasure in My Lady Nicotine.

The step-well received its first tryout on Sunday, the day the new coaches went into service. It rained that day, but patrons found the step-well permitted them to enter the coaches quickly and under shelter.

The semi-noiseless operation of the coaches is also appreciated by the merchants in Monroe Avenue. One of them said to the correspondent of the ELECTRIC RAILWAY JOURNAL on Monday that "it is now possible for me to converse with my customers without yelling at the top of my voice when the street cars go by that I may make myself heard, or without cupping my ears to hear what the customer says."

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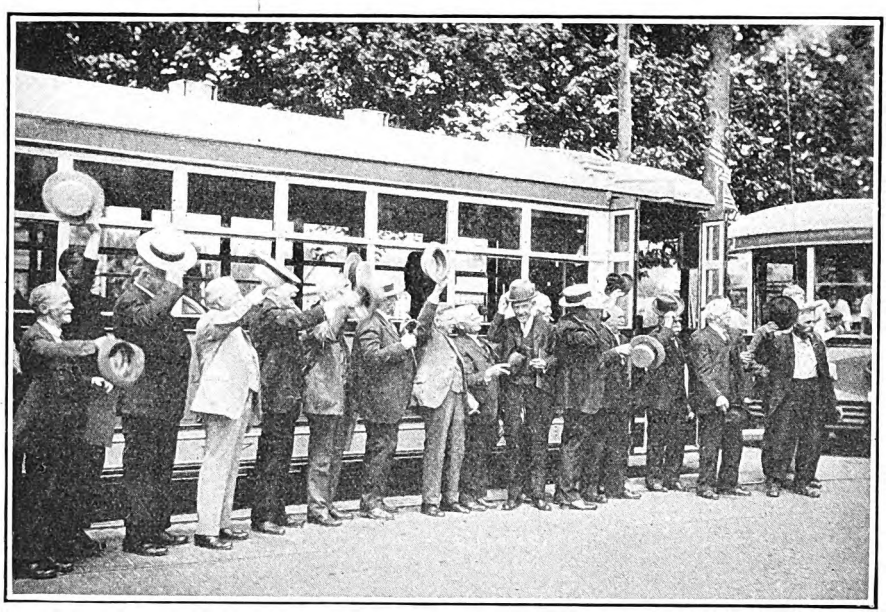

Old Friends of Daniel H. Waters Riding in Car Named After Him

Residents along the routes on which the new coaches are operating also comment on the reduction of noises.

Easy exits from the coaches is another feature that is winning popular favor with Grand Rapids patrons through the new automatic rear-door treadle. Children have discovered the "slick way" they can alight from the car and are rapidly showing their parents the "new trick." Operators report that the treadles are helping them to handle the crowds on the downtown loading platforms during the rush hours.

In an interview in the Grand Rapids *Herald*, Mayor Elvin Swarthout in commenting on the new coaches said:

> Grand Rapids may well be proud of the enviable position which it holds in pioneering the development of transportation beyond the stage which had been accepted as standard. The new coaches are a revelation of convenience and comfort, and great credit is due the officials of the company for the enterprise and zeal expended with such splendid results.

City Commissioners George F. Gruenbauer, John D. Karel and others declared the new coaches were a tribute to the vision of the management.

Gerald J. Wagner, the city's consulting engineer, who has followed closely the progress of the company since the granting of the 1918 franchise, expressed satisfaction at the happy climax of co-operation between the City Commission and the railway officials. In an interview in the *Herald* he said:

> There are innumerable instances of cities where progress has been impossible because of the friction and distrust between the company and the municipal government. Grand Rapids is fortunate in having worked out a plan for utility regulation which offers the most friendly co-operation with the company and does not hamper company initiative. Mr. DeLamarter and the company are to be congratulated for giving to Grand Rapids this acme of coach progress, a memorable milestone in the march of street railway progress and city transportation.

The *Herald* said editorially:

> The men responsible for the Grand Rapids Railway are of right supremely proud of the 27 new coaches which today will make their first public appearance. With them the people of Grand Rapids have a right to feel proud; and with the managers the people also deserve a share of credit for the thoroughness of this improvement. Month after month—ever since fire destroyed a large part of the local company's rolling stock—the public has ridden without protest in weather-beaten, ramshackle antiques. Confident of the accomplishment which today is revealed the public co-operatively made no protests. Because Grand Rapids always has had good railway service and the best of cars, this complacent acceptance of less than the best deserves mention. Today the confidence which that patient waiting evidences is justified in handsome measure. Our compliments to the Grand Rapids Railway, General Manager DeLamarter and the people of Grand Rapids!

PRESS COMMENT VERY FLATTERING

The Grand Rapids *Press* on Wednesday, June 9, said:

> They represent a faith upon the part of the local railway in this city's future. This faith has meant the exceedingly painful experience of passed dividends and heavy capital investment. It has grown out of a conviction that we have here an ideal town for such an experiment; a city disposed to deal fairly with its utilities, and a city destined to steady growth and a lasting industrial demand for traction service. It is a faith based on the knowledge that Grand Rapids is a progressive town capable of appreciating the best and worthy of advanced utility efforts to please.
>
> To quote the ELECTRIC RAILWAY JOURNAL, "if the net result is merely to stimulate a more general effort to improve the street car as a transportation merchandising agency, Mr. DeLamarter's strenuous efforts in the face of many obstacles and some skepticism will prove of invaluable service to the industry." That is the comment of Mr. DeLamarter's own business associates. His fellow citizens would like to add that they appreciate and approve his boundless confidence in this community and its destiny.
>
> Grand Rapids' new street cars are to go into service next Saturday. They provide this city with the most luxurious electrical transportation in the United States. They represent the ultimate, to date, in street car design. But they represent something else, of more importance though of a less tangible nature.

On Monday, June 14, the Grand Rapids *Press* printed this editorial under the heading "Public Be Pleased":

> Grand Rapids turned out Saturday in circus mood for Louis DeLamarter's parade of new street car equipment. Its enthusiasm is due to appreciation of a public utility which has said: "The public be pleased" instead of "The public be damned."
>
> Mr. DeLamarter has won a deserved and increasing popularity for his service. This popularity is evidence of his alertness, his canny sense of the best commercial appeal to make to a community in the name of electric transportation. It is evidence, too, of his rare business foresight with regard to the solid industrial prospects of this city.
>
> The *Press* recently commented upon the street railway and its investment, and upon Mr. DeLamarter. It does so again, because Saturday's public turnout was in the way of a confirmation of the methods adopted and investments made. Business men, officials, employees and ordinary citizens seized the chance to see the new cars and to ride in them. Good will was the day's keynote; and good will today must be the first asset on the books of a utility competing with automobile transportation.

All in all, Grand Rapids residents are proud of their new coaches and in welcoming them seem to have reacted to the psychology that was Mr. De Lamarter's aim—an increased patronage through comfort and attraction and winning the potential rider who wants to ease his pride in a vehicle that offers the same refinements as does his own automobile.

As a beacon welcoming the arrival of modern transportation for Grand Rapids, a colossal bonfire, fed by worn-out and obsolete street cars of the past, will be built at Comstock Park west of the company's property, Thursday, June 24. In accordance with the railway's custom of burning all useless equipment, Mr. DeLamarter will destroy these ancient models and borrowed cars because they are beyond possibility of repair or reconstruction. The bonfire will be a gala occasion and many features are planned for the celebration, to which the public is invited.

Nurses from Three Hospitals Rode in One of the Coaches

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Another First for Philadelphia

Daily passenger airplane service from Washington to the Sesqui-Centennial grounds will be opened by the Philadelphia Rapid Transit Company early in July. Fokker monoplanes will be used. The actual operating schedule has not been drawn up and the exact date on which the air line will begin operation will depend on when the ships are available for use.

The Navy Yard flying field will be placed at the disposal of the P.R.T. air line and a government field will be used at the capital. Technical operation of the monoplanes will be under the direction of Anthony H. G. Fokker, designer of the ships. He will also select the pilots. The line will be financed by the P.R.T. No indication has been given of the rate between the two cities.

Mayor Kendrick made the announcement about the new service. He said:

> This interesting and constructive plan of the P.R.T. means another "first" for Philadelphia. Establishment of commercial aviation between the cities of Philadelphia and Washington under the capable management of Mr. Fokker indicates that Philadelphia will assume leadership in this important method of transportation.
>
> It is indeed a contribution to the Sesqui-Centennial to have commercial air service started during the celebration.

The strides taken in commercial aviation in Europe greatly impressed Mr. Mitten, the P.R.T. head. Mr. Mitten said:

> The safety of commercial aviation is today an accepted fact in Europe. The air lines there have an enviable safety record. The London-Paris service in 1925 carried almost 20,000 passengers without serious accident. My personal observation upon the flying field was that airplanes are used very generally by business men, and that elderly ladies, who a few years ago would have been found knitting by the fireside, now gleefully and confidently use the air service.
>
> Ascertaining by cable that Mr. Fokker could and would build the necessary number of planes in the time allowed and would undertake the responsibility of supplying a safe and satisfactory service, I agreed to support a daily airplane passenger service between Philadelphia and Washington during the Sesqui, subject only to our receiving the co-operation of the government.
>
> Fokker three-engine monoplanes, equipped to carry ten passengers each, will be used in this service. Selection and supervision of the flying force will be under Mr. Fokker's personal direction. Wright air-cooled engines will be used in these planes, which embody the latest features of Fokker construction and flying qualities, non-stalling, non-spinning, and with perfect control at all speeds. They are actually safer than the Fokker planes which are now flying almost 10,000 miles a day on regular commercial air lines abroad.

New Power Contract Contemplated in Kansas City

B. J. Denman, vice-president of the United Light & Power Company, the holding organization of the Kansas City Power & Light Company, will continue conferences in connection with the projected purchasing of power from his company by the Kansas City Railways when it is reorganized.

The power plant of the railway is not as efficient as that of the Kansas City Power & Light Company and the railway reorganizers estimate that $1,500,000 would be necessary to put the plant upon an efficient basis. The light company, it is said, is able to furnish electric power to the railway at three-quarters of a cent per kilowatt-hour.

If these arrangements for power for the railway are completed, it is said that negotiations will include provision for the sale of the railway's power plant to the light company, by which it will be retained to handle peak loads and emergencies.

Apparently, the hydro-electric power project now under way on the Osage River is not to be considered at this time by the local organizations.

New Transportation Program at Columbia

A program adopted by the City Council of Columbia, S. C., provides that cars of the Columbia Railway, Gas & Electric Company are to be operated only on such lines as are profitable; zones, with 5-cent fares and no transfers are abolished, a straight 10-cent fare being charged, and additional buses are to be operated by the Carolina Transit Company to serve communities from which trolley service is withdrawn. Under the arrangement, transfers are to be provided, without additional charge, from the street cars to the bus lines and vice versa. The buses and street cars are operated by separate and independent companies.

The omnipresent jitney, regarded by many as the real disturbing factor in the transportation problem, is also handled in the program adopted by City Council.

A joint committee, composed of members of the South Carolina Railroad Commission and the City Commission of Columbia, in its report to the City Council said:

> We particularly desire to impress upon you our belief that neither the street car company nor the bus company can long survive jitney competition unless they (jitneys) are regulated in the city of Columbia.

And so the jitneys, carrying passengers anywhere in the city limits at 10 cents a head, operating on no regular schedule, are to be required to provide a $250 surety bond. This ruling, it is believed, will rapidly drive the jitney out of business, as most of the drivers will not care to supply that bond. With the free lance jitneys out of the running, the bus company and the railway, both of which are reported to be suffering from lack of nourishment now due to jitney competition, will have everything their own way and the citizens hope they will be able to make tongue and buckle meet.

The transportation problem has been much in the public eye in Columbia for several months. The general public has been singularly apathetic and indifferent with regard to it. The buses came, and while there was some hullaballoo, no very great row was made. The jitneys with 10-cent fares, the buses with 10-cent fares and the trolley cars with 5-cent fares (and a zone system) all struggled along and the wonder grew that all could continue to operate. The jitney drivers changed frequently, but the machines were kept in service somehow and hundreds of people favored them in that they carried the passengers direct to their homes. Now, however, it is believed that the jitney will be driven from the field and that buses will replace street cars on all except a few of the streets.

Essentials of New York Bus Situation Grasped by Wall Street Journal

ALREADY Mayor Walker has rather frankly indicated his acceptance of the view that surface lines on Manhattan island obstruct traffic and should be removed. That is, of course, not the only question involved in Mr. Craig's proposals. Even an affirmative answer on that point does not necessarily confirm the wisdom of buying the Fourth and Madison, the Eighth and the Ninth Avenue lines for $7,000,000. Equally important questions are: Whether the owners of these lines have anything to sell the city that is worth the price asked; whether surface transit lengthwise of the island should be motorized; **whether any engineering study of the advantages of buses compared, not with antiquated surface cars now feebly operated but with modern electric cars adequately maintained and competently run, has been made on the public behalf.**

If, as the Mayor appears to believe and as is sufficiently obvious in other ways, the city could have no purpose in buying these lines except to wipe them off the streets, the real nature of the transaction would be to pay $7,000,000 or some other sum to terminate the franchises involved. If their owners cannot make them pay, what are the franchises under which they were built worth? **A franchise which has become only a permission to lose money in the city streets cannot have any value.**

Mr. Craig's explanation that most of the persons interested in these lines are well along in life and do not care to "deplete their estates" by investing in new equipment has no application to at least one of the properties. He and his associates acquired the Fourth and Madison Avenue line within recent weeks from the New York & Harlem Railroad, a corporation amply able to finance rehabilitation of its surface line if its management saw any promise of adequate profits ahead. As to the others, aged persons who are not looking for a hazard of new fortunes can always find a market for a property which needs only young blood and capital to revive its prosperity.—*Wall Street Journal.*

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Terms of New Agreement Discussed at Tacoma

With an agreement from the start that both sides shall "lay all their cards face up on the table" negotiations have been undertaken between the new City Council and the Tacoma Railway & Power Company, Tacoma, Wash., for a settlement of the car problem. The new Mayor, Melvin G. Tennent, who replaced Mayor Fawcett, the sworn enemy of the transportation company, presided at the first conference. He announced as the aim of the City Council "the lowest possible fare consistent with good service for all the city and fair treatment of the company." He suggested that the company should allow the city's representatives to assist in working out any economies of operation. One such means of economy suggested is the stopping of cars at every third block in the residence sections.

Among the preliminary matters disposed of at the first conference was the commitment of the Council to inclusion of an interchange of transfers between the Tacoma Railway & Power Company's cars and those of the municipal belt line on the tideflats, service to outlying sections and convenient sale of any tokens or passes agreed upon as necessary parts of any settlement.

Statement by the company of the lowest valuation upon its properties which it will feel justified in accepting as a basis of computation of a fair return was agreed upon as the foundation upon which actual arbitration of terms must rest. It was agreed that 6 per cent would be taken as a tentative rate of return to use in computations.

An important understanding proposed by Mayor Tennent and agreed upon was that no conversations or conferences upon the transportation problem should be held by individuals of opposite sides of the conference body, but that whatever was done would be done by the body as a whole.

New Tentative Ordinance for Louisville

A tentative ordinance has been placed in the hands of Mayor A. A. Will by the Louisville Railway, Louisville, Ky., providing for a straight 7-cent fare and a 10-cent combination bus and railway fare, with transfers.

According to the proposed plan, bus lines would be used for extension of suburban service, and one or more of the more important street car lines would be extended. The ordinance would make a 7-cent fare the basic fare and arrange for increasing this fare, if conditions and earnings warranted it. It would remove regulation of the company from the hands of the Board of Public Works. Rate changes would be acted upon by the General Council, and would not be automatically controlled by a barometer fund as at present. Properties of the company would be appraised by the city and company and a valuation established, with earnings regulated through fares to guarantee a reasonable return on investment. The new regulations, it was stated, were based on the transportation act of 1920, with such changes as needed to fit local conditions. Under the new plan the standard bus fare would prevail on combination bus and street car trips. School teachers and pupils would be carried at half fare and policemen, firemen and park guards would ride free when in uniform.

Under the present regulations there is a 7-cent fare, but under a sliding scale, in which a barometer fund establishes the rate, at either 6 or 7 cents. There are no transfers from cars to bus. The buses are operated by the Kentucky Carriers, Inc., a subsidiary of the Louisville Railway, and the cash bus fare is 15 cents, with four tickets for 50 cents.

Des Moines Residents Enjoy Riding All Day for Quarter

The Des Moines City Railway, Des Moines, Iowa., sold 5,484 passes on its intial "all-day-for-a-quarter" Sunday plan and passengers traveled 37,131 times on these tickets, which were good from 5 a.m. Sunday to 5 a.m. Monday. The regular fare is 10 cents. Car riders on the try-out day averaged nearly seven rides for each ticket.

Des Moines is the third city in the country to give a try-out to the plan intended to boost traffic on what is ordinarily the lightest day of the week. The proposed installation of the plan was mentioned in the ELECTRIC RAILWAY JOURNAL issue of June 5, page 989. Pittsburgh initiated the plan and it has been tried in Wheeling, W. Va.

Oil-Electrics for Freight Movement in Rochester

Freight lines on the new industrial railway built by the city of Rochester, N. Y., in the bed of the abandoned Erie Canal through the heart of the city will be operated by oil-electric locomotives.

This was revealed when bids were opened by the City Board of Contract and Supply on electrification of the road from Brighton, on the eastern limits of the line, to the Barge Canal on the west. The specifications, as revised, call for electrification of two passenger tracks and operation of freight lines by oil-electric engines. By this move 4 miles of electrification were saved, city officials asserted.

It is expected that the subway will be in operation in the fall. The tracks are laid, stations and bridges completed and only the electrification work is to be finished. The operator of the railroad has not been decided upon. That matter is still in the hands of a committee of citizens appointed by Mayor Clarence D. Van Zandt, "the father of the subway." It is deemed improbable that the city will attempt to operate the system. Rather it is thought that some operator, most probably the New York State Railways, which has the needed equipment, will lease the subway railroad. The line will carry passengers from the outskirts, take care of all interurban lines entering the city and serve industry by freight hauling and switching.

"The Shartel Monuments"

Some idea of the high regard in which John W. Shartel, the late president and receiver of the Oklahoma Railway, Oklahoma City, Okla., was held by his subordinates and associates is shown in the tribute to him in the *Oklahoma Railwayan*, the official paper of the company.

Through this vehicle George G. Barnes, who worked with Mr. Shartel in legal undertakings for many years, expresses what he thought of the man who 30 years ago went to Oklahoma and not only dreamed his dreams but made them come true. Another tribute, signed "M.W." is entitled "The Shartel Monuments," wherein it is hoped that Mr. Shartel with phantom fingers will direct the street cars, still "showering the wealth of his great genius upon them even in death."

It was said that, to his intimate friends, Mr. Shartel expressed the desire to retire from the active management of the Oklahoma properties and devote the major part of his time to the writing of histories of the American Revolution and the war of the states. The tremendous difficulties which faced the company, however, delayed his retirement, and at the time of his death he was but awaiting the moment to withdraw.

Rights Under Indeterminate Permit Fixed in Indiana

When a public utility surrenders its franchise with a municipality and takes an indeterminate permit from the Indiana Public Service Commission, all the rights, powers and duties which existed under the franchise in favor of either party to the franchise are abrogated. The Indiana Supreme Court has so ruled. The case arose in South Bend, where the Chicago, Lake Shore & South Bend Railway, an interurban line now known as the Chicago, South Shore & South Bend Railway, had a provision in its franchise with the city of South Bend which permitted it to run a track in La Salle Avenue, one of the principal streets of the city. One clause of the franchise, however, restricted the company from handling freight in this street except as might be provided by city ordinance.

A few years ago construction work was started on some large buildings in this street and the company was asked by the contractor to haul material to and from the scene of construction. City officials did not object and the company agreed. Property owners, however, brought injunction proceedings. They won the case in the Superior Court. Between the time of the filing of the suit and the trial of the case the company surrendered its franchise and took out a permit from the Public Service Commission. Attorneys of the company took the position that the surrender of the franchise abrogated all restrictions and the company was at liberty to operate freight trains under the 1920 law, which gives interurbans that right.

The property owners contended that the surrender of the franchise affected only such matters as fares, charges and character of service.

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Aldermen Pass Richmond Franchise Over Veto

The Board of Aldermen of Richmond, Va., has overridden Mayor Bright's veto. On June 15 it passed the blanket franchise sought by the Virginia Electric & Power Company by a vote of nine to three. Eight votes were necessary for passage. The Common Council had previously overridden his veto. Sale of the franchise will be advertised for four consecutive weeks, after which the Council will examine bids.

Members of the board were supplied with a statement showing the per cent of tax charged on gross receipts on traction business in other cities. According to this statement, Baltimore was the only city showing a greater rate than 3 per cent. The present rate in Richmond is 6¼ per cent. The Virginia Electric & Power Company sought a 3 per cent tax. Five per cent for the first year, to be graduated downward over a period of ten years until it was 3 per cent, to remain for the next twenty years (the life of the franchise being 30 years), was agreed upon as a compromise. The Mayor wanted the tax to remain at 6¼ per cent. It was for this reason he vetoed the measure.

The terms of the proposed new grant have long been the subject of discussion and negotiation.

Safety Talks for School Children

Conductor S. J. Steele and Operator J. E. Watson of the railway department of the Georgia Railway & Power Company, Atlanta, Ga., were asked by Principal J. H. Smith of the William A. Bass Junior High School to speak to the students on "Safety" as part of the school's program for "Safety Week." Mr. Steele warned the students always to go to the right-hand curb after alighting from a street car and never to hold to the side of a street car while riding a bicycle or roller skating. Mr. Watson, who operates a one-man safety car, illustrated his talk with a number of examples of how stopping the street car has many times saved people from injury after their own carelessness has placed them in danger.

Talks by operators and conductors before school children, according to officials of the company, open an entirely new line of attack upon the problem of safety on the streets, and men in the employ of the company will be encouraged to make such talks when the demand for them arises.

Court Dismisses Suit Against Philadelphia Rapid Transit

Judge Dickinson in the United States District Court on June 8 dismissed the suit of Daniel J. Furey against the Philadelphia Rapid Transit Company, in which he asked the court to order a refund of approximately $57,000,000, alleged to have been collected in excess of a 5-cent fare. The court declared that Furey had no cause for action in the matter because the State Supreme Court had passed on the constitutionality of the Public Service Commission act and other points brought out by Furey in his case.

News Notes

Sesqui Edition of "Traveler."—The Philadelphia Rapid Transit Company, Philadelphia, Pa., has issued a Sesqui-Centennial edition of its "Traveler," a guide book with a description of all the city's transit facilities. The new edition carries the cover designed by John J. Gough, to whom a $500 prize was awarded on May 1. A feature of the book is a map 17 in. x 28 in. showing trolley and bus routes throughout the city.

Plea for Continued Freight Rates Heard.—Hearing on the petition of the Salt Lake & Utah Railroad, Salt Lake City, Utah, for the maintenance of transcontinental rates on westbound shipments and the establishment of such rates on eastbound shipments of freight was commenced recently in Salt Lake City before Examiner W. A. Hill of the Interstate Commerce Commission. The Salt Lake & Utah, which is also known as the Orem line, has enjoyed the privilege of giving transcontinental rates on westbound shipments which it hauls in connection with the transcontinental railroads, and recently applied to the commission for the right to establish the same rates on eastbound shipments. This causes the Union Pacific to apply to the commission for a cancellation of all rights on the part of the local railroad to charge transcontinental rates. The petition of the Orem line now being heard, therefore, asks the commission that the plea of the Union Pacific be not granted, and in addition that the eastbound through rates, not heretofore enjoyed, be established.

Fare Collecting Changes.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., will install a new system of fare collection on routes 11 and 34, eastbound cars, beginning June 20. The innovation will allow the company to operate one-man cars on these routes. Passengers on these routes will pay fares to conductors if they leave the car before it enters the subway. If they ride into the subway, they pay their fares to cashiers at stations after they leave the car. Automatic turnstiles are being installed for this purpose.

Higher Fare May Be Sought in Sandusky.—It is said that the Lake Shore Electric Railway of Cleveland gave notice to the City Commission of Sandusky, Ohio, that it intends to present a franchise providing for a 7-cent fare instead of the present 5-cent fare on the company's city lines. The officials explained that revenue of the city lines had been failing to meet operating expenses. The 25-year franchise, under which the company has been operating city cars in Sandusky, expires in July.

Order Affects Grade Crossings.—The Public Service Commission of Pennsylvania has decided that the Scranton Railway must maintain watchmen at all grade crossings in the city and vicinity where one-man cars are operated. In addition the company must also have one-man cars come to a stop within 15 ft. of each crossing in order that the motorman-conductor can satisfy himself as to the safety of proceeding. When the Scranton Railway, some months ago, applied to the commission for the modification of the law compelling the placing of watchmen at grade crossings, former City Solicitor P. V. Mattes filed a petition on behalf of the city protesting against the request. A hearing was held before the commission, at which time City Solicitor C. B. Little presented arguments on behalf of the city. The commission ordered an investigation by its own engineers, with the result that the stand of the city was upheld.

Would Spend $15,000 on Repairs.—The Cincinnati Street Railway, Cincinnati, Ohio, has requested authority from Edgar Dow Gilman, Director of Street Railroads and Motor Buses, to spend $15,000 in making repairs on the Fairview incline, which has been closed down by the railway. Pending action of the director, the railway has rerouted its College Hill cars in order to give the residents of Clifton Heights and Fairview, ordinarily served by the incline, adequate car service. In the event the new rearrangement proves satisfactory, it is likely that Mr. Gilman will authorize the abandonment of the incline instead of making the necessary repairs.

Hearing on Electrification Deferred.—At the request of William A. Jones counsel for the Richmond Hill Board of Trade, the Transit Commission has adjourned until Oct. 15 the hearing on the application of the board and other petitioners for the electrification of the Glendale cut-off of the Montauk Division of the Long Island Railroad. Mr. Jones said that it would be difficult to produce witnesses during the summer, as so many persons interested in the matter would be away.

Hearing on Fare Application Delayed.—Ignoring the protest of the United Traction Company, Chairman Pendergast of the Public Service Commission recently granted the request of the city of Albany, N. Y., for a delay of two months in hearing the application of the company for an increase in fare. The commission at the same time promised a speedy decision on the contention of the city of Troy that a franchise binds the company to a 5-cent fare on its lines in that city.

Freight Car Contract Approved.—No opposition appeared when the Massachusetts Department of Public Utilities gave a hearing on the application of the Boston Elevated Railway, Boston, Mass., for the approval of a contract with the Boston & Worcester Street Railway for operating freight cars of the latter company over lines of the "L" in Boston. The new contract is a revision of the contract in force between the two companies since 1912. The chief changes in the new contract are in the rate increase for power used and a provision for operating cars by employees of the Boston & Worcester instead of "L" carmen as at present. The use of Boston & Worcester employees in operating its cars means a substantial saving to the latter company, as wages of the Boston & Worcester employees are lower than those of the elevated employees.

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Recent Bus Developments

Dates Fixed for I.C.C. Bus Hearings

A schedule of thirteen hearings in cities from coast to coast was announced by the Interstate Commerce Commission on June 16 in connection with an exhaustive investigation of motor truck and motor bus operation by and for and in competition with the railroads.

The hearings will begin at Chicago July 27 before Commissioner Esch and Examiner Flynn and will be closed in Washington on Sept. 29. All parties in New York with an interest in the matter will be heard at a session to be held in the Merchants' Association Rooms, 233 Broadway, on Sept. 10. The schedule of hearings follows:

Chicago, July 27; St. Paul, July 30; Portland, Ore., Aug. 7; San Francisco, Aug. 12; Los Angeles, Aug. 17; Denver, Aug. 25; Detroit, Sept. 1; Boston, Sept. 8; New York, Sept. 10; Dallas, Sept. 20; Kansas City, Sept. 24; Washington, D. C., Sept. 29.

In a session ordering the hearings the committee prepared a detailed questionnaire which must be answered by every common carrier subject to the Interstate Commerce laws requiring information as to all motor operations by them, by subsidiaries or by competitors.

The questionnaire will not go to the so-called independent motor bus and motor truck operators. It was learned, however, that the independent operators will come in as parties at interest through various state and national organizations and arrangements have been made by the commission to give them a full hearing.

Under the present arrangement the railroads will be heard first, then the operators of buses or motor trucks and then other interested parties, including representatives of shippers and state or municipal utility commissions.

Independent Bus Rights Lost in Tacoma

In connection with negotiations opened with the Tacoma Railway & Power Company, Tacoma, Wash., for a settlement of the transportation problem of the city, Mayor Tennent has stated that the Council considered that when the Puget Transportation Company, to which bus permits had been granted, discontinued service several months ago, it canceled its permits and the Council would not risk further complications with renewed service just at this time. The Mayor said, however, that if the negotiations with the railway did not work out favorably, the city might again resort to the bus for service. City attorney Murray expressed the opinion that there was no question of the right of the Council to declare the permits void by reason of discontinuance of service, but that a resolution would have to be adopted setting forth the grounds for cancellation and fixing a date for a hearing at which the company should have an opportunity to defend itself. Permits issued last year to the Puget Transportation Company for twelve buses on the Point Defiance line have already been revoked, and the bus company has been admonished not to start regular service under the old permits, a course it had threatened to pursue.

Blanket Bus Permit Denied by Ohio Court

The Supreme Court of Ohio on May 27 reversed a decision of the Public Utilities Commission granting franchises over irregular routes to the Buckeye Special Transit Company. Some sixteen existing transportation companies, both steam and electric, had appealed from the decision of the commission and that brought the case before the Supreme Court.

The refusal to grant the franchises requested by the Buckeye company was based on three grounds. For one thing the company had not followed the rule which required the application to be advertised for three weeks in a newspaper of general circulation published at the county seat of each county in the state in or through which the applicant proposed to operate. Practically, of course, this would have meant an advertisement of the application in each of the 88 counties of the state.

The second ground for the reversal of the regulation was that the company had not shown that the regular lines of transportation service were not furnishing reasonable facilities.

The third ground was that casual and unusual service such as heretofore has been rendered under private contract is not the proper subject matter of a certificate of public convenience and necessity. The court says:

> The whole subject of public motor transportation is new, and it is not surprising that the legislation on this subject has failed to meet all of the problems presented.

It is also quite certain that further legislation will be required definitely to authorize the commission to grant such wholesale service without compliance with all the requirements of notice and statement and of proof of necessity and convenience applicable to smaller and regular operators.

Excursions by Bus by Interstate

The Interstate Public Service Company has arranged to run a series of excursions by bus to all of the state parks and to other points of interest in Indiana. The first excursion was set for June 6 from Indianapolis to Brown County by the way of Franklin and Columbus and returning by the way of Bloomington and Martinsville. The trip was planned so as to give those taking it four hours in Brown County. The excursions will be conducted personally by representatives of the Interstate.

Party Business Profitable in Kansas City

According to a statement credited to Francis M. Wilson, one of the receivers of the Kansas City Railways, Kansas City, Mo., the use of the bus in that city has increased to a marked degree since the advent of hot weather. This increase has been noticeable both in the patronage of the regular schedule routes and in the business of chartering buses for special hire, started by the receivers some time ago.

The receivers have found the special charter and party business a very profitable phase of bus transportation and have made every effort in recent months to increase this class of patronage by large parties at night after rush hours on the regular lines is over.

Mr. Wilson also said the receivers have found it difficult to determine the source of bus patronage, but he estimates that about 60 per cent of the bus revenue represents a loss in street car patronage.

According to the statement, the loss of about $20,000 a month on the buses is attributed to the use of pneumatic tires and to the fact that buses in Kansas City are not allowed to carry standing passengers. Tires are said to cost the company 3.8 cents per mile, and Mr. Wilson estimated that the use of solid tires would cut this expense to less than 1 cent per mile. He also said the buses would carry nearly twice the number of passengers now carried, if passengers were permitted to stand.

According to F. G. Buffe, general manager for the receivers, the Kansas City Railways' bus system is being operated as cheaply as are similar services in other cities, despite the fact that in Kansas City no line has a grade of less than 5 per cent to travel while on some of the routes the grade is as much as 13 per cent.

The buses are leased to special parties at the rate of $7.50 an hour, with special rates effective where intervals of waiting are required. The demand for this class of service is growing rapidly among clubs, conventions, societies, etc., for special trips of all kinds. The receivers have frequent calls to meet special parties at the Union Station to take visitors for a tour of the city or on other trips.

No Action on Chicago Bus Offer

Pending the outcome of an investigation by the Cook County Board of Commissioners no action has been taken on the standing offer of the Chicago Motor Coach Company to operate buses from points where street car lines and steam railroads touch the public forest preserves of Cook County to various picnic, swimming and scenic spots now inaccessible to all but the private autobilist. The motor coach company desires to establish this service in advance of the International Eucharistic Congress, which will bring hundreds of thousands of visitors to this section from all parts of the world on June 20. Inasmuch as the service proposed will be furnished on Saturday afternoons, Sundays and holidays only, there is a possibility that the city of Chicago will agree to subsidize the lines.

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Receiver Sought for Ohio Bus Line

The Red Star Company, a bus line which some months ago disposed of its rights between Springfield and Dayton to the bus subsidiary of the Indiana, Columbus & Eastern Traction Company, now proposes, it is said, to do likewise with its Springfield-Columbus franchise. Suit asking for the appointment of a receiver was filed in the Clark County Common Pleas Court recently.

The plaintiff avers that the Red Star Company is indebted to him in the sum of $1,028, representing unpaid premiums on insurance policies. He declares that a deal is pending whereby the "sole assets of the company," namely, certificates of conveyance issued to the company by the Ohio Public Utilities Commission, are to be transferred to the Columbus & Springfield Transportation Company. All other property used by the lines is held in the names of individuals, the plaintiff said. He asks for an injunction to restrain the company from disposing of the conveyance certificates until his suit has been heard.

No Action on New York Bus Proposals

At a conference of the members of the Board of Estimate of New York on June 15, it was decided to have an analysis made of each application for the right to run buses in the city. These analyses will be made by the Board of Transportation and the Bureau of Franchises of the Board of Estimate and it is expected that they will be ready by July 1. As soon as these reports are completed the board will be reconvened in a closed session on the call of Mayor Walker to resume consideration of the bus situation. It was said on excellent authority that the award of a franchise or franchises would probably not be delayed long after that.

Mayor Walker is understood to favor a city-wide system to be operated by one company, if terms can be obtained in that way which will be as advantageous to the city as would be the award of a franchise for each borough.

Another phase of the bus situation will be considered on July 22 when the Board of Estimate will hold its hearing upon the proposal of former Comptroller Charles L. Craig for the city to buy the Fourth and Madison Avenue, Eighth Avenue and Ninth Avenue surface lines to clear those streets for bus routes.

Mayor Wants Independent Buses in Buffalo

Mayor Frank X. Schwab of Buffalo, who has been in Europe two months studying bus transportation, has returned to Buffalo with a proposal to license the operation of independent bus lines over various streets of the city in competition with the International Bus Corporation, a subsidiary of the International Railway. Mayor Schwab says a transportation emergency exists in Buffalo and he is willing to have the city purchase at least 50 buses immediately.

The City Council was informed by the Mayor that he was opposed to granting additional bus franchises to the International Bus Corporation in view of the public statement of Bernard J. Yungbluth, president of the railway and bus companies, that the corporation lacked funds with which to finance improvements to its system as ordered by the Public Service Commission.

The Mayor's opposition to the bus plan of the International Railway is not unexpected. Last summer he sponsored the Ernest M. Howe 5-cent bus plan. This proposal collapsed when the company headed by Mr. Howe was unable to get financial assistance.

Application of the company for permits to operate additional bus lines in Buffalo, was held up by the City Council pending the return to Buffalo of Mayor Schwab from Europe. Voters demanded a referendum on the proposed franchises when it was apparent the Council would approve the permits in Mayor Schwab's absence. In view of widespread opposition to the new permits, it was apparent the voters would defeat the franchises.

Bus Terminal Extended.—The Public Service Commission on June 11 authorized the Mid-State Coach Lines, Inc., to extend its authorized terminal for its Oswego city bus route from East Tenth and Church Streets to the city line on the Hall Road, a distance of about 1 mile.

Company Must Keep to Agreement.—The City Council of Marlboro, Mass., has threatened to revoke the bus license of the Boston & Worcester Street Railway to operate buses in the city if the prediction of a group of Marlboro employees that they may be dropped from the company payroll is correct. The city has an agreement with the road whereby it will retain all Marlboro residents employed at the time the company put buses on instead of trolley cars for passenger service.

Will Abandon Part of Bus Line.—A petition seeking authority to abandon the operation of that part of its bus line between Fort Wayne, Ind., and the Indiana-Ohio line has been filed with the Indiana Public Service Commission by the Fort Wayne, Van Wert & Lima Traction Company, through its receiver, Henry C. Paul. The bus line in question is part of the line operating between Fort Wayne and Lima. The petition alleges that revenues of the first four months of this year were far less than operating expenses.

Bus Route in Auburn Extended.—The Public Service Commission on June 11 granted the petition of the Mid-State Coach Lines, Inc., for permission to extend its route in the city of Auburn by operating over the route formerly served by the North Street line of the Auburn & Syracuse Electric Railway. The commission denied the petition for a certificate authorizing bus operation over practically the same route now used by the local trolley line. It was stated at the hearing that the company did not propose to start operation over this line immediately, and permission to abandon the trolley line has never been asked.

Competitor for Schenectady Railway.—Application for the operation of a bus line which would come into direct competition with the Schenectady Railway, giving interurban service between Albany and Schenectady, was made recently by William G. Schultz, Lathams, who asks for a certificate to operate one 25-passenger bus between Albany and Schenectady under the name of the Albany, Colonie & Schenectady Bus Line. It is proposed to make four round trips a day and add other buses as the demand warrants. The Albany Common Council recently passed an ordinance giving the necessary local consent.

Bus Permits Allowed.—The Illinois Power & Light Corporation has been granted formal permit by the Illinois Commerce Commission to operate buses on several Bloomington and Normal, Ill., streets and to establish a line between the two cities.

Bus Report Satisfactory.—It is announced that earnings of two buses placed in operation on June 2 over a new route by the Evanston Bus Company, a subsidiary of the Evanston Railway, are already more than equaling operating expenses.

Must Conform to Paving Rules.—The proposed plan of the Madison Railways to abandon its Harrison Street car line and substitute bus service along Regent Street met with a setback when the Common Council adopted the recommendation of its special street railway committee which requires the company to bring its tracks up to grade and make other repairs to its right-of-way in conjunction with the city's new paving work on Harrison Street between Monroe Street and Keyes Avenue.

Buses Between Omaha and Papillion. The Omaha & Lincoln Railway & Light Company, Ralston, Neb., has been authorized by the Nebraska State Railway Commission to abandon car service between Omaha and Papillion and substitute buses. The company was out of pocket $3,548 last year in operating the lines. Morning and evening a car will be run as far as Ralston, halfway to Papillion in order to keep the franchise alive. The rest of the tracks will be taken up.

Bus Franchise Granted.—The town of Easthampton, Mass., has granted a franchise to the Boston & Maine Transportation Company to run buses between Easthampton and Mount Tom Junction, to take the place of the passenger service hitherto maintained by the Boston & Maine on the branch line between these points.

Bus Extensions in Rochester.—The Rochester Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways added two lines on June 14 to its rapidly growing bus system. Service was begun on the Emerson Street extension and the Glide Street routes, both feeder lines, to serve the extreme western border of the city. The Emerson line will be extended to connect with two trolley lines. Both of these lines serve growing factory and residential districts. A half-hour running schedule will be maintained, and as traffic warrants, the schedule will be increased and equipment added.

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Financial and Corporate

Foreclosure Sale Confirmed

Way to Reorganization Cleared by Federal Judge in Approving Kansas City Purchase Action

Final objections to the reorganization plan of the Kansas City Railways, Kansas City, Mo., were ruled out by Judge Kimbrough Stone on June 15 in closing the hearing on the decree confirming the sale of the property to the Kansas City Public Service Company. The court indicated that formal confirmation of the order would be made during the week ended June 19.

Actual possession of the property will not pass to the new owners until the fall. It is estimated that all the cumbersome preliminaries to the transfer cannot be accomplished in less than 60 or 90 days. The property is to be paid for by turning in first mortgage bonds. While these bonds largely have been assembled in depositories in larger cities, there are some 40,000 separate bonds. Their careful handling, checking and recording will be a matter of weeks.

After John T. Harding, special master commissioner, takes over the funds in the receivers' treasury and makes the necessary disbursements, including various allowances, the new purchasers of the property are allowed 30 days to assemble and transport the bonds to Kansas City. Mr. Harding has been granted two months in which to check these before issuing a deed to the Kansas City Public Service Company.

Compensation to the receivers and other parties who have served directly or indirectly as officers of the court in connection with the receivership will be made the subject of a special order, expected to be signed within a few days.

Five Kansas City business men, including R. A. Long, chairman of the board of the Long Bell Lumber Company, testified before the court on June 14, estimating the value of the receivers' services at from $50,000 to $75,000 a year apiece. Receivers Fred W. Fleming and Francis M. Wilson, F. G. Buffe, general manager, and several department heads testified regarding the accomplishments of the receivership. Each receiver has been paid to date $115,000. Their services now are in the ninth month of the sixth year.

On June 14 the Continental & Commercial Trust & Savings Bank, Chicago, trustee under the first mortgage, asked $35,000 as a fee for services it had rendered. The fee applied for in behalf of R. J. Higgins, counsel for the first mortgage trustees, was also $35,000. The firm of Mayer, Meyer, Austrian & Platt, attorneys for the first mortgage bondholders, asked a fee for a similar sum. The fee for services of both receivers, of James E. Goodrich, counsel for receivers, Charles L. Carr, assistant to Judge Goodrich, and others to whom final allowances will be made have been left to the discretion of the court.

The decree confirming the sale of the railway to Kansas City Public Service Company was signed by Judge Stone late Wednesday. Allowances were made as follows: To receivers, $71,000 each in addition to amount already paid; to Judge Goodrich, $59,000 in addition to amount already paid; to C. L. Carr, $3,000; to Continental Bank, $5,000; to Mayer & Platt, $35,000; to R. J. Higgins, $35,000; to John Harding, $6,500 in addition to amount already paid; to E. F. Swinney, $10,000; to William G. Holt, attorney for the Armour interests, $10,000; three other minor allowances.

City Moves in Rochester Valuation Case

The city of Rochester, N. Y., has made its first court move in its long-standing suit for a reappraisal of the valuation of the Rochester lines of the New York State Railways under which the present service-at-cost contract between the city and the railways was fixed.

The question submitted to Supreme Court Justice Adolph J. Rodenbeck was to determine whether by deferred action the city had not forfeited its right to ask revaluation. George Draper, assistant corporation counsel, argued for the city that action for the suit was in reality instituted within the first two years of the contract. Should Justice Rodenbeck rule that the city had acted in time, the city's fight would start in earnest, Mr. Draper said. The reappraisal would entail employment of experts at heavy cost to both sides. James F. Hamilton, president of the railway, recently made a compromise offer to obviate the necessity of a suit, but his proposal was rejected by the city.

The city contends that in the original base valuation of $19,216,000, made five years ago, the appraisers failed to make proper allowance for depreciation. The railways was willing to compromise at $1,000,500 less than this figure although Mr. Hamilton said he believed the original appraisal to be fair. His motive in making the offer, he said, was to eliminate a long and costly litigation.

Local Banks Gets Jacksonville Bonds

Consideration of bids for the $55,000 bond issue authorized to apply on the purchase price of the four new cars which have been added to the rolling stock of the Municipal Railway of South Jacksonville, Fla., was recently undertaken by the City Council. As a result the Florida South Side Bank, whose bid of $54,367.50 was the highest submitted, was awarded the issue. The bonds are of $1,000 denomination and will mature July 1, 1955. The road is run under a lease from the city which guarantees the operator against loss.

$41,175 Balance Reported by Indianapolis Street Railway

Total net earnings of the Indianapolis Street Railway, Indianapolis, Ind., for the year ended Dec. 31, 1925, less taxes were $1,116,924. This compares with $1,120,072 for the year 1924. The balance for 1925, after all deductions, was $41,175. These facts are contained in the report of the company presented at the annual meeting of the stockholders on June 9, 1926.

On account of the large decrease in revenue from city passenger fares and the transfer charge of 1 cent, shown in the report under "Earnings and Operating Expenses," it was found necessary, as a partial relief, to petition the Public Service Commission on Nov. 17, 1925, to allow a charge of 2 cents instead of 1 cent for each transfer.

After a full hearing this was granted, beginning Jan. 1, 1926. It is estimated that this increase should produce $150,000 additional revenue per annum, but thus far in 1926 the falling off in revenue passengers and the added expense of running the Broad Ripple line and operating buses have more than absorbed all of this increase.

In order to serve outlying territory and to protect itself from further en-

INCOME ACCOUNT OF THE INDIANAPOLIS STREET RAILWAY FOR YEAR ENDED DEC. 31, 1925

Gross Earnings:	Year 1925
Passenger receipts—city lines	$4,754,227
Transfer receipts—city lines	176,492
Track rentals interurban passenger cars	110,301
Track rentals interurban freight cars	54,675
Chartered cars	1,317
Advertising	31,020
Dog permits, etc	1,299
Rent of land and buildings, miscellaneous	27,753
Rent of terminal building and stations	236,469
Sale of power	6,910
Rent of equipment	2,045
Miscellaneous income	104
Receipts, Broad Ripple line	86,142
Bus receipts	40,966
Interest, discount, etc	6,649
Total	$5,536,369
Operating Expenses:	
Maintenance of way and structures	$631,678
Maintenance of equipment	517,988
Special maintenance, per order of Public Service Commission of Indiana	20,708
Operation of power plant	734,466
Operation of cars	1,682,517
General expense	445,464
Total	$4,032,821
Net earnings	$1,503,548
Less taxes	386,624
Total net earnings, less taxes	$1,116,924
Deductions—Bond Interest:	
Interest on $4,000,000 Citizens Street Railroad 5s	$200,000
Interest on $4,664,000 Indianapolis St. Ry. Co's. 4s	188,030
Interest on $3,635,000 Indianapolis Trac. & Term. Co's. 5s	181,919
Interest on $200,000 Broad Ripple Traction Co's. 5s	10,000
Interest on trust equipment notes	3,798
Interest on Indianapolis Car Equipment Company Preferred stock	5,450
Interest on notes, etc	39,986
Total deductions	$629,193
Surplus (exclusive of accrued depreciation)	$487,741
Deduction from Surplus:	
Indianapolis Street Railway sinking fund	$76,666
Indianapolis Traction & Terminal Co. sinking fund	69,900
Dividends paid on $5,000,000 preferred stock 1925	150,000
Dividends unpaid on $5,000,000 preferred stock 1925	150,000
Total deduction	$446,566
Balance	$41,175

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croachments of independent bus lines the company has established seven feeder bus lines, connecting with the company's street cars at certain points, and has also put in operation three through bus lines reaching the center of the city. This service has required the purchase of 30 buses at a cost of $270,000.

There have been no quarterly dividends paid on the preferred stock of the company since June 1, 1925, on account of decreased earnings, due to the constantly increasing use of privately owned automobiles, more or less unemployment and the very serious inroads made by independent bus competition.

STATEMENT OF GROSS EARNINGS, MAINTENANCE, OPERATION AND TAXES OF THE INDIANAPOLIS STREET RAILWAY

Earnings	1925	1924
Passenger receipts—city lines	$4,754,227	$4,804,890
Transfer receipts—city lines	176,492	246,110
Miscellaneous earnings—track rentals, etc	605,649	537,175
Gross earnings	$5,536,369	$5,588,176
Maintenance of way and structures	$631,678	$631,201
Maintenance of equipment	517,988	516,272
Special maintenance expended from revenue from increased fares by order of Public Service Commission	20,708	122,910
Total maintenance	$1,170,375	$1,270,384
Operation of power plant	$734,466	$771,997
Operation of cars	1,682,517	1,616,028
General expenses	445,462	425,338
Total operating expenses	$4,032,821	$4,083,749
Net earnings	$1,503,548	$1,504,427
Less taxes	386,624	384,354
Net earnings, less taxes	$1,116,924	$1,120,072

The building owned by the company adjoining the passenger terminal station on Market Street, which was formerly used as an interurban freight house, was remodeled during the year 1925 for the accommodation of buses operated by the various interurban companies and certain other bus lines. The facilities afforded by this change have attracted nearly all of the bus lines running out of Indianapolis so that at present it is the principal bus terminal operating in the city, the only other bus terminal in the city being the small one on Kentucky Avenue, which was used by the independent bus lines when they started. It is explained that the volume of business should result in increased revenue from terminal charges and added value to the rental privileges in the Terminal Building, as well as to the rent of offices.

The company has at present 26 one-man safety cars in service. These are used on lines where travel is not heavy. Some 80 more cars will be converted for one-man operation. This will, it is expected, result in a substantial saving in operating expenses.

Original Valuation in Buffalo Holds.—The International Railway, Buffalo, N. Y., has lost its fight to have the Public Service Commission increase the valuation of its system as fixed by the commission several years ago. The company sought a higher valuation to lay the basis for a fare increase on its local lines in Buffalo. The state utilities board ruled that the original valuation must be sustained.

Lower Balance on Kansas City Interurban

While the operating results of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., for the year ended Dec. 31, 1925, show a decrease in business for the year as a whole, conditions changed for the better beginning about Oct. 1, and a comparison of the last three months shows an increase over a similar period for 1924 in gross revenue and net income, revealing an earned surplus in excess of dividend requirement for the three months. This was the opening statement in the annual report to the stockholders for the year ended Dec. 31, 1925.

The total number of passengers carried in 1925 was 1,660,991, against 1,936,875 in 1924. The earnings, however, will show a greater per cent of decrease due to decrease of through passengers and an increase of commuters. The passenger business shows an increase in number in October, November and December over the corresponding months in 1924. The report states that as an item of interest there were 781,945 passengers carried on the Excelsior Springs division of the electric railway during the year, or about twice the number carried on all bus lines operating over the same territory.

The Kansas City, Clay County & St. Joseph Auto Transit Company, while working in conjunction with the railway, is a separate corporation. The Auto Transit Company is operating three coach or bus lines—one between Kansas City and Excelsior Springs, a distance of about 30 miles; another between Kansas City and Parkville, a distance of about 10 miles, and a third from Kansas City via Smithville and Gower to St. Joseph, Mo., a distance of about 60 miles.

SUMMARY OF RESULTS FROM OPERATION OF THE KANSAS CITY, CLAY COUNTY & ST. JOSPEH RAILWAY, 1924 AND 1925

	1925	1924
Railway operating revenue:		
Transportation revenue St. Joseph division	$676,076	$692,929
Transportation revenue Excelsior Springs division	190,121	277,130
	$866,197	$970,060
Other operating revenue St. Joseph division	5,936	5,665
Other operating revenue Excelsior Springs division	2,282	2,154
	$8,218	$7,820
Total operating revenue	$874,415	$977,880
Railway operating expense:		
Way and structures	$91,380	$85,569
Equipment	64,249	61,866
Power	108,313	114,906
Conducting transportation	196,259	211,144
Traffic	9,496	10,157
General and miscellaneous	128,849	128,887
*Depreciation	17,324	44,645
Taxes (except income taxes)	26,182	29,837
Total	$642,055	$687,014
Operating income	$232,360	$290,866
Non-operating income:		
Interest funded securities	2,579	5,105
Interest unfunded securities	7,765	6,328
Total	$10,344	$11,433
Gross income	$242,705	$302,299
Deductions from gross income:		
Interest	160,318	161,402
Miscellaneous	3,215	3,257
Total	$163,534	$164,659
Net income	$79,170	$137,639
Less estimated income taxes	.....	5,000
Balance available for surplus and dividends	$79,170	$132,639

The auditors have taken accrued depreciation less expenditures for renewals and replacements, $42,085 for 1924 and $17,324 for 1925, as appropriations of surplus—add these amounts and minor adjustments of $137 and $41 respectively, to check their surplus net income.

40-Mile Connecticut Interurban to Quit

The Hartford & Springfield Street Railway, Warehouse Point, Conn., has been granted permission by Judge Isaac Wolfe in the Superior Court to discontinue all railway service on its lines after June 25. At the present time the company is operating an electric service between Warehouse Point and Rockville and from Warehouse Point to Hartford. Saturdays the trolleys operate on a through schedule between Hartford and Springfield. This applies to lines on the east side of the Connecticut River. On the west side there is no railway service.

Recently the railway was acquired for $10,000 by Francis B. Cooley for the bondholders at a mortgage foreclosure sale. An effort has since been made to interest new capital and effect a suitable reorganization. These negotiations are still in progress, but difficulty arose when money was sought to repair the track and overhead lines and buy new rolling stock.

Buses have been operated with success, and during the past year $100,000 was invested in this type of carrier. Inasmuch as it would cost $1,000 a mile to repair the overhead work and $30,000 to put the track in first-class condition, it was deemed advisable to adopt the bus exclusively. Moreover, it was much easier to induce new capital to promote bus transportation than to reclaime the railway.

The railway is said to have lost $10,000 during the last seven months of its operation. On the other hand the buses are said to have operated at a profit. The latter service has suffered somewhat recently through competition from the Interstate Buses Corporation and the New England Transportation Company.

H. B. Freeman, the receiver for the railway, has applied to the Connecticut Public Utilities Commission for permission to buy six additional buses to replace the trolley service.

I.T.S Men Make Record in Placing Stock

Bearing witness to the high standing of the Illinois Traction System in the communities which it serves, the 6,139 shares of 7 per cent preferred stock of the Illinois Power & Light Corporation, which controls the Illinois Traction, sold by employees of that company in a two weeks drive during May broke all records for stock selling campaigns thus far established by the company. Of the $600,000 of stock sold more than 50 per cent was placed for cash.

One of the features of the campaign, in which only about one-third of the company's employees participated, was that there was no accompanying advertising or publicity of any kind and that the sale was made by personal contact almost entirely.

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Surplus for Quarter Reported in Rochester

For the first time since the New York State Railways signed a service-at-cost contract with the city of Rochester, five years ago, a quarterly report of operations shows a surplus. The report of Charles R. Barnes, Railways Commissioner, for the quarter ended Jan. 31, 1926, reveals a surplus of $56,110. One month of operation under an increased fare is covered in the report as the rate was advanced in Rochester from 7 to 8 cents on Jan. 1.

The report shows a surplus of $61,689 from railway operations and a deficit of $5,578 in bus and trackless trolley operations. The balancing account as of Jan. 31 indicates an accumulated deficit of $311,665. As the amount of fare is determined by this balancing account, city and railway officials see no immediate possibility of any return to a lower fare in the city. According to the contract, the balancing account must show a surplus of $200,000 before a fare reduction is possible.

The total number of passengers carried, including transfer and others, for each of the three months of the quarter, was as follows:

	Railway System	Trackless Trolleys	Gasoline Buses
1925 November...	7,763,174	122,700	27,780
1925 December....	8,546,717	128,999	33,741
1926 January.....	8,365,374	126,936	35,725
Total.....	24,675,265	378,635	97,246

The total number of passengers carried during the quarter on all lines operated under the service-at-cost contract, was 25,151,146.

A summary of the surplus or deficit account for the quarter follows:

	Railway Lines	Bus Lines	Total
1925 November.....	$10,959.77 deficit	$1,776.45 deficit	$12,736.22 deficit
1925 December.....	19,553.95 surplus	2,334.56 deficit	17,219.39 surplus
1926 January.....	53,095.04 surplus	1,467.75 deficit	51,627.29 surplus
Totals.....	$61,689.22 surplus	$5,578.76 deficit	$56,110.46 surplus

A comparison of passenger revenues and revenue passengers, Railway City Lines, for the month of Januarv, 1926, under the 8-cent fare, with January, 1925, under a 7-cent fare follows:

Passenger revenues, city lines, 1926.....	$477,681
Passenger revenues, city lines, 1925.....	452,858
Increase.....	$24,823
Per cent increase.....	5.48
The change from 7 cents to 8 cents is an increase of 14.29 per cent in fare.	
Revenue passengers, city lines, 1925.....	6,693,127
Revenue passengers, city line, 1926.....	6,199,224
Decrease in revenue passengers carried.	493,903
Per cent decrease.....	7.38
The surplus for railway lines, month of January, 1925, under 7 cent fare was..	$28,851
Month of January, 1926, under 8-cent fare was.....	53,095
An increase of.....	$24,243

This approximates the increase in passenger revenues. It is pointed out that the increase on the trolley lines for January, 1926 (8-cent fare) compared with same month in 1925 (7-cent fare) was only 5.48 per cent, while the increase in fare was 14.29 per cent. This indicated decrease in the number of passengers carried might be attributed to the increased fare. There were, however, other factors which were important in bringing about this condition.

Hopeful for Reorganized Road on Long Island

The story is no longer new of how a group of Queens business men, interested in seeing local trolley service maintained between the Rockaways and Jamaica, banded together to purchase the property of the defunct Long Island Traction Company and reorganize it and revive it as the Jamaica Central Railways, but Parke A. Rowley, vice-president of the Bank of Manhattan, in charge of its Jamaica branch, did give some facts at a hearing before Chairman John F. Gilchrist and Commissioner Leon G. Godley of the Transit Commission on June 8 that shed new light on the transaction.

The hearing was upon the application of the reorganized company for permission to issue 2,000 shares of nonpar value stock and to bond itself in the sum of $140,000 to meet the cost of the purchase of the road at receiver's sale, amounting to $115,000, and for working capital. The hearing was continued by Chairman Gilchrist to permit counsel for the railroad to furnish additional figures as to the valuation of the property.

Mr. Rowley is treasurer of the company. He testified that as a banker in Jamaica he had watched with interest previous attempts to reorganize the road that did not come to fruition. He said:

As a banker in Jamaica I was very much interested when persons came to me and told me that the continuation of the road, which operates between Jamaica and the Rockaways, was vital for the well being of a large number of persons living to the south of Jamaica. Many had bought homes along the line of the railroad. There were mortgages on some of these homes and it appeared that the owners of all of them were likely to be without any transit if the railroad stopped operation. That meant great suffering for those people; it meant a loss for those who held the mortgages on those homes.

So some of us got together, I think it was just the night before the sale of the property, and arranged to buy it in with the thought we might operate it and possibly make it pay if the greatest economy were used. So we arranged for the purchase of the property and were able to get it for $115,000, although we stood ready to bid up to $150,000. We plan to operate the road with the least overhead possible with good service. The officers have agreed not to take a cent from the treasury of the company in salaries until such time as the road is firmly on its feet. We have also stipulated among ourselves that every available cent that comes in shall be put back into the road.

We took over the operation of the road on April 5, and in that month we carried approximately 40 per cent more passengers than the road carried at this time last year.

New Director Chosen.—Philip Pond was recently elected a director of the New Haven & Shore Line Railway, New Haven, Conn., to succeed A. William Sperry.

Single Track Line Will Replace Double Track.—The New Jersey & Pennsylvania Traction Company, Trenton, N. J., has been granted permission to remove one of the double tracks on North Willow Street and to maintain a single track hereafter on that street.

Service Discontinued.—The Missouri Public Service Commission has entered an order authorizing the Southwest Missouri Railroad, Joplin, Mo., to discontinue its street car service from Duquesne to Duenwig in Jasper County. Three months ago the commission ordered the company to make two round-trips in the morning and in the evening for a trial period and the fare was increased from 15 to 20 cents. The record, however, showed operating losses.

Ohio Property Sold. — All property holdings of the Cleveland, Painesville & Ashtabula Electric Railway, Cleveland, Ohio, were sold for $75,000 at a receiver's sale conducted by Harry R. Collacott, chief master at the court house of Painesville, Ohio, on April 30. Frank M. Cobb Cleveland attorney, was the purchaser. The line, 24 miles long, connects at Painesville for Cleveland with the Cleveland, Painesville & Eastern Railroad, which controls it.

Vermont Roads Taken by Forshay Interests.—Interests owning the Burlington Traction Company, the Military Post Street Railway and the Vergennes Electric Company, Burlington, Vt., have announced the sale of these properties to the W. B. Forshay Company, New York. It is understood that these properties will be consolidated into one company, known as the People's Vermont Hydro-Electric Company, which in turn will be owned by the People's Light & Power Corporation, recently organized by the W. B. Forshay Company to take over, manage and operate its utilities.

Another Participation Distribution.—The voting trustees and board of directors of New York Railways Participation Corporation, New York City, have declared a second distribution on account of its assets. This distribution will be made as of July 7, 1926, and will be made in cash at the rate of $200 for each share of the stock of the Participation Corporation held.

Valuation Argument Before Court of Appeals.—The Court of Appeals of Maryland at Annapolis on June 9 heard arguments in the case involving the valuation of the property of the United Railways & Electric Company, Baltimore, by the Public Service Commission. The commission fixed $77,000,000 as the valuation of the property and in this amount was a $7,000,000 item for easements. Clarence W. Miles, who at the time of the hearing was people's counsel, opposed including any valuation for easements and took the case to the Circuit Court of Baltimore, where the Public Service Commission was upheld. The appeal to the Court of Appeals followed.

Manhattan Railway Squaring Back Dividends.—A divident of $1.48 a share on account of accumulated dividends and the regular quarterly dividend of $1.25 a share on the modified guaranteed stock of the Manhattan Railway,

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New York, will be paid on July 1 to holders of record June 15. The back dividend represents 50 cents a share on account of dividends deferred because of insufficient earnings for the quarter ended Oct. 1, 1925, and of 98 cents a share for the quarter ended Jan. 1, 1926. The 50-cent payment makes up the $5 rental for the year 1925 and the 98 cents makes up the full dividend for the Jan. 1 quarter of this year when a disbursement of only 27 cents a share was made. The dividend is a charge against the earnings of the Interborough Rapid Transit Company, by which the elevated lines are operated under lease.

Fall in Net Income.—For the ten months period ended April 30, 1926, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $9,434,013 and $9,415,703 for the ten months period ended April 30, 1925. After the consideration of income deductions the net corporate income for the ten months period ended April 30, 1926, was $1,168,801 and $1,216,667 for the ten months period ended April 30, 1925.

Change of Name Allowed.—The Danbury & Bethel Traction Company, formerly the Danbury & Bethel Street Railway, Danbury, Conn., has been authorized by the Public Utilities Commission to change its name to the Danbury Power & Transportation Company. The company plans to issue 2,000 shares of common stock of no par value, instead of the $300,000 issue of 6 per cent preferred stock. With this change in effect the capital stock of the company will be $500,000 of 6 per cent first mortgage bonds and 5,000 shares of stock without stated par value.

Gross Corporate Income $338,996.—The San Diego & Arizona Railway, San Diego, reports to the California Railroad Commission its 1925 operating revenue at $1,361,149, compared with $1,338,061 for 1924. The operating expenses, excluding taxes, for 1925 are reported at $1,041,206 and at $999,871 for 1924, leaving net operating revenue of $319,942 for 1925 and $338,189 for 1924. During 1925 taxes charged to operation amounted to $84,633 and for 1924 to $80,176. Deducting the taxes leaves operating income of $235,309 for 1925 and $258,013 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income of $338,996 for 1925 and $342,102 for 1924.

Earnings and Traffic Increase in May.—Fewer persons used the street cars in May than the average four-year period figure of 584,922 passengers, but the operation of auxiliary bus service enabled the Madison Railways, Madison, Wis., to show another increase in earnings and passengers carried by the railway and bus systems that month. Passengers carried during May by both systems numbered 514,395, compared with 481,460 during the corresponding month of last year. In May, 1926, 469,324 passengers were carried by the street cars. Gross earnings of the cars and buses during May were $34,949, compared with $33,840 in May of last year. Of the total May earnings $31,553 was earned by the railway line, against $31,494 for the corresponding month of last year.

Personal Items

Thomas Pumfrey New Chief Engineer at Portland

Thomas Pumfrey, appointed chief engineer of the Portland Electric Power Company, Portland, Ore., will be in entire charge of maintenance of way and equipment for the city lines, buses and interurban lines. For sixteen years now the new chief engineer has had charge of the maintenance of way department, with supervision over construction and maintenance of tracks, roadways, bridges, buildings and all engineering and drafting work. In addition to those previous duties he will now have entire charge of all rolling stock.

Before he became connected with the

Thomas Pumfrey

Portland Electric Power Company Mr. Pumfrey served as chief engineer of the International Railway, Buffalo, N. Y., from 1899 to 1910. So in a period of more than 25 years Mr. Pumfrey has been connected with only two companies. But that has been a period rich with experience. He started with the International Railway just before the Pan-American Exposition and he did his bit under Thomas E. Mitten in helping to put the Buffalo property in good physical condition to handle the exposition crowds. There he served first as acting engineer of way for the company's Buffalo lines, but it was only a short time before the responsibility was made his for caring for this work on the entire system. This was no mean job considering the extent of the system at Buffalo and the diversity of service furnished, but it supplied him with a wealth of experience which he was able to apply to his work at Portland, where the railway system was somewhat similar in extent and character to that at Buffalo.

It was in August, 1910, that Mr. Pumfrey went to Oregon. His first title there was engineer of maintenance of way. At the outset the extent of his activities was circumscribed to the duties that are generally accepted as coming under that title, but as time went on the field of his operations was widened and his appointment as chief engineer was a formal recognition not only of the loyal service of the man but of his capacity for work and his engineering talent.

J. W. Carpenter Heads Dallas Railway

John W. Carpenter was elected president of the Dallas Railway, Dallas, Tex., at a meeting of the board of directors on June 12. The position of president has been vacant for some time.

C. W. Hobson resigned as chairman of the board of the railway and his resignation was accepted. He explained that since the General Electric Company has disposed of its stock in the local concern, he, as the Southwestern manager of the larger company, did not need to continue as a railway executive.

Richard Meriwether, who has been general manager of the Dallas Railway since its organization in 1917, will continue to serve in that capacity and as vice-president.

No change in the operating organization under Mr. Meriwether's management is contemplated. Mr. Carpenter's endeavor will be directed to the company's affairs to the end that the city of Dallas may have the best possible transportation service. His responsibilities as vice-president and general manager of the Texas Power & Light Company will not be affected by being identified with the Dallas Railway.

J. E. Allbritton was recently appointed assistant instructor of the transportation department of the Birmingham Electric Company, Birmingham, Ala., to co-operate with C. L. Luker, chief instructor, in training new men for train service and in improving the quality of the work of men already in the service. Mr. Allbritton has been associated with the Birmingham company since 1908.

R. L. Leach, formerly assistant superintendent of distribution of the Georgia Railway & Power Company, Atlanta, Ga., has been promoted to general stores keeper to succeed E. L. Fariss, resigned. Mr. Leach joined the forces of the Georgia company fifteen years ago. In 1916 he was transferred to the distribution department, where he became chief clerk and later assistant to the superintendent. Early this year he was transferred to the stores department.

E. L. Austin, formerly an official of the Philadelphia Rapid Transit Company, Philadelphia, Pa., was appointed director in chief of the Sesqui Exposition, Philadelphia, on June 15 to succeed the late Capt. Asher C. Baker. The appointment was made by Mayor Kendrick and will be sent to the board of directors of the Sesqui on June 21 for confirmation. Mr. Austin was formerly business manager. He was appointed comptroller of the Sesqui last June.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Mack Is Optimistic for Summer Months

Sale of Mack buses to traction companies during the past few weeks has been quite active, according to officials of the International Motor Company. It is the opinion of these officials that the summer season will see a considerable increase over the number of buses sold to electric railways as compared with similar business last year. The following sales were made to traction companies recently:

Public Service Transportation Company, New Jersey	5
Pittsburgh Motor Coach Company (Pittsburgh Railways)	4
Conestoga Transportation Company, (Conestoga Traction Company)	2
North Branch Bus Company (Lehigh Traction Company)	8

Bids Wanted for 100 Buses for Buffalo

Bids for the purchase of 100 buses will be asked by the city of Buffalo, N. Y., as soon as the specifications are prepared. The City Council voted unanimously to authorize Mayor Frank X. Schwab to advertise for bids after the Mayor issued an order declaring a transportation emergency exists in Buffalo due to the alleged failure of the International Railway to provide adequate service on its local lines.

The City Council also authorized the corporation counsel to inform the Public Service Commission and the International Railway that the Mayor and the Council would not be responsible for deaths or injuries resulting from the condition of the rolling stock and trackage of the International Railway.

The action of the municipal authorities was taken in spite of the adverse decision of the city law department that the City Council is without authority to own and operate bus lines in the city, but in unanimously adopting the resolution the Mayor and members of the City Council indicated they hoped to bring the question squarely before the courts.

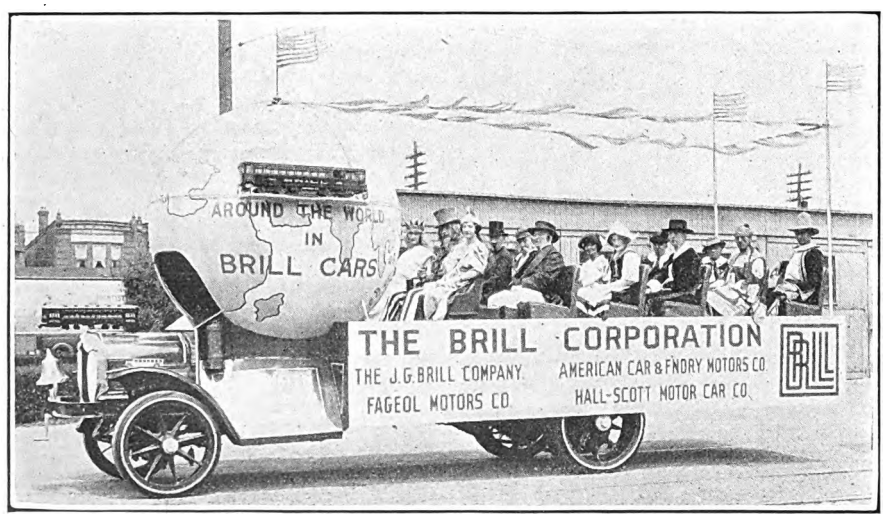
E. M. Herr Comments on Westinghouse Prospects

At the annual meeting of stockholders held recently in the main works of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., E. M. Herr, president of the company, stated that business would probably maintain a satisfactory level during the ensuing year. He went on to say:

> Business on the whole is rather better than was expected and is on the same basis as last year. Our company has maintained a level volume and now has a satisfactory load for its facilities. Due to seasonal conditions, we may expect a slight decrease in business during the summer months. Crop conditions in the fall will determine, to a certain degree, business conditions at that time. If crops are small business will probably be at a lower level, although there will not be a large decrease even under adverse conditions.

At the meeting the following directors, whose terms had expired, were re-elected: F. A. Merrick, vice-president and general manager Westinghouse Electric & Manufacturing Company; R. B. Mellon, president Mellon National Bank, Pittsburgh, Pa.; George M. Gerity, president American Rolling Mill Company, Middletown, Ohio; Jerome J. Hanauer of Kuhn, Loeb & Company, New York, N. Y.

J. G. Brill Enters Picturesque Float in Philadelphia Pageant



AN INTERESTING feature of the industrial pageant held in Philadelphia, Pa., on June 3 in honor of the Sesqui-Centennial celebration was a float of the J. G. Brill Company. Uncle Sam manually controlled the car moving around the world, and he was at the same time in a motorman's position on the "car" behind the world, thus expressing the thought that he led the representatives of the different countries. These representatives, riding on the body of the float, were seated on Brill seats.

Yellow Coach to Increase Capital Stock—G.M. Absorb Fisher Body

The organization of a new $30,000,000 transportation enterprise by the Yellow Truck & Coach Manufacturing Company and backed by the General Motors Corporation, of which it is a subsidiary, was made public on June 8 by John D. Hertz, chairman of the board. In this connection it is proposed to increase the capital stock of the Yellow Truck & Coach Manufacturing Company to provide $14,000,000, of which $10,000,000 is to be made immediately available for the new enterprise. It is interesting to note that this is the first time that General Motors interests have engaged in the business of operating transportation. The new company is known as the Hertz Drivurself Corporation and will act as a holding company, controlling state and local Drivurself companies throughout the United States.

In addition to this new enterprise it was voted at a special meeting of stockholders of the Fisher Body Corporation to dissolve the corporation and to sell to the General Motors Corporation all of the assets of the Fisher Body Corporation, taking in payment 1,600,000 shares of common stock of the General Motors Corporation. Upon dissolution of the Fisher Body Corporation, this General Motors common stock will be distributed to stockholders of the Fisher Body Corporation on the basis of one share of General Motors for each 1½ shares of Fisher Body.

Haskelite Is Standard on Chicago Surface Lines

Haskelite was specified for the roofs, bulkheads and corner linings of the 100 new cars recently ordered by the Chicago Surface Lines, Chicago, Ill. Other principal specifications on these cars were published in the issue of the ELECTRIC RAILWAY JOURNAL for May 22. Haskelite has been specified as standard on the Chicago Surface Lines for the past four years.

Switching Electric Locomotives for the New York Central

Delivery was recently made to the New York Central Railroad of seven 600-volt 100-ton switch engines for use in switching service on the electrified portions of the line between Harmon and New York. These locomotives were built by the American Locomotive Company and the electrical apparatus supplied by the General Electric Company.

The electric equipment consists of four GE-286-A motors, with 72-17 gearing. P.C.L. three-speed control is provided, with eleven, seven and eight steps, and two reduced field running steps on each full field connection. The platforms on the locomotives are made

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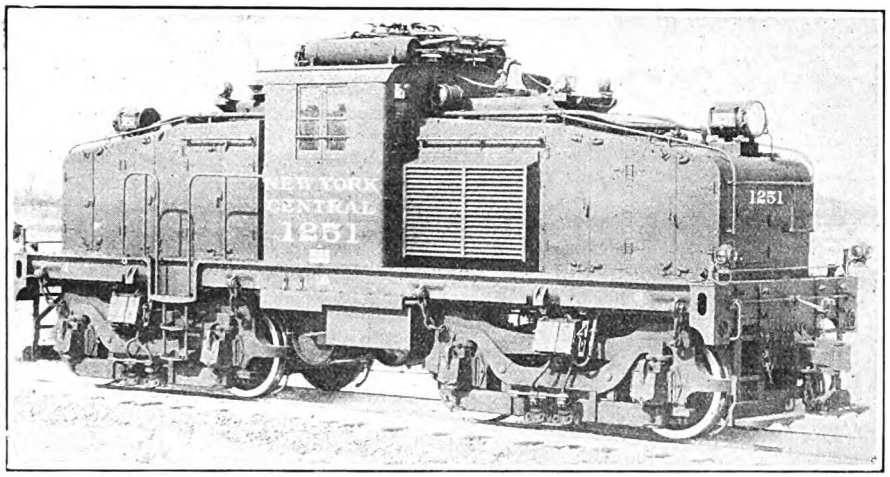


Exterior View of 100-Ton Switching Electric Locomotive for New York Central

ACCEPTANCE TESTS OF CLASS Q ELECTRIC LOCOMOTIVES

Equipped with 4 G. E. 286-A Motors

	Run No. 1	Run No. 2	Run No. 3	Run No. 4
Date	April 18, 1926	April 18, 1926	April 18, 1926	April 18, 1926
Extent of run	Harmon to Marble Hill	Marble Hill to Harmon	Harmon to Marble Hill	Marble Hill to Harmon
Locomotive No.	1250	1250	1250	1250
Number of cars	54 (37 empty, 14 loaded, 3 cabooses)	54 (37 empty, 14 loaded, 3 cabooses)	53 (37 empty, 13 loaded, 3 cabooses)	53 (37 empty, 13 loaded, 3 cabooses)
Weight of cars, tons	1,474	1,474	1,438	1,438
Weight of locomotive	100	100	100	100
Weight of train	1,574	1,574	1,538	1,538
Number of stops	5	5	5	5
Total length of stops	12'-9"	11'-28"	12'-1"	14'-41"
Elapsed time	1-22'-25"	1-14'-37"	1-14'-25"	1-17'-18"
Maximum speeds, m.p.h.	28-32.4	28.3-30.7	29.5-33.5	26.2-30.9
Voltage for above speeds	605-640	580-645	550-690	500-680
Watt-hours per trailing ton-mile	29.5	26.7	25	25.4
Exploring Coil Temperatures				
Motor armature	1 C.	2 C.	3 C.	4 C.
Temperature at end of run				
Motor No. 1	94 C.	97 C.	96 C.	95 C.
Motor No. 2	92.5 C.	88 C.	94 C.	90 C.
Air temperature	9 C.	8 C.	10 C.	10 C.

by the Commonwealth Steel Company. The motors have a continuous rating of 430 amp. and the hourly rating is 460 amp. Fifteen-hundred-volt insulation is provided on the contactors and motors.

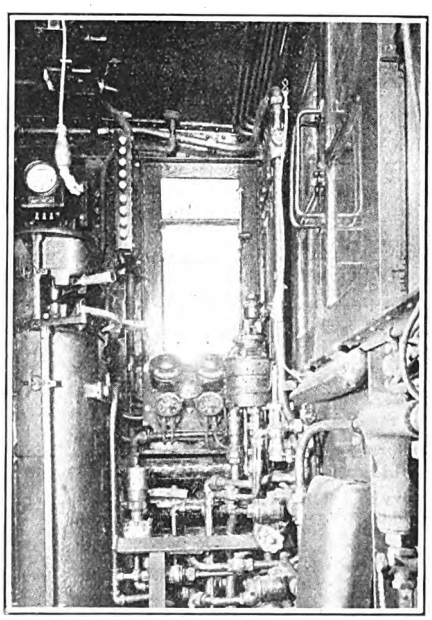
The locomotives are capable of hauling a 1,500-ton train at 25 m.p.h., at an average voltage of 575. It is expected that the locomotives can do better than 25 m.p.h. over the profile of the New York Central electrified division. The new locomotives are provided with both overhead and third-rail collectors.

For the purpose of checking the heating of the motors, four acceptance test runs were made on April 18, 1926, between Harmon and Marble Hill. The weight of the test train was approximately 1,500 tons and was made up of 37 empty and seventeen loaded cars. Five two-minute intermediate stops were made with a layover at each end of each run of seventeen minutes. The length of each run was 23.5 miles. Indicating and recording instruments were installed on a caboose attached to the locomotive to obtain speed, voltage, current temperature of motors and kilowatt-hours, etc. The results of these runs showed the locomotive well within the specified requirements.

The more important characteristics of these switching electric locomotives will be found in an accompanying table.

In addition to the switching locomotives, which have just been delivered, ten passenger electric locomotives are in process of construction as well as two 170-ton road freight electric locomotives. The passenger locomotives will be of a type similar to those in operation on the New York Central Lines.

Type.....Double truck, four 44-in. wheels
Length over coupler faces.....38 ft.
Truck center .....20 ft.
Total wheelbase .....28 ft. 3 in.
Total weight .....100 tons
Weight on drivers .....100 tons
Horsepower per locomotive 1,330
Motors..Four GE-286-A 660-volt multipolar geared
Gear ratio .....4.235; gear, 72; pinion, 17
Capacity.....1,500 tons on 575 volts
Speed:
Design 25 m.p.h. with 1,500 tons trailing load.
Test 35 m.p.h. with 1,500 tons trailing load..
Safe operating speed (light).....40 m.p.h.
Acceleration.....0.18 m.p.h.p.s.
Tractive effort with 20 per cent adhesion 40,000 lb. per locomotive.
Watt-hours per ton-mile—25 to 29.5 on four test runs.



Control Apparatus in Locomotive

Yellow Sales Total 30 Buses to Electric Railways During May

The following sales of bus equipment to electric railway properties are reported for the month of May by the Yellow Truck & Coach Manufacturing Company, Chicago, Ill.:

Connecticut Company, New Haven, Conn., five Z-29-passenger city service coaches.

Dominion Power & Transmission Company, Hamilton, Ont., Canada, nine X-21 city service chassis.

Michigan Electric Railways, Jackson, Mich., two X-21-passenger city service coaches.

Wisconsin Public Service Company., Milwaukee, Wis., one X-21-passenger city service coach.

Chicago, Aurora & Elgin Railroad, Aurora, Ill., one "Y" parlor coach.

Springfield Street Railway, Springfield, Mass., two Z-29-passenger city service coaches.

San Antonio Public Service Company, San Antonio, Tex., seven X-21-passenger city service coaches.

Colorado Springs & Interurban Railway, Colorado Springs, Col., three "X" parlor coaches.

Ohio Brass Issues Rail Poster

An instruction poster describing the difference between the steel metallic and copper metallic arc welding processes and illustrating the proper method of applying the Titon and AW-12 arc weld bonds has just been published by the Ohio Brass Company, Mansfield, Ohio. The poster is intended as a guide for welders responsible for the installation of rail bonds. Copies are available without cost and will be mailed upon request to the company.

General Tire Gets Cincinnati Contract

The largest contract for automobile tires ever placed in Cincinnati, Ohio, has been awarded by the Cincinnati Street Railway for its motor buses. The contract is for two years and the total amount in money exceeds $250,000. The contract was awarded to the General Tire Company, Akron, Ohio, through the firm of Sohngen & Bischoff, its Cincinnati representative. It was estimated that approximately 3,000 tires would be used. The size of the tires is 34 in. x 7 in. on the six-wheel buses and 36 in. x 6 in. on the four-wheel buses.

Westinghouse Officials Move to New York

Further steps in the reallocation of the Westinghouse Electric & Manufacturing Company's sales department, under the recently announced reorgan-

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ization plan, have been taken with the transfer of three officials of this department from Pittsburgh to New York City. The officials are Myles B. Lambert, transportation sales manager; E. H. Froebel, central station sales manager, and Bernard Lester, industrial sales manager.

Rolling Stock

Arkansas Central Power Company, Little Rock, Ark., has received six of its order of 30 cars from the American Car Company, St. Louis, Mo. These are single-entrance safety cars with an over-all length of 28 ft. 6½ in. The other cars are in the paint shop and delivery will be made shortly.

Morris County Traction Company, Morristown, N. J., has received five street car type buses during the period from May 15 to May 31. These buses were purchased from the Fageol Company of Kent, Ohio.

San Francisco, Cal.—Bids for fifteen new Municipal railway cars will be called for by the Board of Works within a short time. This action follows the appropriation of $255,000 for this purpose by the finance committee of the Board of Supervisors.

Butte Electric Railway, Butte, Mont., has received one six-cylinder street car type bus from the Fageol Motors Company of California.

Los Angeles Motor Bus Company, Los Angeles, Cal., a subsidiary of the Los Angeles Railway and the Pacific Electric Railway Companies, received delivery in May of two double-deck Fageol buses from the Fageol Motors Company, Oakland, Cal. They were equipped with Westinghouse air brakes.

Track and Line

Connecticut Company, New Haven, Conn., is planning to start work soon on laying double track for its line on Forbes Avenue, New Haven.

San Francisco, Cal.—Contract for the 4,232-ft. Duboce rapid transit tunnel, to open the Sunset District for more rapid residential development, has been signed. The estimated cost is $1,650,000. It is proposed to have cars of the Market Street Railway operating through the tunnel within fifteen months, reducing the time of travel from the Pacific Ocean beach terminal to the San Francisco ferry building from five to 39 minutes over this route. Traffic intensity will determine the degree of reduction.

Evanston Railway, Evanston, Ill., will soon undertake the extension of its Central Street line from Lincolnwood Drive to Ridge Road, a distance of approximately ¾ mile. The thoroughfare is unimproved, but the company will pave the width of its single track with asphalt. All materials for construction are on hand.

United Railways & Electric Company, Baltimore, Md., and the city of Baltimore will share the expense of relocating car tracks on streets that are to be widened in acordance with an agreement ratified by the City Council. It is planned to shift the car tracks to the center of a number of the streets that are to be widened. The agreement was drawn some time ago and was approved by the Board of Estimate. Then it was submitted to the City Council for ratification.

Piedmont & Northern Railway, Charlotte, N. C., will spend $75,000 on a track expansion project on South Mint Street. The laying of 4 miles of additional track and the construction of an automobile unloading platform will make up the improvement program.

Cincinnati, Ohio.—An ordinance to amend the electric railway franchise and to accelerate the track construction program of the Cincinnati Street Railway has been introduced in the City Council. The measure allows the railway $400,000 additional in 1926 and reduces the sum it may spend in later years on track repair work. The franchise requires the railway to spend $1,750,000 in track rebuilding over a four-year period.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has announced a city-wide track reconstruction program which will cost more than $1,000,000. Reconstruction of the track zone on East Water Street, costing approximately $55,000, is practically completed. New rails and paving of the track zone costing $15,000 will take place on Layton Boulevard. This work is being done in connection with the city's plan to eliminate the raised parkway in the center of the boulevard. When this is completed work will be switched to the extension of the Center Street double-track line, costing $45,000. Other major track improvements outlined in the program for completion this summer approximate $300,000. Suburban lines also will come in for their share of improvements. To provide transportation for the rapidly growing district of Whitefish Bay, served by the Oakland-Delaware line, new tracks will be laid on Washington Avenue. This work will cost $13,000.

ELECTRIC RAILWAY MATERIAL PRICES—June 15, 1926

Metals—New York

Copper, electrolytic, cents per lb.	14.025
Lead, cents per lb.	8.20
Nickel, cents per lb.	35 00
Zinc, cents per lb.	7 57
Tin, Straits, cents per lb.	61 125
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Commercial grade	54 00
General service	30.50

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.325
Somerset mine run, Boston	1 875
Pittsburgh mine run, Pittsburgh	1.75
Franklin, Ill., screenings, Chicago	1.80
Central, Ill., screenings, Chicago	1 75
Kansas screenings, Kansas City	2.425

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.90
Tie plates (flat type), cents per lb.	2.35
Angle bars, cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.25
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8 ft.	$1.35

Hardware—Pittsburgh

Wire nails, base per keg	2.65
Sheet iron (28 gage), cents per lb.	3.10
Sheet iron, galvanized (28 gage), cents per lb.	4.30
Galvanized barbed wire, cents per lb.	3.35
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	12-18
Waste, cotton (100 lb. bale), cents per lb.:	
White	13-17.50
Colored	10-14

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), cents per lb.	11.85
White lead in oil (100 lb. keg), cents per lb.	15.00
Turpentine (bbl. lots), per gal.	$0.89
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4-6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire, cents per lb.	16.00
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 5 in. New York—Grade 1, per thousand	$147
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.70
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3x8½x4 N.Y., per 1,000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., f.o.b. N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.50
Light copper, cents per lb.	9 75
Heavy brass, cents per lb.	7 125
Zinc, old scrap, cents per lb.	4 25
Lead, cents per lb. (heavy)	7 25
Steel car axles, Chicago, net ton	$17 25
Cast iron car wheels, Chicago, gross ton	15 25
Rails (short), Chicago, gross ton	16 25
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	6.75

Trade Notes

Gibb Welding Machines Company, Bay City, Mich., manufacturer of electric arc, spot and seam welders, broke ground June 10 for an addition to its factory that will more than double its present floor space.

Maurice N. Trainer, has resigned as representative of the eastern district of the sales department of the American Brake Shoe & Foundry Company, headquarters New York office, and has been elected vice-president of the American Malleables Company with headquarters at Lancaster, N. Y. The American Malleables Company is a subsidiary of the American Brake Shoe & Foundry Company.

New Advertising Literature

The Spicer Manufacturing Corporation, South Plainfield, N. J., has issued a price list on Spicer parts for the type M cushioned coupling.

Okonite Company, Passaic, N. J., has issued a series of leaflets stressing the advantages to be obtained from the use of Okocord, Manson tape, Dundee A friction tape, Dundee B friction tape, Okonite tape and Okonite cement. Copies of these leaflets, which are prepared in a very interesting fashion, are available to all who may desire them and will be mailed upon request by the Okonite Company.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, *Editor*

JUN 28 1926
LIBRARY

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Now that the Car Engineers Have Reported, What Will the Industry Do?

FOLLOWING an exhaustive study of the electric railway car situation the engineers forming the committee on essential features of modern cars have presented their report. A comprehensive digest is published in this issue. The time of these three engineers was donated to the industry by the respective manufacturing companies which they represent. They were appointed to their task after a series of meetings of interested manufacturers and railway executives, for the purpose of stimulating development of the electric car. The plan received the formal approval of the American Electric Railway Association executive committee and the engineers have worked under the chairmanship of G. C. Hecker, special engineer of the association, in close contact with Managing Director Storrs.

In its study the committee sought advice and counsel wherever it was available. It co-operated closely with the committee on unification of car design and its findings reflect the operators' views as well as those of the manufacturers. The report has been accepted by a group of manufacturer executives acting under the chairmanship of Mr. Storrs. Present plans contemplate printing the report in full and distributing it to all operating companies and interested manufacturers.

What will be the result? Will this constructive piece of work take its place along with countless other recommendations of association committees which gather dust while operating officials blithely continue to gratify their personal whims in demanding special requirements that add heavy cost to electric railway equipment? Or will it bring about realization of the necessity for creating a market for cars of the types recommended so that car building can be put on a manufacturing basis with a consequent saving in cost of cars? Will those responsible for the executive control of operating properties accept this as a "fine report" and then forget it, or will they hold conferences of their operating and mechanical officials and demand to know why its recommendations should not be followed? If they disagree with the recommendations will they throw the report aside and continue to point to the high cost of new cars as the reason for continuing to operate the 25,000 obsolete cars that give electric railways a "down at the heels" aspect in the minds of the public, or will they understand and appreciate its intent and spirit to the extent of writing out their objections and forwarding them to the association?

But the report will also go to manufacturers—car builders, equipment manufacturers and others. What will they do? Will they grasp the opportunity thus afforded to put car building on a manufacturing instead of a contracting basis? Are they prepared to accept the responsibility of assuming the initiative in improving the electric car? Are they ready to come before the industry with cars that reflect their individual enterprise provided a market is reasonably assured?

Is the electric railway industry ready to accept the challenge of the automobile? Has it the necessary faith in the possibilities of the electric car? Has it the ingenuity and courage necessary so to improve the character and attractiveness of common carrier vehicles as to win back many of those who are becoming tired of the expense and the traffic difficulty experienced in providing individual transportation? Are both manufacturers and operators alert to the opportunity for getting together for the good of the industry as pointed out in the report?

The work of the committee will have been in vain unless its report results in action. It does not contemplate a standard car. It does not limit progress and development by the manufacturers. It merely attempts to bring about some agreement as to the general types, sizes and weights of cars suitable to average city and interurban conditions. The report affords a basis for agreement between operators and manufacturers as to the general features of design, which would assure the latter a market to justify them in taking the initiative in development.

NOW is a critical period for the electric car in street and interurban service. The action—or the lack of it—following this report will determine whether operators and manufacturers have the vision and courage to grasp the present opportunity. The committee suggests a questionnaire to determine how many operating companies would adhere to its recommendations in buying cars. That would help in determining the extent of the market available. But there is another way of bringing about constructive action. The mechanism is already set up in the Advisory Council. Its membership includes men who wield a strong influence over the buying policies of many properties. It has there the power to create a market for cars manufactured according to the committee's recommendations. It is also in a position to ask pointed questions of manufacturers who fail to carry out the spirit of the report. With a start of that kind competition and merchandising effort will assure progress.

The action of the industry at this time is the turning point for the street car. Either it will assume its proper place as an up-to-date common carrier vehicle or it will be crowded off the streets of many American cities due to the timidity, lack of vision or obstinacy of those interested in its operation and manufacture. These are strong words, but the occasion demands them.

What will the industry do?

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Prospects Appear Good for a New Deal in Tacoma

SOME time ago mention was made in ELECTRIC RAILWAY JOURNAL of the handicap under which the Tacoma Railway & Power Company had operated its railway lines during the periods of incumbency of Mayor Fawcett. That anachronism of American politics continued to play the single catgut in discord until the people of Tacoma turned him out of office. Meanwhile distressing damage had been done to the railway, but not damage that was irreparable. Things appear to be much better now in Tacoma. There is a new Mayor in the saddle and with him sits a new Council. Under this new Mayor, Melvin G. Tennent, conferences have been started with the end in view of restoring relations between the city and the company to a basis that should prove profitable to both.

Things have not yet gone very far in Tacoma under the new régime, but the negotiations have been opened under conditions that are auspicious. The fact seems now to be realized that the railway is no less worthy of its hire than is the individual and as a basis for fixing that hire a valuation is to be agreed upon and the company is to be permitted to earn at least 6 per cent on the valuation so reached, with fares, of course, on a basis that will permit that return to be earned. As one of the first indications of its willingness to help toward a settlement, the city has refused to renew operating permits to the Puget Sound Transportation Company, until recently a competitor of the railway. That in itself is very important. Moreover, it is more than a gesture, for the new Mayor appears to be fully cognizant of the harm that has been done in the past by just such so-called competition.

As for the railway, Manager Sullivan expressed a hope that the city might find a solution of its transportation problem so good and so advanced that it would set a pace for cities faced with similar problems. He declared that the system must be ready to give the city 24-hour service 365 days a year, but said that some of the problems of service are beyond human power to determine in advance of application and that a period of experimentation is essential. In this he is absolutely correct. The city needs not only to try to be fair to the company but to be patient with it as well. Of course it is too early to attempt to predict the possible outcome of the present negotiations, but the spirit evident in the first session may be regarded as auguring well for the railway and the city to reach some settlement of the problem.

Sane Transit Advice from Wall Street

UNCANNY understanding of the problems of the electric railways is shown in a recent editorial in the *Wall Street Journal*. It might be expected that that paper would be well informed on questions of finance connected with electric railway operation, but it did come somewhat as a surprise to see it manifest such knowledge as it did of the city transportation problem as a whole in its recent discussion of the proposal of former Comptroller Craig to sell certain surface lines to the city. Its discussion was of a subject of prime interest to New York, but the observations are equally applicable in most any community. On this account the comment is of general interest. One may or may not agree with its strictures regarding terms of the proposed sale of certain surface lines to the city, but surely that paper is on sane ground when it suggests as it did an engineering study on the public's behalf "of the advantages of buses compared, not with antiquated surface cars now feebly operated but with modern electric cars adequately maintained and competently run."

But New York City has done many stupid things transit-wise in the past. It would appear that it is likely to do them again despite all the warnings. If it had not in the past done some stupid things, the roads in the city now sore beset would not be in their present plight. True, there may have been traction manipulations in the past, but the local roads have more than atoned for any sins of earlier days. The onus for their present condition is not altogether theirs. It is largely the city's. In short, it is one thing to make a mistake. It is another thing to keep on repeating that mistake. The unfortunate thing is that New York City keeps repeating its transit mistakes. It keeps on repeating its mistake because for a long time past the railways have been made a political football. Why should there be any display on the part of the city of a willingness to entertain proposals for bus operation based on acceptance of a 10-cent fare while the avowed attitude is to deny a similar rate to the railways? Not until there arises in public office a man big enough to put the best interest of the city above the matter of his own political aggrandizement will the issue be settled.

The situation in New York is too complicated to say just what will come out of it, but it will indeed be most unfortunate if anything importunate is done before the railways have a chance to demonstrate what can be done with the roads worked as the *Wall Street Journal* would have them operated. It would seem that there are examples enough throughout the country for New York to study to prove that the *Wall Street Journal* is right. Yes, New York may be in need of buses. But more than that does it need modern electric cars adequately maintained and competently run. And that means a policy consistently as fair toward one mode of transportation as it is to another. Is that beyond hope? If surface indications mean anything it appears to be. That is why the transportation policy of New York is a poor guide for the rest of the country.

Flexibility of the Bus in Theory and in Practice

IT IS the amateur student of traffic problems in particular against whom the *Wall Street Journal* and trained transportation men issue their words of warning. From time to time these amateurs bob up with the proposal that buses be substituted for street cars in order "to relieve congestion." The basis for such suggestions appears to be the idea that the bus is more flexible in operation than the street car. While this may be true in theory, the extent of its realization in actual practice is somewhat problematical. Moreover, flexibility itself really is of small value as a means of reducing congestion.

In theory it is possible for the bus to alter its course to pass around temporary obstructions, something which the street car cannot do, but it usually happens where traffic is dense that the bus is so closely wedged in among other vehicles that its freedom of motion is largely lost. Consequently it is subject to just about

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the same minor delays as the street car. Cross traffic at intersections has the same detrimental effect on its operation as on car operation.

Nor is there much to choose between a bus and a street car so far as the influence on the movement of other vehicles is concerned. The car stops on its tracks halting other vehicles behind it and immediately alongside it. The bus weaves in and out of the traffic to reach the curb to pick up and discharge its passengers, thereby interfering seriously with other vehicular movements. Careful study of traffic has shown conclusively that weaving in and out tends to produce congestion. Without some definite advantage one way or the other comparison of carrying capacity or effect on congestion of bus and car in the same character of service get nowhere.

The layman is prone to expect the bus to be successful in replacing the street car everywhere because in the past it has been successful in doing it on certain routes. Then, too, the thing which we lack always looks more attractive than the thing which we have. The interference to other traffic caused by street cars is a known quantity—that which would be caused by buses is only a vague possibility until the change is made. A change such as this should be made only after due investigation and deliberation, therefore, lest the last state of congestion be worse than the first.

The Railway Now Dons the Rôle of the Good Samaritan

IT IS indeed a dull week when the citizens of Philadelphia are not greeted with some service innovation on the part of the Philadelphia Rapid Transit Company. The most recent of these deals with the manner in which the company has undertaken to succor the hereditary foe of public transportation, the private automobile. Having taken over the local Yellow Cab Company some weeks ago the problem of caring for disabled taxis sprang into being. Realizing that it would be necessary to keep towing facilities on hand for this purpose it occurred to company officials that the towing trucks might well be made available for public use, thus providing an added duty for this equipment tending to greater economy. The manner in which a number of old cabs were remodeled for this service was recounted in the issue of ELECTRIC RAILWAY JOURNAL for June 12.

To adopt an attitude of studied indifference toward a source of profitable revenue such as this simply because it may prove to be a boon to the automobile owner ill befits the railway executive today. For this the railway has been able to reduce overhead in this particular department and has made a definite bid for improved good will by showing itself ready to cooperate with the public in every form of transportation, even though of a competitive nature. Towing service with fixed meter charges will quickly drive the pirate off the streets. At the same time no vast bulk of present car riders will desert the public transportation facilities for private automobiles simply on the strength of this new service.

The present towing service makes no bid for patronage from truck or bus, due to the excessive weight of the latter. But it would seem that the same plan might be expanded by railways operating large bus fleets, to embrace the heavier vehicles which have failed at the roadside. Even the best of buses break down now and then. Emergency equipment must be kept on hand for these exigencies that in many cases might be profitably placed at the call of the truck operator who is operating far from his own base and is without emergency equipment. For the automobile owner, at least, the idea of a standardized towing charge has much to commend it and it is safe to predict that the Philadelphia company will soon be faced with the necessity of providing enough supplementary equipment to cope with the growing demand.

As Others See Us

MOST electric railway men are agreed that the automobile has introduced new conditions in the transportation market which have completely upset old standards and old methods. As the result of the widespread use of private vehicles, common carrier transportation found itself faced with serious competition. The need for merchandising effort soon became obvious, and the subject of attracting riders to street cars has occupied a large part of the industry's attention.

The automobile manufacturers have more than demonstrated their genius both as engineers and salesmen. They have literally put America on wheels. Although street car riding has suffered, their efforts have resulted in building up an enormous increase in the total riding habit.

Viewing this situation in a broad way, some transportation men have seen new opportunities for increasing common carrier business. There is a growing conviction that this can be accomplished by making street car riding more attractive. The automotive reaction to present railway activity is reflected in a recent editorial in *Automotive Industries* under the heading "Selling the Street Car."

> With the constantly increasing popularity of the automobile and the motor bus making them more worried every year about future business, the electric railways in many cities are conducting active campaigns to sell the public on street car transportation.
>
> Positive, constructive sales effort on the part of the electric lines is not only natural, but entirely warranted under the circumstances. But when these efforts are tied up with an attempt to decrease the sale of automobiles they may fairly be criticised.
>
> Indianapolis street cars, for example, are carrying a sign, prominently displayed, which reads: "Why buy the car when you can buy a ride at a time on the street car?" The automotive industry has never gone out to suggest that people stop riding street cars, however strongly it has merchandised the desirability of its own products. Positive selling almost always turns out to be more profitable than negative selling.
>
> A good example of the positive brand of selling as applied to street railway transportation is to be found in Grand Rapids, where the railways are now attempting to get what they consider to be their just share of the business by placing at the disposal of the public a new type of street car which is designed as far as possible along automotive lines. The cars are advertised as "electric railway coaches," are finished in striking colors, have a skirt around the bottom to give a low-hung appearance, are fitted with vibration-damped trucks and wheels and silent gears to reduce noise, and the seats are of the individual chair type, arranged in pairs, to further increase the comfort of the passengers.
>
> This is constructive merchandising. If the street railways expect to maintain their place in the transportation picture they must proceed along the line of improving the general character of their equipment.

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New Light-Weight Equipment Pays

Lower Car Prices Are Possible

A.E.R.A. Committee on Essential Features of Modern Cars Submits Designs for City and Interurban Service—Elimination of Needless Variations in Dimensions Urged—Results with New Cars on a Number of Properties Show Big Return on the Investment

MANUFACTURING economies in the production of electric railway cars, with reflection in lower prices and reduced maintenance cost, are possible with reasonable unification of design. The great variety of designs in the past has prevented savings and any approach to quantity production. It is possible to eliminate the needless variations in dimensions, weight, and general arrangement of cars. Modern cars have been found to attract greater patronage and earn more revenue than those of obsolete design. These are the principal findings of the committee on essential features of modern cars of the American Electric Railway Association, which has been formed during the past year through the co-operation of the association and its manufacturer and operating members.

Following its studies, the committee submitted plans of a city car and an interurban car, showing how they may be adapted to meet conditions on practically any property without affecting the basic principles of the unification plan. Either car is planned so that it may be arranged for one-man, two-man, or one-man-two-man operation. Single-end or double-end operation is possible and the seating capacity may be adjusted to meet local conditions by designing the body with ten, eleven or twelve windows. Electric motors are standardized in three sizes, 25, 35 and 40 hp. The wheels recommended are of 26-in. diameter.

The drawings published herewith indicate that the dimensions included are general ones only. The proposed standardization will in no way limit manufacturers in developing a distinctive product. The cars may be equipped with any known specialties or safety devices. Ingenuity may be fully exercised in the design of structural details to reduce weight. Features which are intended to make the cars more attractive and add to the comfort and convenience of passengers are optional.

The second section of the report contains experience data on eight properties where modern light-weight cars have been installed. Operating and financial

Formation and Aims of the Committee on Essential Features of Modern Cars

DURING the annual convention of the American Electric Railway Association at Atlantic City last October a meeting of electric railway officials and manufacturers was held at the invitation of James H. McGraw to discuss the problem of replacing with modern equipment those cars which were built prior to developments in design tending toward attractiveness, comfort and light weight, as well as the inclusion of safety features. At this meeting it was decided to form a committee for the purpose of considering and reporting on ways and means of assisting electric railways in a general car replacement program. This committee worked out a plan which was approved by the executive committee of the American Electric Railway Association, and which was later presented to and approved at a meeting of manufacturers.

The principal features of the plan were: (1) Organization of an engineering committee representing car builders and equipment manufacturers, with the association's special engineer as chairman, to develop suitable car designs and to coordinate the efforts of the manufacturers in introducing uniformity in fundamental features. (2) Inauguration of a co-ordinated publicity and advertising effort on the part of the manufacturers to stimulate interest in the purchase of new cars. (3) Development of suitable arrangements for financing the purchase of cars through car trust certificates on terms which would make it possible to go forward with a general car replacement program. (4) Organization of an executive committee of manufacturers with Managing Director Lucius S. Storrs as director to supervise the activities of the engineering committee, and to carry out the other phases of the program.

The committee on essential features of modern cars was organized late in 1925 with the following membership: J. A. Brooks, chief engineer of the J. G. Brill Company, representing the car builders; C. A. Burleson, railway engineering department General Electric Company, representing electrical manufacturers; W. J. Clardy, engineering department Westinghouse Electric & Manufacturing Company, representing electrical manufacturers, and G. C. Hecker, special engineer American Electric Railway Association, chairman. This committee came to the conclusion that for the present, at least, its efforts should be directed toward the following important studies: (1) Selection of a series of modern cars, as few in number as possible considering the range of operating conditions to be encountered in both city and interurban service. (2) Presentation of data and information showing benefits derived on a number of properties as a result of introduction of modern rolling stock and modern methods of operation. (3) Analysis of the age of cars now in service.

The present report digested in this article consists of three parts, covering the topics outlined above.

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statistics show the savings that have been effected and the return on the investment from the purchase of new equipment. The gross return ranges from 13 to 65 per cent on the cost of the new equipment that has been installed. Some of the properties also show a gratifying gain in gross revenue, indicating that attractive new cars are an important factor in stimulating traffic.

A feature of this section of the report is a bibliography of articles on the advantages of new cars which have appeared in ELECTRIC RAILWAY JOURNAL and other industry publications during the past two years.

In the third section of the report is a wealth of data concerning the purchase of cars since 1907, including a summarized statement, based on returns from 66 per cent of the industry, and the age of equipment in service by five-year periods.

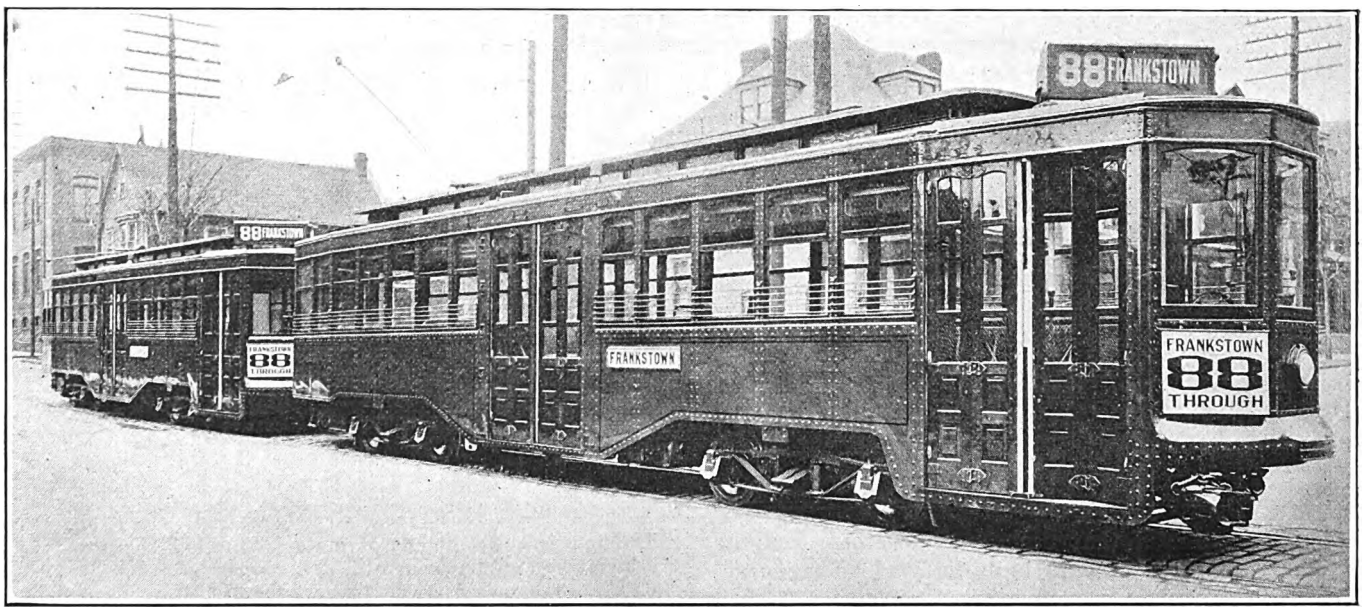
CAUSES OF HIGH COST OF CARS

Modernization of electric railway equipment has been prevented due to the high cost of new cars, uncertainty as to the ultimate effect of motor vehicle competition, financial difficulties, and many other causes. Developments of the past few years have proved conclusively the essentiality and permanence of electric railway transportation. The industry is recovering slowly but surely.

In the opinion of the committee, "perhaps more progress would have been made in modernizing equipment had the manufacturers adopted a more aggressive policy in developing, manufacturing and selling a complete product." The car builders have "waited until the railway companies were in the market for new equipment, and then they called to submit their bids on the specifications and plans submitted by the operating companies. None of the intensive sales methods so prevalent in other lines of business was in evidence in the car-building industry. Today, however, a change is taking place. A more progressive spirit is abroad among the manufacturers. New types of cars are being developed; new ideas advanced, and more aggressive sales methods initiated, all of which should materially hasten the modernization program of the electric railways."

Despite all the drawbacks, developments in car design and in car equipment tending toward lighter weight, greater efficiency, attractiveness and comfort have been marked during the past five years. Railways that have been able to take advantage of these developments have benefited greatly through operating economies and through increased traffic. High cost of new equipment, however, has prevented many companies from keeping pace with these developments. For this reason the committee had in mind in the selection of typical cars the importance of reducing the cost to the railway.

There is little possibility of reduction in material and labor costs. On the other hand, cars have been built in accordance with plans and specifications produced largely by the individual electric railway companies, with the result that scarcely any two lots of cars, even on the same property, are alike. Consequently, it has not been possible to take advantage of manufacturing economies incident to quantity production. The committee "is firmly convinced that substantial savings can be realized through general agreement on certain basic features of car design that will permit an approach to quantity production and the elimination of useless waste in the car-building industry. The possibility of effecting such savings lies entirely in voluntary co-operation on the part of both the electric railway companies and the manufacturers." The committee states that if its recommendations are to bear fruit, a co-operative movement must be organized for bringing about general agreement on, and adoption of, certain fundamental features of design. It is purely a problem in economics.



Modern Two-Car Multiple-Unit Train of the Pittsburgh Railways. This Is Typical of the Equipment Both for City and Interurban Service

At the outset, the committee was able to utilize the information gathered by the committee on unification of car design appointed by the American Electric Railway Engineering Association in 1921. In the five years that committee has been functioning it has collected and analyzed a vast amount of data on car design.

To develop further information on which to base fundamental dimensions, weight, and arrangement of a typical series of cars to meet average operating conditions for city and for interurban service, the new committee requested each car manufacturer to submit drawings and weights of light-weight, low-floor cars built in recent years. As a result of this request, data were received from nearly all the leading car builders. This information was studied by the committee.

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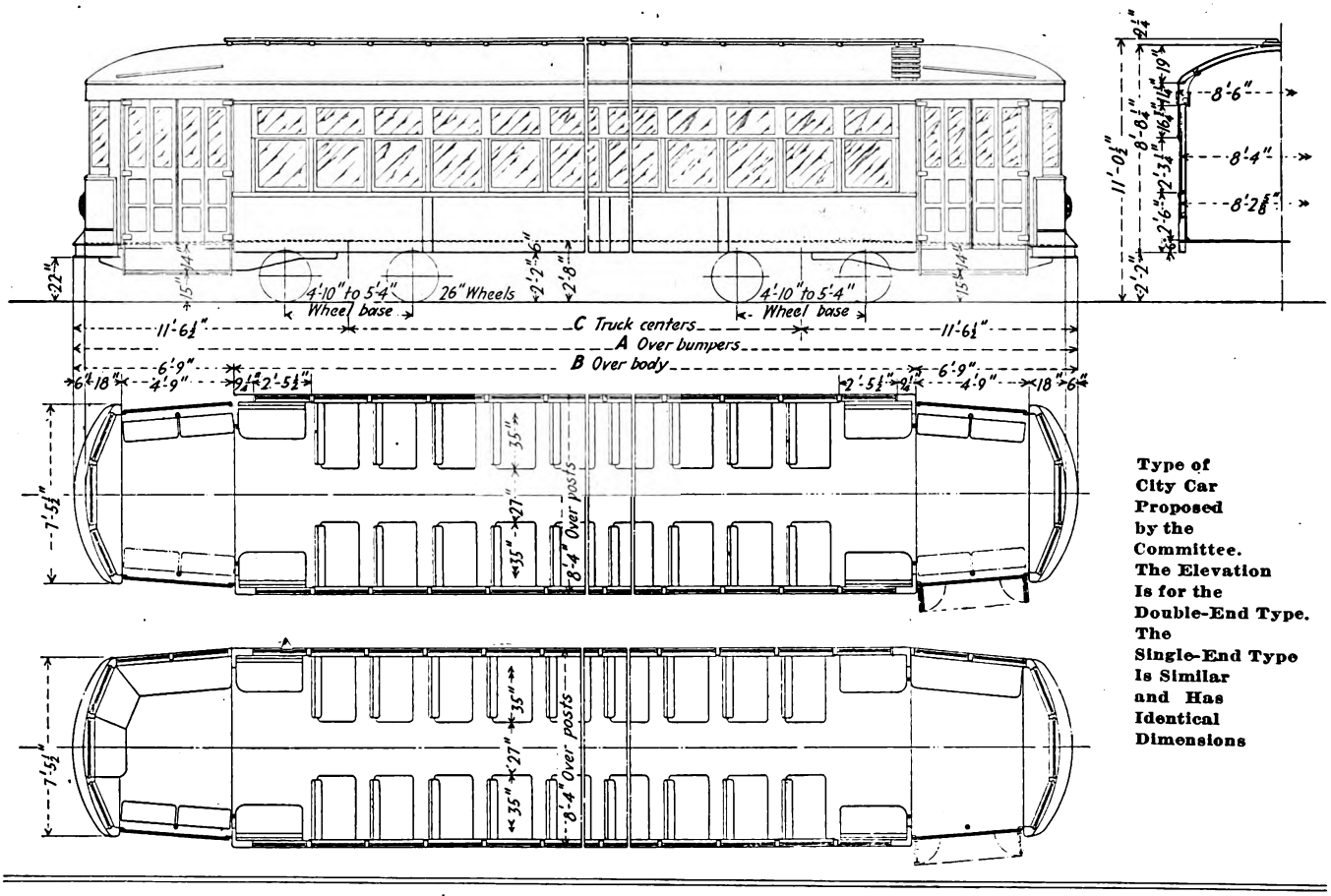

Type of City Car Proposed by the Committee. The Elevation Is for the Double-End Type. The Single-End Type Is Similar and Has Identical Dimensions

PROPOSED CITY CAR—LENGTHS, SEATING CAPACITIES AND WEIGHTS

Double-End Cars

Number of Windows in Body	Length Over Bumpers "A" Ft. In.	Length Over Body "B" Ft. In.	Truck Centers "C" Ft. In.	Seating Capacity	Maximum Weight Four 25-Hp. Motors	Maximum Weight Four 35-Hp. Motors
12	44 6½	31 0½	21 5½	48–56	32,000	37,000
11	42 1	28 7	19 0	44–52	31,200	36,200
10	39 7½	26 1½	16 6½	40–48	30,400	35,400

Single-End Cars

Number of Windows in Body	Length Over Bumpers "A" Ft. In.	Length Over Body "B" Ft. In.	Truck Centers "C" Ft. In.	Seating Capacity	Maximum Weight Four 25-Hp. Motors	Maximum Weight Four 35-Hp. Motors
12	44 6½	31 0½	21 5½	48–62	31,000	36,000
11	42 1	28 7	19 0	44–58	30,200	35,200
10	39 7½	26 1½	16 6½	40–54	29,400	34,400

It was developed that certain dimensions, weights and other features of cars built by various manufacturers were in close agreement. Comparison of such dimensions with those recommended by the committee on unification of car design in 1922 for city cars showed little variation. The data submitted by the manufacturers showed that a large majority of the cars recently built have been of the end-entrance and exit type. A few designs of end-entrance and center-exit cars submitted were individual in design and applied to special operating conditions. A few designs of single-truck cars were also submitted by the manufacturers. A study of the trend of car purchases during the past ten years indicated clearly that the trend of purchase has generally been toward the double-truck type of car. The single-truck Birney car or modifications thereof is fairly well standardized and all the manufacturers are prepared to build it should it be desired.

Principal Features Considered in Typical Cars

In the selection of the series of typical cars submitted by the committee, some of the important features kept in mind are as follows:

1. Light-weight, low-floor type.
2. Operation by either one man or two men.
3. Single or double-end operation.
4. Average city clearance conditions.
5. Quadruple equipment of motors, ranging 25 to 40 hp. for either single car or train operation.
6. End entrance and exit to permit circulating passenger movement.

With these basic ideas in mind, the three primary elements considered by the committee were size, weight and arrangement. Details of trim and specialties are left entirely to the option of the purchaser and the car builder. This permits individuality, and the designs selected allow the use of all known specialties. The committee believes that the cars selected afford a basis for general agreement except on certain interurban properties where heavy equipment with free running speeds of 60 m.p.h. or higher is considered essential. The designs selected by the committee are not applicable to rapid transit, subway and elevated service, nor has it considered articulated cars.

It is believed that the design should stimulate car manufacturers to develop cars embodying basic dimensions and other features recommended by the committee. The manufacturer, however, is not limited in developing attractive features intended to stimulate traffic.

The committee points out a number of distinct advantages to the industry from the adoption of its recommendations, which, however, cannot be realized to any great extent without the whole-hearted co-operation of

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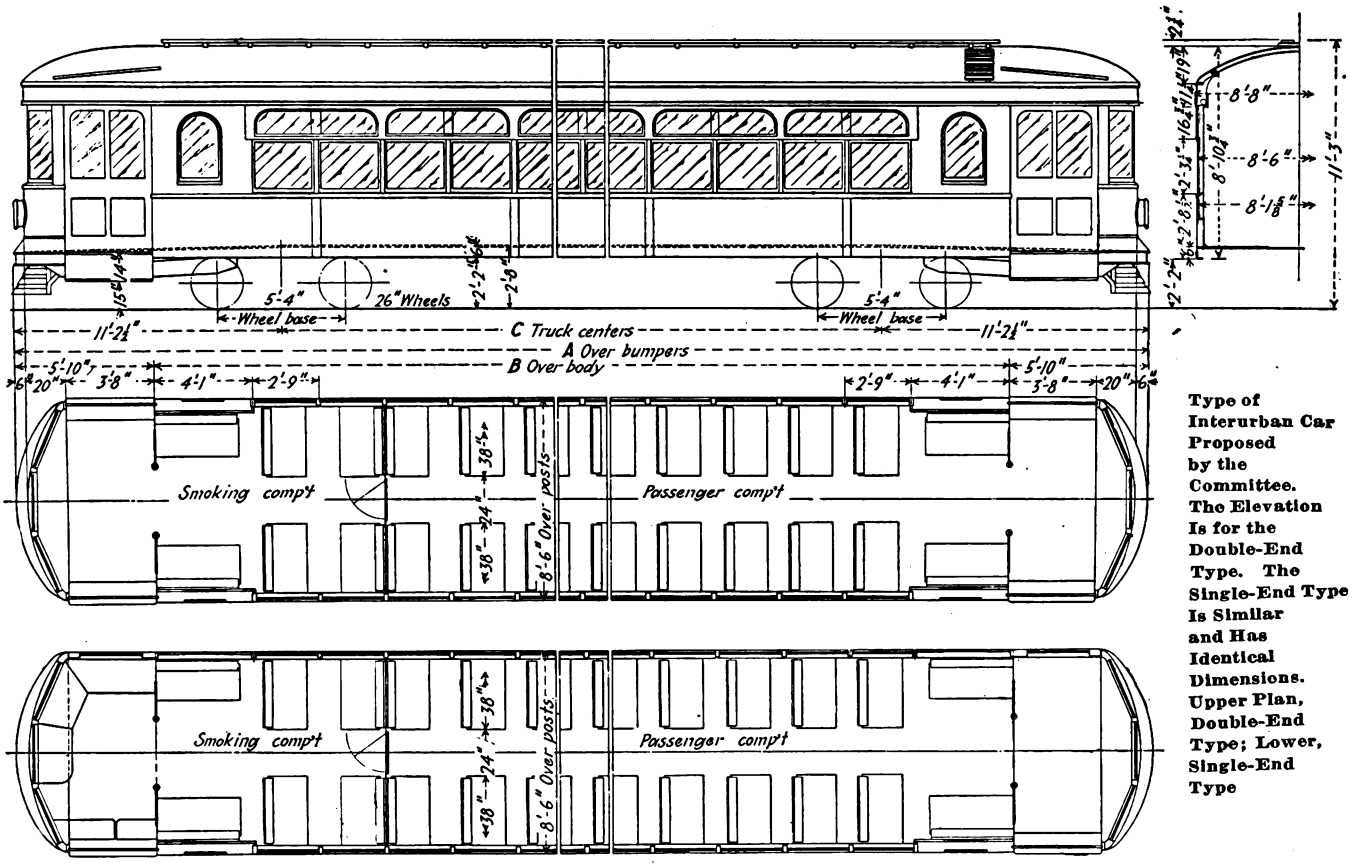

Type of Interurban Car Proposed by the Committee. The Elevation Is for the Double-End Type. The Single-End Type Is Similar and Has Identical Dimensions. Upper Plan, Double-End Type; Lower, Single-End Type

PROPOSED INTERURBAN CAR — LENGTHS, SEATING CAPACITIES AND WEIGHTS

Double-End Cars

Number of Windows in Body	Length Over Bumpers "A" Ft.	In.	Over Body "B" Ft.	In.	Truck Centers "C" Ft.	In.	Seating Capacity	Maximum Weight Four 25-Hp. Motors	Four 35-Hp. Motors	Four 40-Hp. Motors
12	47	4	35	8	24	11	48	.....	37,000	40,000
11	44	7	32	11	22	2	44	.....	36,100	39,100
10	41	10	30	2	19	5	40	28,200	35,200	38,200

Single-End Cars

Number of Windows in Body	Length Over Bumpers "A" Ft.	In.	Over Body "B" Ft.	In.	Truck Centers "C" Ft.	In.	Seating Capacity	Maximum Weight Four 25-Hp. Motors	Four 35-Hp. Motors	Four 40-Hp. Motors
12	47	4	35	8	24	11	57	.....	36,000	39,000
11	44	7	32	11	22	2	53	.....	35,100	38,100
10	41	10	30	2	19	5	49	27,200	34,200	37,200

both manufacturers and operators. Where the manufacturer adheres to the uniform designs, such as those recommended, it will result in:

1. Uniformity in dimensions which will permit the purchase of raw material in larger quantities.
2. Reduction in engineering expense.
3. Fabrication of parts on a quantity basis.
4. Simplification of the manufacturing process through the elimination of the endless variety of jigs, fixtures and dies.

The advantages to the electric railways that will result from widespread adoption of the committee's recommendations are:

1. Lower cost of cars.
2. Lower maintenance cost resulting from simplification of purchases and storing of parts.
3. Quicker deliveries of cars and renewal parts.
4. Interchangeability of cars among various properties, particularly those operated by the same management.

Basic Features of Design

If the advantages enumerated above are to be obtained, those features of design upon which general agreement is necessary are:

1. Width over posts.
2. Post spacing.
3. Height from bottom of sill to top of roof.
4. Diameter of wheels.
5. Wheelbase.
6. Step heights.
7. Type of roof.
8. Floor height.
9. Flush floor with ramped platform floor.
10. Stationary top window sash. Lower sash to raise behind top sash and letterboard so as to give a clear vision opening.
11. Standard glass sizes.

On these points, the committee states:

"With general agreement on those details, it should be possible for each car builder to proceed to design his own distinctive product and arrange to build such cars on a quantity basis. But if a sufficient part of the electric railway industry will not get behind such a unification scheme, giving up some of the ideas which have been responsible for the almost endless variety of cars, no benefit will result. For that reason, your committee earnestly recommends that the association take a poll of the industry to see how many companies will agree to purchase cars in which the fundamental features, incorporated in the cars recommended herein, are adhered to."

Drawings prepared by the committee were submitted to the committee on unification of car design, which approved the drawings of a series of typical cars and stated that there should be included a statement pointing out the practical stress limitations at certain critical

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Table I—Comparison of Old and New Equipments on Roads Considered in Report

Company	Year	Miles: Route	Miles: Track	Class of Service	No. of Passenger Cars: Total Active	No. of Passenger Cars: New	Weight Complete, Lb.	Seats	Wheel Diam., In.	One or Two-Man	Motors: No.	Motors: Hp. Each	Control	Car Speed at 600 Volts, M.p.H.	Grade
Interstate St. Ry.	1925	24	...	City	11	8	31,000[1]	44	26	1–2	4	25	K 35	..	Level
Penna.-Ohio Electric Co.	1925	19.4	...	Interurban	5	5	37,000	48	26	1	4	35	K 35	40	Level
Beaver Valley Traction Co.	1920	...	...	City and Suburban	..	..	36,000	38	33	2	4	25	K	..	Heavy
	1925	...	36			20[2]	16,500	32	26	..	2	25	..	..	
					34	6[1]	32,000	40	28	1	4	35	K	37	
Ohio Valley Electric Ry.	1923	...	...	City and Suburban	51	..	26,000 to 58,000	56[3]	33	2	..	..	K, M	..	Light
	1925	...	46		46	40	37,800	48	26	1–2	4	35	K	35	
Illinois Traction System	1925	101	...	Interurban	17	17	37,000	54	26	1	4	35	K 35	40	Rolling
United Electric Railways	1925	239	...	City	515	175	30,000	38	26	1–2	4	35	K 35	..	Rolling
Warren & Jamestown Street Ry.	1920	...	...	Interurban	5	..	60,000	46	33	2	4	60	K	..	Average
	1925	22	...	Interurban	5	3	36,000	50	26	2	4	40	K	40	
Pittsburgh Railways	1920	...	...	City	1,339	327	24,000 to 48,000	28 42	33	2	2 4	55 60	K	..	Heavy
	1925	...	599	City	1,502	795	38,000	56	26	1–2	4	40	K, Mu	35	
Lewistown & Reedsville Electric Ry.	1923	...	...	Interurban	22	..	58,000[3]	50	33	2	4	50	K	36	Moderate
	1925	9	...	Interurban	22[4]	4	36,000	48	28	1–2	4	35	Mu	40	
Milford & Uxbridge Street Ry.	1923	...	...	City and Suburban	42	..	42,800	44	34	2	4	40	K	..	Light
	1925	...	36		42	6	32,000	44	28	1	4	25	K	34	
Cumberland Traction Co.	1921	...	...	City and	..	..									None
	1925	...	15	Interurban	9	4[2]	16,500	32	26	1	2	25	K	..	
						3[1]	32,000	48	26	1	4	25	K	35	

[1] Double truck. [2] Single truck. [3] Maximum. [4] Only five regular cars required, new cars do substantial part of total mileage.

points in the car structure. The statement submitted by the committee on unification of car design follows:

1. Car body should be designed to carry under service conditions the maximum live load for which it is designed in addition to its own dead weight.

2. The direct stress in the body bolsters, platform arms, and side frame girder, due to maximum static load, must not exceed 12,000 lb. per square inch of either tension or compression.

3. The combined stress in the body bolster, due to carried load, plus the stress due to the tractive pull of the truck and application of the brakes must not exceed 16,000 lb.

4. All connections should be designed for the maximum load to which the member connected may be subject. The secondary stresses in any member caused by eccentric loads should be combined with the direct stresses in such members. The fiber stresses (except in body bolster, referred to in paragraph 3) may be taken at 20 per cent greater than those given in paragraph 2, but the direct stresses considered alone must not exceed the 12,000 lb. above stated.

5. The report of the committee on unification of car design of 1922, Fig. 2, gives the typical stress analysis of a car body. Proper provision must be made in the side girder to prevent buckling over the bolster.

6. The permissible stresses above given are predicated on steel having the characteristics called for in A.S.T.M. specification No. A-11-24. Structural steel for cars. Where other materials are used, they should bear the same proportion to ultimate strength of material used.

THE CITY CAR RECOMMENDED

The type of city car selected for city service is shown in the drawing on page 1088. Both single-end and double-end designs are shown. These may be built in three sizes, with ten, eleven, or twelve side windows, giving seating capacities of 40, 44 and 48, and a maximum available seating capacity of eight more in each case if folding seats are used. The single-end car is similar, having seating capacity of 40, 44 and 48 inside the body, the maximum available seating capacity in each case being increased by fourteen more on the platform.

The design is such that when the car is equipped with four 25-hp. motors, double-end single-car control and all safety features, the maximum weight will not exceed 32,000 lb.; when equipped with 35-hp. motors, double-end train control and safety features generally in use, the maximum weight will not exceed 37,000 lb. Weights of the single-end cars will be approximately 1,000 lb. less than those given.

The use of 40-hp. instead of 35-hp. motors will increase the weight approximately 1,000 lb. These are extreme weights. The complete weights specified are primarily limits for the car construction and not for motor selection. Service conditions may require the use of 35-hp. motors on 32,000-lb. cars and in some cases 35-hp. motors may be used on cars weighing more than 37,000 lb. In general, the 35-hp. motor is considered satisfactory for the 37,000-lb. cars.

With regard to weights, the committee states:

"It is greatly in the interest of the operating company to keep the car weights as much lower than the maximum figures given as may be consistent with good practice to suit the various operating conditions. It is

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the feeling of the committee that substantial weight reductions can be made in many instances. The way is left open for the exercise of ingenuity by car builders in the design of body structures and in the selection of materials to give minimum weight consistent with adequate strength."

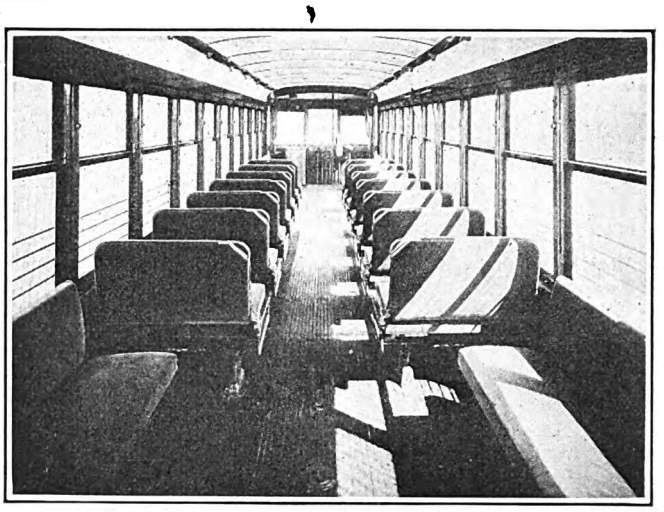
Features of Interurban Cars

Drawings of the cars selected for interurban service are shown on page 1089. The use of different numbers of windows proposed is similar to that for the city car, and the seating capacities vary accordingly. The plan submitted shows a smoking compartment, the seating of which can be varied by moving the partition. This compartment may be located at either end of the car as desired. A toilet of one or two window lengths may be installed by removal of one or two seats.

The design of the car is such that when equipped with four 35-hp. motors, double-end single-car control and safety features generally in use, the maximum weight will not exceed 37,000 lb. If 40-hp. motors are substituted, the weight should not exceed 40,000 lb. In some cases, the ten-window car may be equipped with four 25-hp. motors with double-end single-car control and safety features without exceeding 28,200 lb. In each case the single-end car will weigh about 1,000 lb. less. On level tangent track and with approximately 600 volts on the trolley, these cars are capable of free running speeds of 45 to 50 m.p.h.

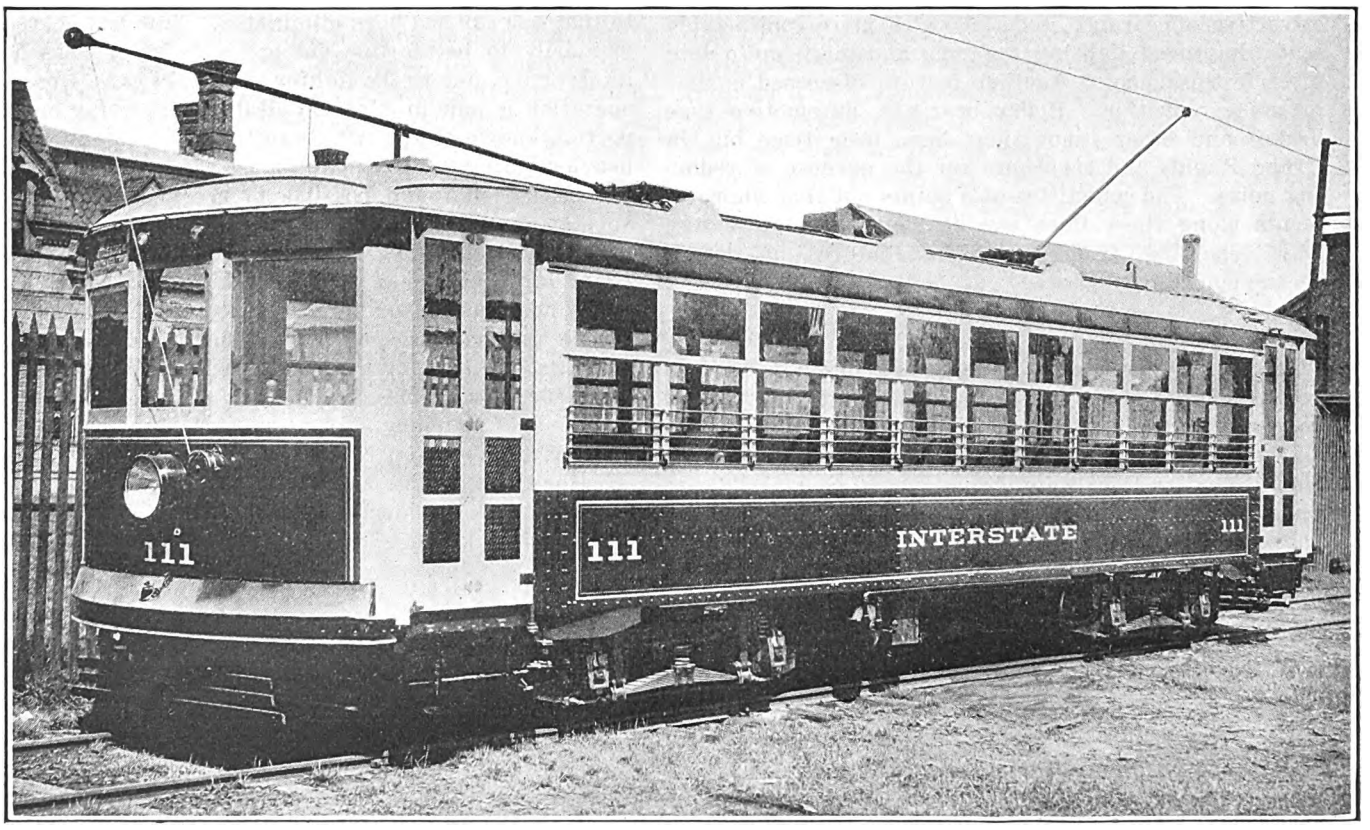
For both the city and interurban cars, the tables given under the drawings indicate the ruling dimensions and weights for the various lengths and seating capacities.

The committee was impressed by the trend during the past four or five years toward a type of car suitable for operation by either one man or two men. This has been the means of effecting substantial operating economies. All of the cars recommended by the committee may be arranged for one-man operation, one-man, two-man operation or straight two-man operation.



Seats in the New Double-Truck Cars of the Interstate Street Railway Are Upholstered in Gray Plush

Certain modifications in the designs submitted may be made without destroying the essential features of standardization. For instance, maximum traction trucks may be used on the city car with 28-in. driving wheels and two 60-hp. motors by using drop platforms. The car body from corner post to corner post may be built exactly like those shown in the drawings, thus preserving to a large extent the economies and advantages claimed by the committee for the general plan of unification. On the interurban car sliding doors have been shown because the committee believes that this type of door is best suited for the class of service. Fold-



One of Eight New Cars for the Interstate Street Railway, Attleboro, Mass. These Have Shown a Saving at the Rate of 65 per Cent on Their Cost

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Table II—Comparison of Operating Expenses Showing Reduction in Cost

	Interstate Street Railway		Pennsylvania-Ohio Electric Co.		Beaver Valley Traction Co.		Ohio Valley Elec. Railway		Illinois Traction System [4]		United Electric Railways of Providence	
	1925[2]	1925[3]	1922	1925	1920	1925	1923	1925	1923	1925	1921	1925
Way and structures	4.10	2.38	7.07	7.43	5.28	3.93	4.67	4.59	8.54	5.59	9.22	8.13
Equipment	8.11	3.14	6.19	2.66	5.62	3.77	2.88	2.55	5.24	3.11	5.99	6.94
Power	8.80	5.43	8.52	5.46	5.43	4.56	4.00	3.44	10.24	5.27	6.07	5.24
Conducting transportation	13.06	9.02	13.94	12.67	14.63	10.17	11.69	9.47	13.68	8.83	19.45	16.58
General and miscellaneous[1]	3.52	5.93	11.68	11.30	6.99	8.67	8.09	7.55	7.54	4.80	4.15	4.73
Total	37.59	25.90	47.40	39.52	37.95	31.10	31.33	27.60	45.24	27.60	44.88	41.62

[1] Includes traffic. [2] January, February, March. [3] September, October, November. [4] Illinois Valley Division

ing doors could be substituted without any serious modification in the design. In order that other details of style may be varied without affecting the essentials of design, many detailed dimensions are not given on the drawings.

The committee points out that the advantages which will result from the use of a uniform car will be increased if standard equipment parts are used throughout, such as the association's standard axles, wheels, brakeshoes, etc. As an example, the motor manufacturers carry in stock motors suitable for standard A.E.R.E.A. axles. If for a given maximum weight a larger axle is used, a special form of motor must be supplied to accommodate this increased diameter, which will mean a serious delay in shipment and a consequent increase in price.

Further Research and Experiment Urged

The tendency during the past ten years toward low-floor, light-weight cars is noted by the committee, as well as the more recent distinct trend toward a more attractive appearance, together with more comfortable seats, improved lighting systems, and more up-to-date interior equipment. Another feature discussed is that of noise reduction. Roller bearings, automotive type brakes and other innovations have been tried out in Grand Rapids and elsewhere for the purpose of reducing noise. The committee also points out that improvements along these lines can be made without in any way departing from the basic features of design recommended.

Economies Produced by Recent Cars

In order to emphasize the soundness of its position in recommending new and improved cars for electric railway service, the committee gives a series of accounts showing actual economies resulting from the substitution of modern light-weight cars for old heavy-type cars on eight properties. In addition, a table is included showing in greater detail the results of operations of the new cars on these and other properties.

On many other roads it was found that both new and old equipments are being operated, but without any segregation of operating expenses between old and new vehicles. This made it impossible for the managements to ascertain what actual savings had resulted from operation of the new cars. In consequence the committee strongly recommends that operating companies segregate these accounts so that actual economies in operation and maintenance, as well as the revenue-producing possibilities with new equipment, can be ascertained. This matter of segregation of accounts is considered important also in determining the point at which it becomes more profitable to scrap the old equipment and purchase new.

Experience of Interstate Line Impressive

On the Interstate Street Railway, Attleboro, Mass., five 31,000-lb., 44-passenger, double-truck, and three 16,000-lb., single-truck, one-man cars were purchased to replace the 45,000-lb. type then in use. The double-truck cars were equipped with four 25-hp. motors, and the single trucks with two 25-hp. motors, with type K control. The seats are covered with plush and are comfortable, while the exterior painting, in a combination of red and cream, makes the cars very attractive. These cars were put in service in July, 1925.

The road operates between Plainville, North Attleboro, Attleboro, South Attleboro, in Massachusetts, and Pawtucket, R. I., about 24 route-miles. The service calls for five ten-second stops per mile. The cars make about 11.3 m.p.h. Schedule speeds have been increased so that one car has been eliminated. This has been due primarily to better line voltage and faster passenger interchange, due to the lighter low-wheel cars. One-man operation is now in effect on all lines, excepting on that portion known as the Attleboro Branch Railroad, where heavier riding requires two men.

It has been found possible to use a semi-automatic substation, which is adjacent to the carhouse, so that a shop man looks after it, releasing three men. On account of the lessened repair work with the new cars, there has been a further reduction in the shop force.

The cars have been in use for such a short time that operating figures for a full twelvemonth period are not available. In Tables II and III are, therefore, comparisons of January, February and March with September, October and November, both in the year 1925. Weather and traffic conditions were quite similar for these periods. Reductions in operating costs per car-mile in the account affected by the new cars are: Equipment, 61 per cent; power, 38 per cent; conducting transportation, 31 per cent, or a total of 33 per cent. The management has been able to reduce other costs also, so that the total expense per car-mile has gone down from 37.59 cents to 25.9 cents. If the savings attributable to the new cars continue, they will be at an annual rate equivalent to 65 per cent on the $84,000 investment in the new cars.

One of the outstanding results which have been obtained is the co-operation of the public. During the receivership the situation was so bad that the Attleboro

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with Modern Cars

Warren & Jamestown Street Railway		Pittsburgh Railways		Lewistown & Reedsville Elec. Ry.		Milford & Uxbridge Street Ry.		Cumberland Traction Co.	
1920	1925	1920	1925	1923	1925	1923	1925	1921	1925
11.87	2.85	9.81	6.28	4.71	3.27	5.07	3.61	4.84	2.70
4.35	1.55	6.91	5.63	1.86	1.72	3.09	3.25[5]	6.52	3.20
10.25	7.75	6.30	5.05	12.63	7.11	8.15	6.72	6.36	4.60
11.18	9.18	19.22	18.31	16.00	13.83	14.92	10.40	8.75	7.00
6.54	4.67	4.96	7.18	2.70	2.67	2.97	2.57	3.40	3.51
44.19	26.00	47.20	42.45	37.90	23.60	34.20	26.55	29.82	21.01

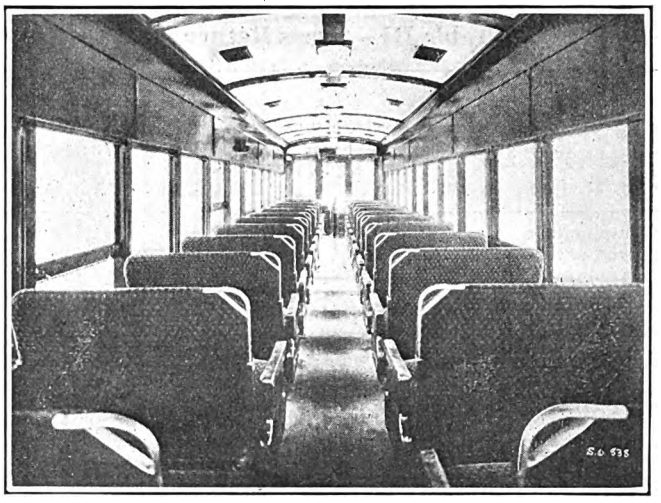
[5] Overhauling old cars included.

residents had to decide whether they wanted car service continued or replaced with buses. Nearly every one wanted the railway to continue. As a result, the municipal authorities have tried hard to assist its management in every way. School children's fares have been increased, the company has been relieved of the necessity of furnishing liability bonds for its buses and permits have been refused to independent operators who wished to compete with the railway's local buses.

During the latter part of 1925 there was a business recession in the districts served, so that no increase in passenger revenue resulted at that time from the use of the new cars. However, it is significant that in March, 1926, there was an increase in passenger revenue of 17 per cent over the preceding year.

Pennsylvania-Ohio Electric Company Finds New Cars Advantageous

On the 20-mile line of the Pennsylvania-Ohio Electric Company, between Youngstown, Ohio, and New Castle, Pa., half-hour service was formerly operated with four regular cars. In 1922 conditions became so bad that it was deemed impracticable to continue the schedule. The logical thing seemed to be to give half-hour service from Youngstown to Lowellville and one-hour service from Lowellville to New Castle. The change was made when the new one-man cars were put in operation in 1923. The revised schedule reduced the car mileage, but not



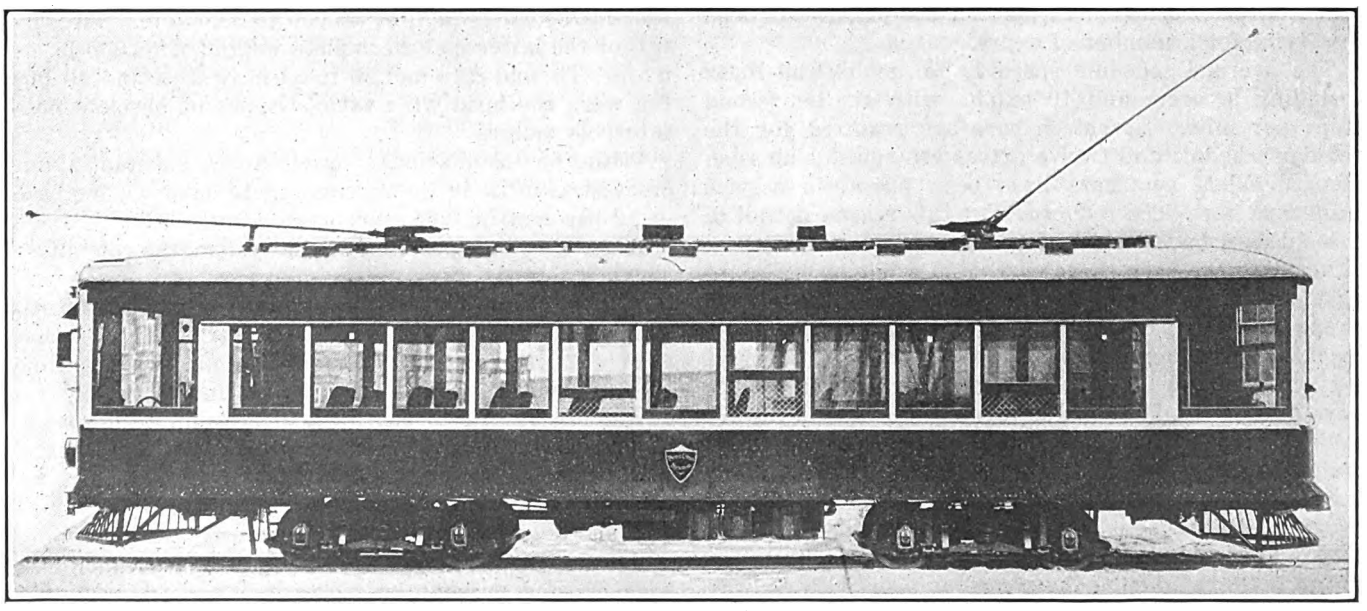
The Interior of the P-O Car Is Attractive and Pleasing to the Passengers

the number of regular cars. It must be remembered that the railway would in any case be operating the present schedule regardless of whether or not new cars were installed.

The new cars weigh 37,000 lb., compared with 54,000 lb. for the old cars. They have four 35-hp. motors as compared with four 90-hp. motors on the old cars. The new cars are attractive and comfortable. There are no hanging straps to obstruct the passengers' view and no advertising signs. Amply spaced plush seats are used. The new cars are geared for about 40 m.p.h., and make the trip from Youngstown to New Castle in 60 minutes. This schedule is made with about 1.4 stops per mile, of eight seconds each.

One-man operation was a success from the start. There has been a considerable reduction in equipment maintenance, power costs and platform expense. The new cars take about 2.76 kw.-hr. per car-mile, as compared with 3.83 for the old cars, a saving of 28 per cent. Equipment maintenance has been reduced 51 per cent and platform expense 15 per cent, the total being 30 per cent less than the former cost.

In Tables II and III the comparison of operating costs is given, with the 1922 mileage adjusted to com-



One of the Four Pennsylvania-Ohio Cars That Have Been Earning 41 per Cent a Year on the Investment

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Table III—Gross Return on Investment in Modern Cars Is from 15 to 65 per Cent

Savings in	Interstate Street Railway	Pennsylvania-Ohio Electric Co.	Beaver Valley Traction Co.	Ohio Valley Elec. Railway	Illinois Traction System[3]	Warren & Jamestown St. Ry.	Pittsburgh Railways	Lewistown & Reedsville Elec. Ry.	Milford & Uxbridge Street Ry.
Equipment	$4,868[1]	$12,270	$32,450	$12,900	$29,592	$4,230	$818,000	.....	.....
Power	4,320[1]	10,720	7,150	12,240	15,477	750	.....	.....	.....
Conducting transportation	4,515[1]	7,075[2]	63,350[2]	51,000[2]	292[2]	.....	206,000	.....	.....
Total	$13,703[1]	$30,065	$102,950	$76,140	$45,361[4]	$4,980	$1,024,000	$8,850	$31,245
Approximate investment in new cars	$84,000	$72,500	$196,000	$500,000	$186,000	$39,000	$7,000,000	$42,000	$77,650
Gross return on investment, per cent	65	41	52 5	15.2	41	12.8	14.6	19.7	.....

[1] Three months; total prorated to twelve months, $54,812. [2] Platform only. [3] Illinois Valley Division
[4] Increased revenue $33,000; total savings and increased revenue, $78,361.

pare with that run in 1925. On this basis there was a saving of $30,000 in the items of equipment, power and platform labor. On an investment for five new cars which approximates $72,500 the gross return figures out 41 per cent.

Beaver Valley Traction Company Modernizes Its Rolling Stock

In the retirement of old cars and making replacements with modern types the Beaver Valley Traction Company has been very active. This company, with a total of 36 track-miles, serves a number of communities in the Beaver Valley having a population in excess of 70,000. The grades and curves are relatively severe, with the result that the demand on equipment is more or less difficult.

The modernization program began in September, 1920. At this time, and in August, 1921, twenty standard safety cars were purchased. In November, 1923, six modern light-weight double-truck cars were added. These latter cars are of the one-man, two-man type, with four 35-hp. motors. They weigh 32,000 lb. and seat 40 passengers. These cars replaced 36,000 lb. double-truck semi-convertible cars equipped with four 25-hp. or four 40-hp. non-interpole motors. It is interesting to note that no extremely heavy cars have been operated and that a large proportion of modern equipment has been in service for a number of years.

The average schedule speed is for all of the lines, including layovers and 10 m.p.h., with six ten-second stops per mile. Seventeen cars are required for the regular schedule and twelve extras are run during rush hours. When new cars have been placed in service headways have been reduced. For this reason not all of the old cars have been retired.

Results have been so good that it is felt by the management that without the use of modern cars and a change to one-man operation it would not have been practicable financially to continue operating the property. As shown in Tables II and III, operating costs have declined and further improvements in this respect are anticipated. The principal savings have been in car maintenance, power and platform labor. The total saving in 1925 as compared with 1920 is $102,950. The approximate investment is $196,000, so that the return on this is approximately 52.5 per cent. It is also interesting to note that during the past four years this railway has financed improvements to the extent of more than $400,000 out of net revenue. The six modern double-truck cars purchased in 1923 were paid for on the basis of 25 per cent cash and the balance in one year, all out of earnings. These cars cost about $11,000 each.

Ohio Valley Electric Railway Has 100 per Cent Modern Equipment

During the latter part of 1923 the Ohio Valley Electric Railway made a complete replacement of all its rolling stock on the lines operated in Huntington, W. Va.; Ashland, Ky., and the suburban route between the two cities. There are four city lines in Huntington and one in Ashland, while the 16-mile connecting line serves a number of intermediate communities. The city lines in Ironton, Ohio, are not included in the equipment replacement. The property comprises 46 track-miles, serving a population in excess of 150,000. As the territory is adjacent to the Ohio River, the grades are comparatively light.

The forty modern light-weight cars which give the entire service weigh 37,700 lb. complete and seat 48 passengers each. They are equipped with four 35-hp. motors. The old rolling stock which they replaced consisted of four single-truck, two-motor cars weighing 26,000 lb. complete, fourteen double-truck, two-motor cars weighing 39,000 to 47,000 lb. and 33 double-truck, four-motor cars weighing 46,000 to 58,000 lb. Twenty-two of the latter had a complete weight of 54,000 lb. or more. The old cars had 33 to 34-in. wheels and all but ten were equipped with various types of obsolete non-interpole motors.

With the installation of new cars a substantial increase was made in the mileage, there being an increase of 12 per cent in 1925 as compared with 1923.

Regarding the operation of the system, the committee says:

"A very interesting fact in connection with the operation of the Huntington-Ashland suburban line is that with modern cars it is possible to maintain the same headway with two less cars. The line originally required twelve cars to provide a fifteen-minute headway, and the same service is now performed with ten cars. The round-trip time, including layover, has been reduced from 180 minutes to 150 minutes, a saving of 16⅔ per cent, and no difficulty is experienced in keeping the modern cars on time. Also, this improvement has been effected without an increase in the free running speed of equipments (except for voltage improvement,

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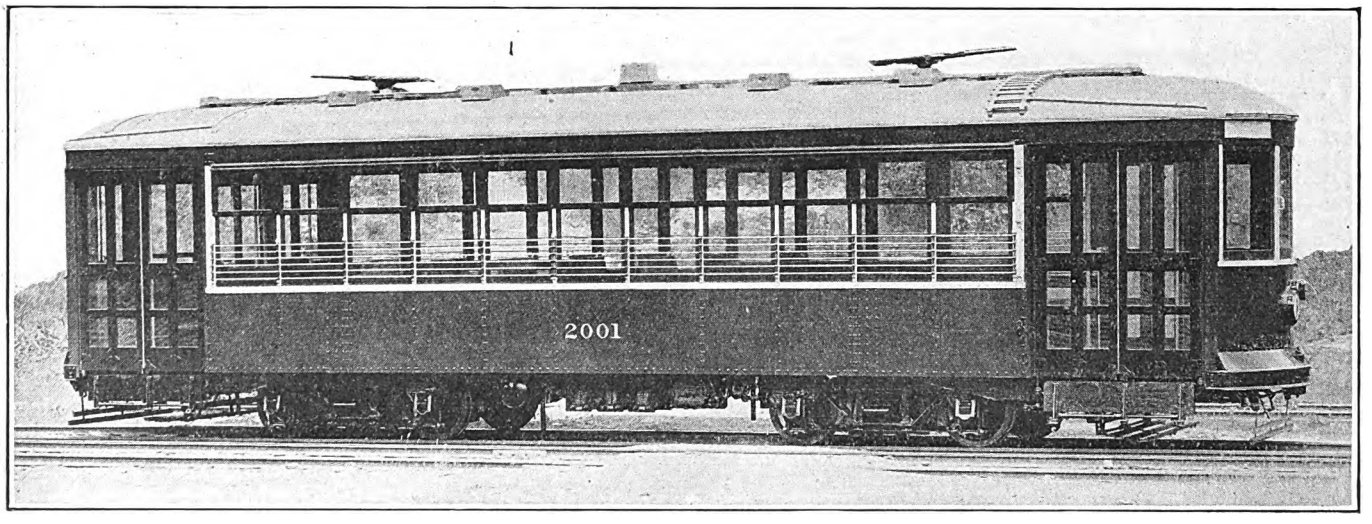
due to the use of lighter cars) as the modern cars are geared for the same car speed as those replaced. High-speed operation is restricted, due to frequent stops, therefore the rapid accelerating and braking rates of the modern cars account, to a considerable extent, for the schedule improvement."

Since some of the modern cars were in service during the last two months of 1923, that year is not entirely representative of old car operation. The reduction in operating costs is, however, quite striking. Actual car maintenance is interesting, as shown by the following costs:

	Cents per Car-Mile		
	1923	1924	1925
Account 30, Passenger and combination cars..	1.00	0.71	0.73
Account 31, Electrical equipment of cars.....	0.51	0.25	0.20

In 1925 there was a reduction of 27 per cent for account 30 and 61 per cent for account 33 from the figures of 1923. It is also interesting to note that the expenditures for maintaining the old cars was reduced to a minimum during their last year of operation.



One of the New Providence Cars. These Have Reduced Expenses and Have Cut Pull-Ins to Less Than Half What They Were Before

The modern cars cost approximately $12,500 each, representing a total investment of $500,000. They were purchased on the car trust plan. The total saving of $76,140 in operating expenses shows a return on this investment of 15.2 per cent. While operating revenues have decreased, the management feels that the decline would have been much more drastic if modern cars had not been put in service. The economy of the new equipment enabled the company to continue operation at a profit.

Illinois Traction Adopts Light-Weight Cars

In 1923 the interurban passenger cars of the Illinois Valley Division of the Illinois Traction System weighed 94,000 lb. Each was equipped with four 100-hp. motors and service was given on a two-hour headway. This line consists of 101 miles of road, extending from Joliet 85 miles westerly to Princeton, with a 16-mile branch from Ottawa to Streator. City cars are also operated in the adjoining cities of La Salle and Peru. A freight and express service is conducted over the interurban route.

During 1924 the heavy cars were replaced by seventeen new single-end light-weight one-man interurban cars seating 54 and weighing only 37,000 lb. These cars are equipped with four 35-hp. motors. With the new equipment the headways were decreased to one hour, doubling the service. Passenger comfort was featured in these new cars. They are geared for about 40 m.p.h. and make an average schedule speed of 21.4 m.p.h., with one 35-second stop per mile. Ordinarily passengers enter and leave by the front door. At heavy loading points the rear door may be operated by a valve and fares collected by a street collector.

The interurban operating costs for these accounts were reduced by the use of these cars as follows: Equipment, 73 per cent; power purchased, 42 per cent; platform service, 27 per cent. There has been a reduction of 33 per cent in the shop force, although there are now two more city cars in La Salle and Peru. In 1923, 92 per cent of the 22,239 trains operated were on time. In 1925 this was increased to 97.2 per cent of the 32,858 trains on time. With an increase of 70 per cent in interurban passenger car mileage, operating expenses in 1925 were about $39,000 less than in 1923. Meanwhile, the passenger revenue increased $33,000. The total gain of $72,000 represents a gross return on the investment of about 39 per cent. Detail figures are given in Tables I, II and III.

Providence Makes Large Saving

Prior to the modernization program of the United Electric Railways of Providence, R. I., 41,000-lb. two-man cars were being operated. Early in 1922, 25 Birney cars were placed in service. About the middle of the next year 150 one-man, two-man cars were added. At present 222 cars are required in base service and a total of 1,242 in rush hours. With the advent of the new cars 222 closed and 269 summer cars were taken from service. At the present time 79 per cent of the cars in base service are of the modern, low-wheel type. In addition, 35 double-truck cars were received in June, making the equipment for base service 85 per cent modern and 100 per cent one-man operated.

About the time of the advent of the new cars a number of changes were made in routing, service and fare collection methods. These have been detailed in ELECTRIC RAILWAY JOURNAL. They have resulted in considerable improvement to service.

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Average schedule speed is 8.8 m.p.h., with about 8.5 stops per mile. Schedules were slowed down somewhat when the one-man cars were introduced. It is now felt that it may be possible to increase schedule speed, and a study is being made for that purpose.

It is somewhat difficult to give definite figures of savings in equipment, power and platform expense which may be credited to the new cars. There is no question but what these accounts have been materially reduced and better service provided. Expenditures in account 30, passenger and combination cars, and account 33, electrical equipment of cars, have been reduced 10 per cent and 20 per cent respectively for 1925 as compared with 1921, even though a complete overhaul of cars has been under way for the last year and a half. Pull-ins were 0.67 per thousand miles in 1921 as compared with 0.292 for the first eight months of 1925, a reduction of more than 50 per cent.

Showing the trend, energy consumption may be compared in the city of Pawtucket. In that city 25 new floor cars weighing 36,000 lb. complete were purchased to improve service and reduce operating cost. They seat 50 passengers and have long comfortable cross seats. The electrical equipment consists of four 40-hp. motors. When the new equipment was put in service a reduction in running time of five to ten minutes was made. Otherwise, the schedules remained the same. It is considered possible to reduce the running time sufficiently to take one of the three cars out of service and maintain the schedule with two cars. Originally it was planned to run the new cars with one man, but this has not been done. Such operation offers an excellent possibility of further economy.

As shown in Tables II and III, there has been a reduction in operating expense of 41 per cent. The most striking saving is in maintenance of equipment. Account 30, passenger and combination cars, went down from 1.35 cents per car-mile in 1920 to 0.79 cent in 1925, or 31 per cent; while account 33, electrical equipment of cars, dropped down from 1.05 cent per car-mile

Table IV—Age of Passenger Cars Representing 66 per Cent of the Industry

Based on ELECTRIC RAILWAY JOURNAL Questionnaire (March, 1926)

Geographic Division / Date Built	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total Cars
	Number of City Cars									
1921—1925	436	2,012	2,182	560	426	171	359	56	616	6,818
1916—1920	1,592	2,947	1,849	581	490	108	284	22	366	8,239
1911—1915	1,323	1,490	2,572	954	524	244	250	210	865	8,432
1906—1010	343	2,665	3,332	569	567	282	267	233	659	8,917
1901—1905	709	2,995	2,338	1,062	509	358	316	112	378	8,777
Prior to 1900	448	3,639	1,172	404	155	136	134	164	198	6,350
Total	4,851	15,648	13,445	4,130	2,671	1,299	1,610	797	3,082	47,533
	Number of Interurban Cars									
1921—1925	45	61	274	15	11	14	11	18	36	485
1916—1920	92	83	186	20	41	15	28	34	16	515
1911—1915	38	152	160	66	28	5	88	46	28	611
1906—1910	91	257	238	43	30	5	45	8	92	809
1901—1905	276	161	340	50	30	32	26	.....	84	999
Prior to 1900	61	71	96	21	19	.....	.....	6	69	343
Total	603	785	1,294	215	159	71	198	112	325	3,762
Total, city and interurban	5,454	16,433	14,739	4,345	2,830	1,370	1,808	909	3,407	51,295
Cars more than twenty years old	1,494	6,766	3,946	1,557	713	526	476	282	729	16,489
Per cent of total cars over twenty years old	27.4	41.1	26.7	36.1	25.2	38.4	26.3	30.9	21.4	32.1

double-truck cars weighing 30,000 lb. recently replaced 25 older cars weighing about 39,000 lb. This change resulted in a reduction of 54,120 kw.-hr. for April, 1926, as compared with last year, representing an annual saving of about 650,000 kw.-hr. Platform expense has been reduced nearly 20 per cent as compared with 1921, even though operators got nearly 20 per cent higher wages than they did in that year. Tables II and III give details of the savings.

EXPENSES REDUCED ON WARREN & JAMESTOWN

Results with modern cars have been very satisfactory on the Warren & Jamestown Street Railway, both from a financial and an operating standpoint. The property consists of a 22-mile interurban line between the two cities. Grades are heavy, in a number of cases being 8 to 10 per cent.

The former rolling stock on the interurban lines consisted of five double-truck cars weighing 50,000 to 60,000 lb. complete. These cars were eighteen to twenty years old, although the motors had been replaced by those of interpole type. In 1923, three modern light-weight, low-

in 1920 to 0.28 in 1925, or 73 per cent. The total represents a reduction from 2.4 to 1.07 cents per car-mile. It will be noted that the cost of maintaining the old cars was unusually low.

A new concrete highway has been built paralleling the road the entire distance. This adversely affected earnings so that gross revenue went down from 56.25 cents per car-mile in 1920 to 37 cents per car-mile in 1925. Despite this, the total operating expense was reduced 34.19 cents in 1920 to 26 cents in 1925, so that the net revenue went down only from 12.06 cents to 11 cents per car-mile, which is not materially lower.

With the new cars and operating economies, it has been possible to reduce expenses sufficient to keep the property on a paying basis. Future improvements in service will no doubt result in increased traffic and further reduction in operating expenses. Patrons are well pleased with the improvements that have been made.

PITTSBURGH RAILWAYS A PIONEER

Early in 1914, the Pittsburgh Railways began the operation of modern light-weight, low-floor cars. Addi-

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tional cars have been purchased practically every year subsequent to that date. The present replacement program contemplates the retirement of all old and heavy equipment.

Conditions in Pittsburgh are familiar to readers of this paper. The business district of the city is located adjacent to the Allegheny and Monongahela Rivers and the hills are steep, with maximum grades of 8 to 10 per cent. Narrow streets and sharp curves limit the width of cars that can be used.

At present there are 795 low-floor cars in service, and 50 more on order. The city cars weigh complete from 33,200 lb. to 38,000 lb. There are 35 interurban cars included among the modern type, of which fifteen weigh 47,000 lb. complete, while the remaining twenty are similar to the city cars. All the cars have both end and center doors, and seat from 54 to 56 passengers. The standard equipment is four 40-hp. motors mounted on 26-in. wheels, although some of the earlier cars have 24-in. wheels.

Most of the old cars replaced were double-truck type with 33-in. wheels and weighed 48,000 lb. complete. The motors were obsolete types. A large number of old single-truck cars have also been superseded.

To fill the schedules on the 100 lines operated, 494 cars are required in the base schedule, 1,065 in the morning rush hour and 1,126 in the afternoon rush hour. With the modern cars, service improvements have been introduced. Headways have been cut on many lines, or else two-car train operation has been substituted for single units. Schedule speeds have not changed materially, though traffic congestion has increased to the extent that it is doubtful that they could have been maintained with the old equipment.

The new equipment and improved operating methods have naturally reduced operating costs. The comparison given in the tables between 1920 and 1925 indicates what can be accomplished by retiring old equipment.

Table V—Results with New Cars on Six Routes in Pittsburgh

Route No.	Cars	Daily Averages — Earnings	Daily Averages — Mileage	Increase, per Cent — Earnings	Increase, per Cent — Mileage
1	Old	$200	435	.....	.....
	New	245	434	22.5	0.0
4	Old	532	695	.....	.....
	New	570	895	7.14	28.78
26	Old	433	781	.....	.....
	New	523	912	20.78	16.78
34	Old	303	669	.....	.....
	New	355	832	17.16	24.37
87	Old	917	1,716	.....	.....
	New	1,004	2,047	9.49	19.45
96	Old	372	1,102	.....	.....
	New	451	1,408	21.23	27.76

They show a reduction of 10 per cent in operating costs per car-mile during the past six years.

The reduction in car maintenance expense is even more striking. Account 30, passenger and combination cars, has gone down from 3.06 cents per car-mile in 1920 to 2.20 cents in 1925, and account 33, electrical equipment of cars, from 2.26 cents in 1920 to 1.06 cents in 1925. The total expenditures have been reduced 39 per cent during the six-year period.

The new cars, which cost $15,000 each, have been acquired under the car trust plan, with payments in fifteen equal annual installments. The saving shown in Table III, totaling $1,024,000 on $7,000,000, amounts to 14.6 per cent on the investment.

As an indication of the results, the committee makes the following statement:

"Prior to the time when a general program for the retirement of obsolete equipment was inaugurated (1922), no return was being earned on the investment and it was not possible to pay old debts, paving charges and license fees. At present, the company is paying all

Tale V—Results with New Cars on Six Routes in Pittsburgh

Company Class	Annual Gross Revenue	Number of Passenger Cars — 1907	1912	1917	1922
A	Over $1,000,000	49,004	56,704	62,186	62,484
B	$250,000–$1,000,000	10,675	10,497	10,163	9,051
C	Under $250,000	10,337	8,961	7,565	5,766
Total		70,016	76,162	79,914	77,301

Figures from U. S. Census Bureau reports.

operating expenses, taxes, old debts incurred prior to reorganization in February, 1924, paving and license charges, as well as earning a 6 per cent return on a valuation of $62,500,000. The interest and carrying charges on the investment in new equipment and 6 per cent of $5,000,000 borrowed in 1924 is also being earned. Undoubtedly, the operation of modern cars, with the resulting betterment in the character of the service provided, has contributed largely to the improved financial condition of the property. . . .

"Revenues were well maintained during the past few years, a period which has been very unfavorable for many railway properties.

"Although gross revenues per car-mile for 1925 are slightly lower than for the preceding years, the annual car mileage has been increased, and not only have gross revenues increased but the net income for 1925 was greater than for 1924."

These data on revenue apply to the entire system and do not indicate to what extent modern cars have caused improvement in this respect. Comparative data have been kept on certain lines when new equipment was installed, and the results on six routes are shown in Table IV.

Statistics Show Need for New Cars

Some interesting data were brought out by the committee concerning the present passenger car situation. A study of the United States Census figures shows that the number of passenger cars owned by electric railways with gross revenues of more than $1,000,000 a year increased rapidly from 1907 to 1917, while those of smaller systems have decreased, slowly for the companies between $250,000 gross revenue and $1,000,000 gross revenue, and rapidly for the companies of less than $250,000 a year. The figures are given in Table VI.

Approximately 81 per cent of all passenger cars in 1922 were owned by class "A," the group of large companies. Of the remaining 19 per cent, the middle-sized or class "B" companies owned 12 per cent, and class "C" companies, 7 per cent. It is important to note that despite the enormous increase in motor vehicle registration, which went up from 140,300 in 1907 to 10,864,128 in 1922, the cars owned by the large class "A" companies were still increasing in number.

As to the number of cars the electric railways may be expected to purchase annually in the future, the com-

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mittee states: "That is a difficult question to answer, and it has been complicated by the advent of the motor bus. No one can predict the extent to which the motor bus will be utilized by electric railways in giving public transportation."

From 1907 to 1916, the electric railways purchased an average of 3,764 passenger cars per year. From 1917 to 1925, the average annual purchases went down to 2,353, or 62.4 per cent of the volume prior to the war. Assuming that the purchases before the war represented a fair average under normal conditions, there has been a deficit of 1,411 cars purchased per year, or a total of 12,699 cars. The motor buses purchased during the later period offset to some extent the deficiency in cars, although many of them have been placed in service as feeders to rail lines, and represent extensions to service.

Replacing of older cars with new and attractive equipment is an economic problem to be determined on each property. The data included in the report make it obvious that on certain properties modernization of equipment has been an essential in stimulating traffic and in reducing operating and maintenance costs. The committee believes that every railway should properly analyze its own situation to see what can be accomplished along similar lines.

The committee gives several tables showing by states and by geographical division the age of passenger equipment now in service. The figures are based on replies to a questionnaire by this paper, covering 51,295 cars or approximately 66 per cent of the total passenger cars in the industry. Table V gives a summary by geographical divisions of the information. It will be observed that 32.1 of all passenger cars reported were built more than twenty years ago. If that proportion is applied to the total passenger cars in the industry as given by the 1922 census report, there are in round figures 25,000 passenger cars in service today that were built prior to 1905. Commenting on this, the committee states:

"Since those cars were built there have been so many improvements in car design tending toward higher efficiency in operation, lower maintenance costs and greater safety and comfort for passengers that their replacement is a matter of vital importance. Car rides can be sold, but not on cars of the vintage of 1905."

Public Safety Demonstrated in El Paso

UNDER the guidance of Tom Walker, manager El Paso Electric Railway, El Paso, Tex., a program of safety stunts and playlets was staged last month. Besides running the railway and other utilities in El Paso Mr. Walker is chairman of the Forum Public Safety Committee, and it was under the auspices of this committee that the stunts were conducted. Amusement as well as instruction was afforded the audience who attended the two performances, one in the afternoon and the other in the evening.

Captain Stanley Good and his traffic force co-operated in several of the acts. The various features presented were "Tribulations of Traffic Police." "Vacation Hazards" was arranged by the Woman's Club and was directed to the school children of the city. "Automobile Hazards" and "Pedestrian Hazards" were arranged by auto dealers and the superintendent of play-ground teachers respectively.

Superintendent of Distribution J. E. Jordan of the El Paso Electric Company arranged the skit on "Street Car Hazards," and the superintendents of two steam railroads conducted a similar affair entitled "Steam Railroad Hazards."

Houston's Talking Cars from Old Equipment

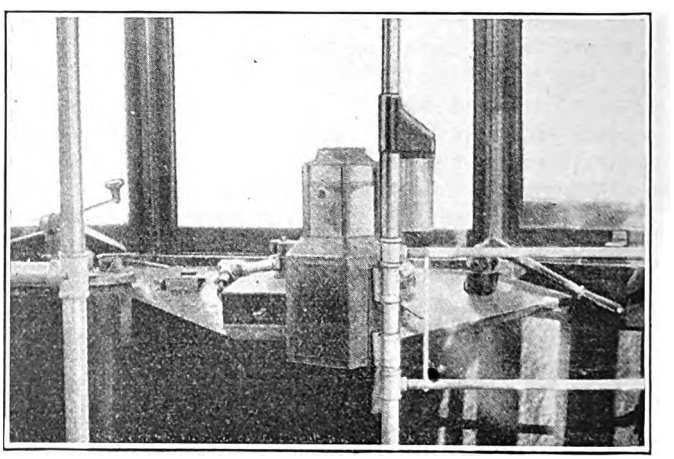
Many Innovations Introduced to Attract the Attention of the Car Rider—Air-Operated Electric Signs Used Effectively

BY F. J. BENNETT

Master Mechanic Houston Electric Company, Houston, Tex.

PRONOUNCED popularity has resulted from the remodeling of certain old cars of the Houston Electric Company. Many of these cars were due for overhauling, and while accomplishing this maintenance work important changes were affected.

The heavy couplings were removed, effecting some economy of weight. The seats were covered with gray



All Piping Is Inclosed on the Remodeled Cars in Houston, Leaving No Pockets for Dust and Dirt to Collect. Note the Pockets Provided for the Operator's Punch and Transfers at the Left of the Casing

Kemi-suede, and floors were covered with ¼-in. rubber tile. On some cars we used a plain color of material and on others a tiled effect. Either style gives a clean floor and deadens much of the noise arising from the trucks and tracks.

All piping at the front of the car has been neatly incased in a wood compartment, which serves not only to conceal the unsightly pipes and fixtures so common to street cars but makes it possible to sweep and clean the platforms thoroughly.

The urge today is to get something different in designs and finish—something better, but, still, little things that change the appearance and attract attention we believe essential. For this reason we have not standardized on any particular color or finish. Some of the cars are refinished in the interior, using the natural wood colors, and on others we plan to enamel the wood trim, using agreeable colors similar to the newer type Pullman cars today.

The first few cars have been painted a white and cream on the exterior. This combination has been varied on others. The effect is startling and has attracted much favorable comment.

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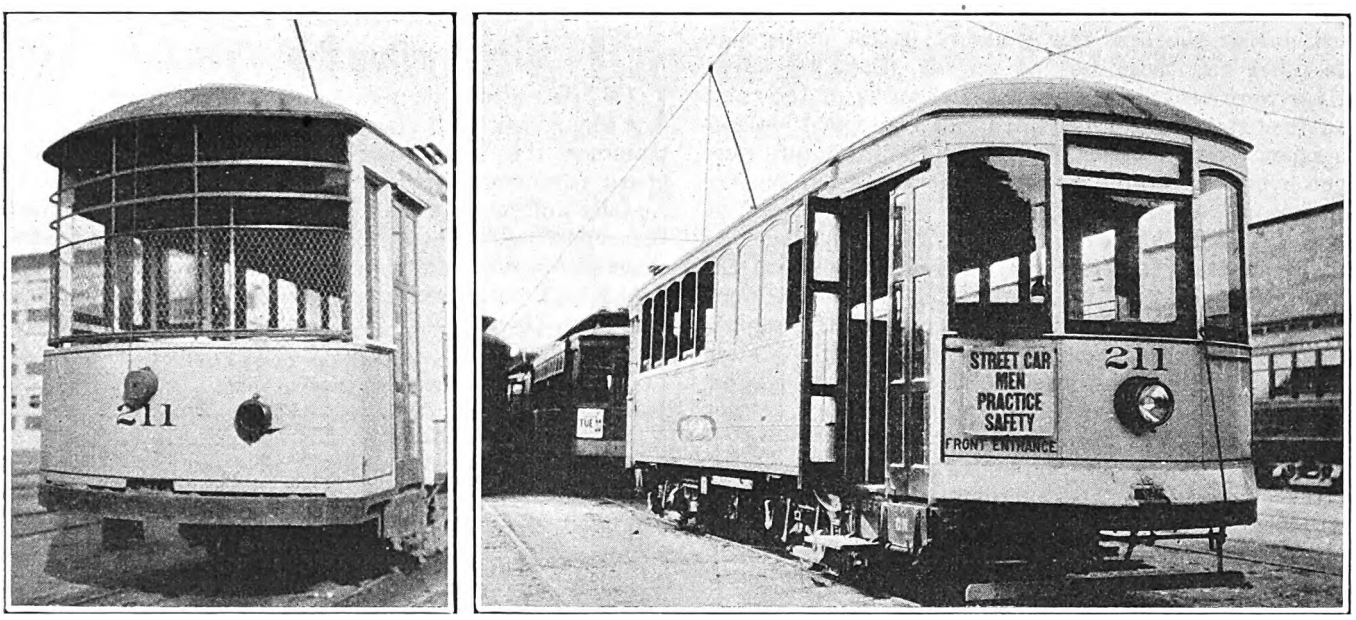

Houston's "Talking Cars"

Bodies are painted a white and cream combination and give the impression of new cars. The sign at the bottom of the right-hand vestibule window reads "Enter at Front." The green illumination of the sign does not photograph clearly. The illustration at the left shows a rear view of Houston's remodeled cars with the open screened-in vestibule. The treadle device has been installed for rear exit use. The red light observed flashes "Stop" when brakes are applied.

Another innovation that has created comment concerning "Houston's talking cars" is the use of illuminated signs. The passenger ready to board the car observes an illuminated sign that flashes on when the car approaches, reading "Enter at the Front." When about to stop, another illuminated sign in the interior lights up over the front vestibule, reading "Leave by the Rear."

Since each of the cars in the city service is operated by one man, these remodeled cars have been equipped with the treadle device that allows the passenger to open the rear door by stepping on the treadle when the car is stopped. The air valve operating this door engine is inoperative except when brakes are fully applied.

Upon leaving, a small sign flashes "We Thank You." This is mounted just above the exit opening. For the approaching motorist, a red light shines to the rear when brakes are applied, illuminating the word "Stop" in red. The switches operating these lights are operated by air pressure, when air is applied to the brake cylinder line.

All of these cars are single-enders, since it is unnecessary to reverse at the line termini. On account of our favorable weather conditions, the rear platform is open except for a screen protection around the outer edge.

Innovations and novelties are considered important elements in arousing interest in our service and creating a realization that the company is attempting to serve the public of this fast-growing city.

Close-Up of Front Sign Reading "Enter at Front." This, as Well as Interior Signs, Is Turned on by an Air-Operated Switch Attached to the Brake Line, so It Is Illuminated Only When Brakes Are Applied

Washing the Brooklyn Tunnels Prevents Delays from Electrical Trouble

BESIDES three bridges in New York City between Manhattan Borough and Brooklyn and Queens Boroughs, three under-river tunnels also are used by the trains of the New York Rapid Transit Corporation, the Brooklyn-Manhattan Transit Corporation's subsidiary. These tunnels are located at the Battery (Montague Street tunnel), Fourteenth Street and 60th Street in Manhattan. Each consists of two separate tubes made up of rings of cast iron in the under-river portions. The oldest of these tunnels, which is the Montague Street, has now been in service since 1920, or nearly six years.

Until recently the dirt which collected in the tunnels was removed by "dry cleaning" methods; that is, by hand labor. But the tubes kept getting dustier and dustier, not only because of dust blown in from the land sections but from brake shoe dust, due to the application of the brakes on the down grades.

While the conditions were not bad from a merely transportation standpoint, they were serious electrically. The dust settled on and around the third rail insulators and cables. When dampened by moisture from water leaking into the tunnel it made a strong, dense coating which was hard to remove. As it could not be wiped off with rags, wire brushes were required to get it off. On account of the large proportion of brake shoe dust, these coatings were electrical conductors, and it was therefore necessary to remove them frequently and if possible to prevent their formation.

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While very little trouble was experienced from this dust during the first few years of operation through the tubes and there was no serious delay, yet minor delays were caused by it, and the cleaning of the third rail insulators and other third rail equipment became an expensive item of maintenance. The insulators were gone over every three months, generally requiring the services of two third rail gangs for three consecutive nights in each tube each time they were cleaned. As it was generally possible for the men to work in the tunnels only between the hours of 1 a.m. and 5 a.m., the progress was slow and the costs comparatively high, as the men had to be paid for the entire night's work. Furthermore, the dust was not being removed as fast as it accumulated and, with the lapse of time, it was becoming more and more troublesome.

In order to secure a more nearly complete removal of the dust and dirt the building division of the railway installed two 2-in. pipes, one in each tube, the entire length of the under-river section, a distance of approximately 1¼ miles. These pipes were connected to the city water mains at each end and were provided with valves and hose connections at intervals of 200 ft. The cleaning was done by two gangs of men, one gang working from each side of the river and meeting in the center. Although the water pressure varied considerably at different points in the tunnels and under different conditions, it was found to average about 85 lb. With that pressure there was no trouble in washing down the roof, sides and bottom of the tunnel, the water after use flowing along a gutter in the center of the track to drains, from which it was pumped out into the river.

In the cleaning of each tube about 800,000 gal. of water was used and it took six nights for the gang to go through. But when the work had been completed there was a marked improvement in the appearance and conditions of the tubes. More than 125 bbl. of dirt was collected and carried out in addition to much that had remained in suspension in the water and had been pumped out. It was found that very little water had got into the lighting conduits or fixtures and only a few of the latter had to be replaced on account of the cleaning.

Tri-City Trainmen Sign After Reading Bulletins

UNTIL recently it was found almost impossible by the Tri-City Railway of Iowa to impress upon trainmen the importance of looking at the bulletin board for new bulletins before taking out their runs. Equally difficult was the task of seeing that they signed the report after having read the bulletin. A register sheet of the type shown in an accompanying illustration has solved both problems. When a new bulletin is

Form 1062 A Order 9732

TRI-CITY RAILWAY COMPANY
OPERATOR'S REGISTER SHEET
Date

LINE	RUN NO.	CAR NO.	HAVE READ BULLETIN NO.	REGULAR	EXTRAS	OUT	IN	TOTAL
BRIDGE LINE	1		267					
	2		267					
	3		267					
	4		267					

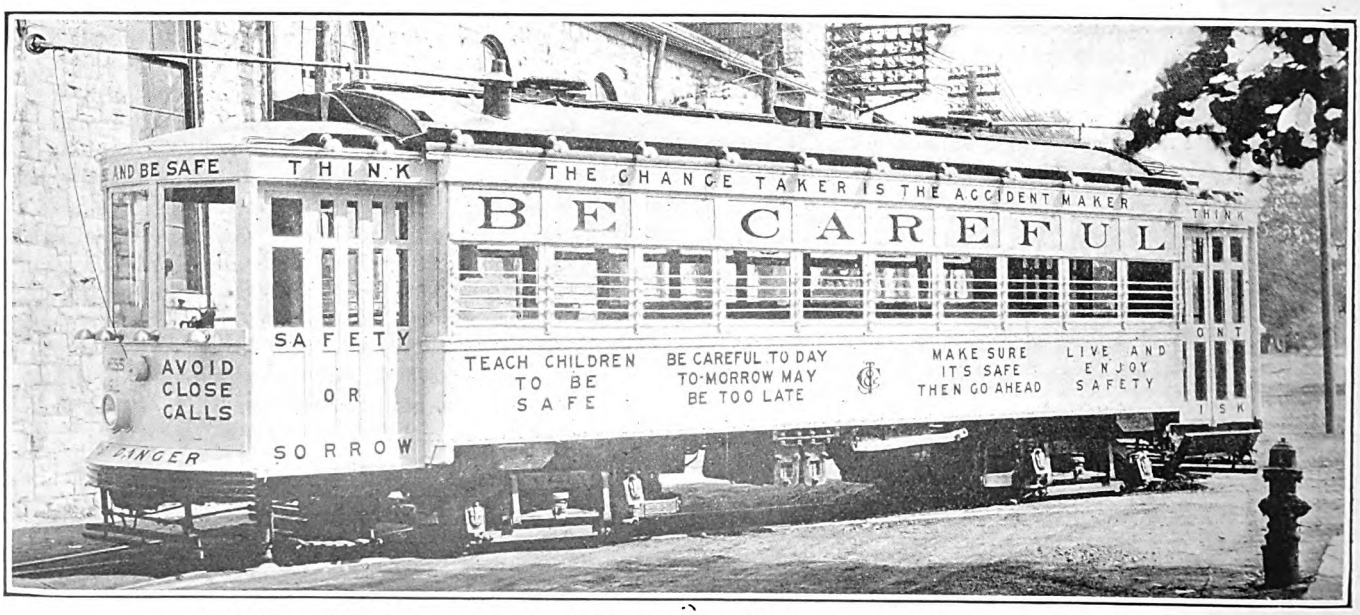
Trainmen Must Sign This Sheet to Show They Have Read the Latest Bulletin

posted the number of it is stamped opposite each run number on the sheet; when the trainman registers, his attention is called to the bulletin. It has been found that the bulletins are always read now. Trainmen must sign as having read it before they receive their pay. This column of the register sheet is left blank only when no new bulletins have been issued.

Railway Aids Safety Drive at Joliet

DURING the safety week held at Joliet, Ill., May 23 to May 29, the Chicago & Joliet Electric Railway co-operated by repainting one of its city cars and using it for the display of appropriate slogans. The background color was old ivory, while the lettering on the dashers, sides, etc., was black. This car was operated in regular service on various lines in the city and attracted much attention.

Police records show that only four persons were injured in Joliet during the several days of the campaign, which was considered a good showing.



A Traveling Advocate in the Cause of Safety Operated by the Chicago & Joliet Electric Railway

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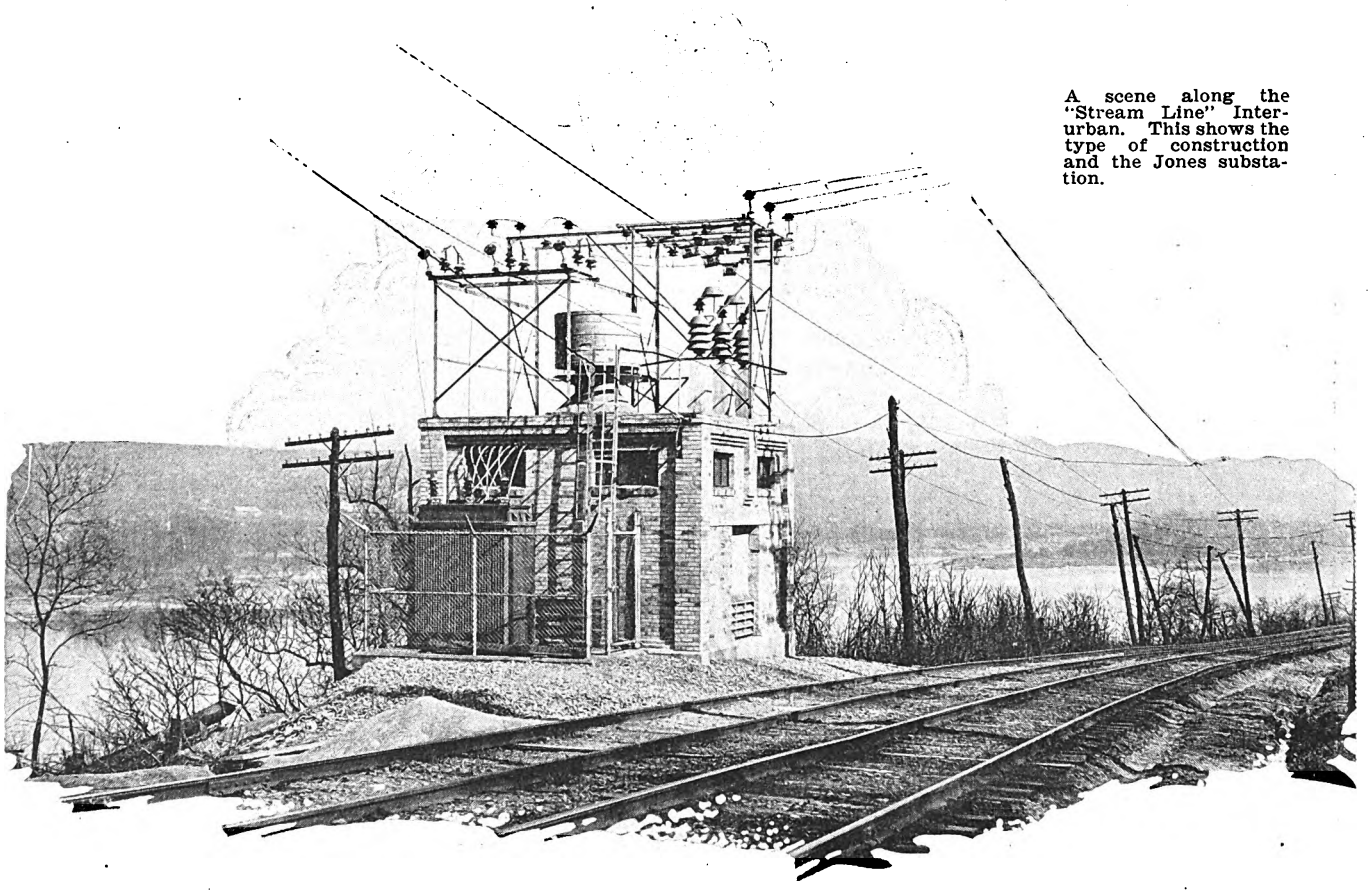
One Owner's Faith in the Trolley

FIRST ARTICLE

After Others Lost Hope, C. A. Smith Made "Stream Line" Interurban Successful—Straighter Track, Higher Speed, Greater Safety and More Attractive Cars Have Helped Bring About the Improvement



A scene along the "Stream Line" Interurban. This shows the type of construction and the Jones substation.

FURTHER proof that the electric railway is out of date only when it stands still or slides backward is found in the story of the rejuvenation of the Steubenville, East Liverpool & Beaver Valley Traction Company. For all its impressive length of title, the railway's interurban trunk line itself is of that shortness which has been declared hopeless in the face of automobile and motor-bus competition. Indeed, the property is but 43 miles long, between Beaver, Pa., and Steubenville, Ohio. Of this route, 2.5 miles between Vanport and Beaver forms a part of the Beaver Valley Traction Company, which operates city service over the joint section.

In addition to the interurban, city service is given in East Liverpool, Chester, W. Va. (opposite East Liverpool), Steubenville and, since Jan. 10, 1926, within Toronto on the main-line track. Other local services along the main line are given from Midland, Pa., as far as Wellsville, Ohio. The territory served, particularly around East Liverpool and Chester, is noted as the greatest tile and pottery district of America; but steel and tinplate mills, as well as coal mines, are also large employers of labor in this area.

One fortunate feature of the road itself is that it was built as a double-track interurban from the start. Of its 40 miles or so of directly-owned trunk line, less than 2 miles is single track. With the various route changes of recent years completed, the company will also be in the happy position of having 72 per cent of its interurban route on private right-of-way. Attainment of this proportion under the topographical conditions existing is a real achievement. The route follows the Ohio River very closely through a land full of steep bluffs that often come almost to the water's edge. Therefore, changes in route are not made so readily as on flat terrain. Even as it is, the railway is compelled to follow the one and only through highway for several miles through the longitudinal communities served.

Finally, before entering on the account of this railway's griefs and apparent salvation, it is well to summarize the population to secure some idea of the business opportunities. The number of inhabitants in each community is presented in an accompanying table.

It will be seen from the table that the population served along or near the company's lines exceeds 96,000. Adjacent to the Beaver terminus are a number of small communities which are not closely related to the activities between Beaver and Steubenville, such as: Rochester, 6,957; East Rochester, 400; Monaca, 3,838; Freedom, 3,000; Conway, 1,200; and up the Beaver

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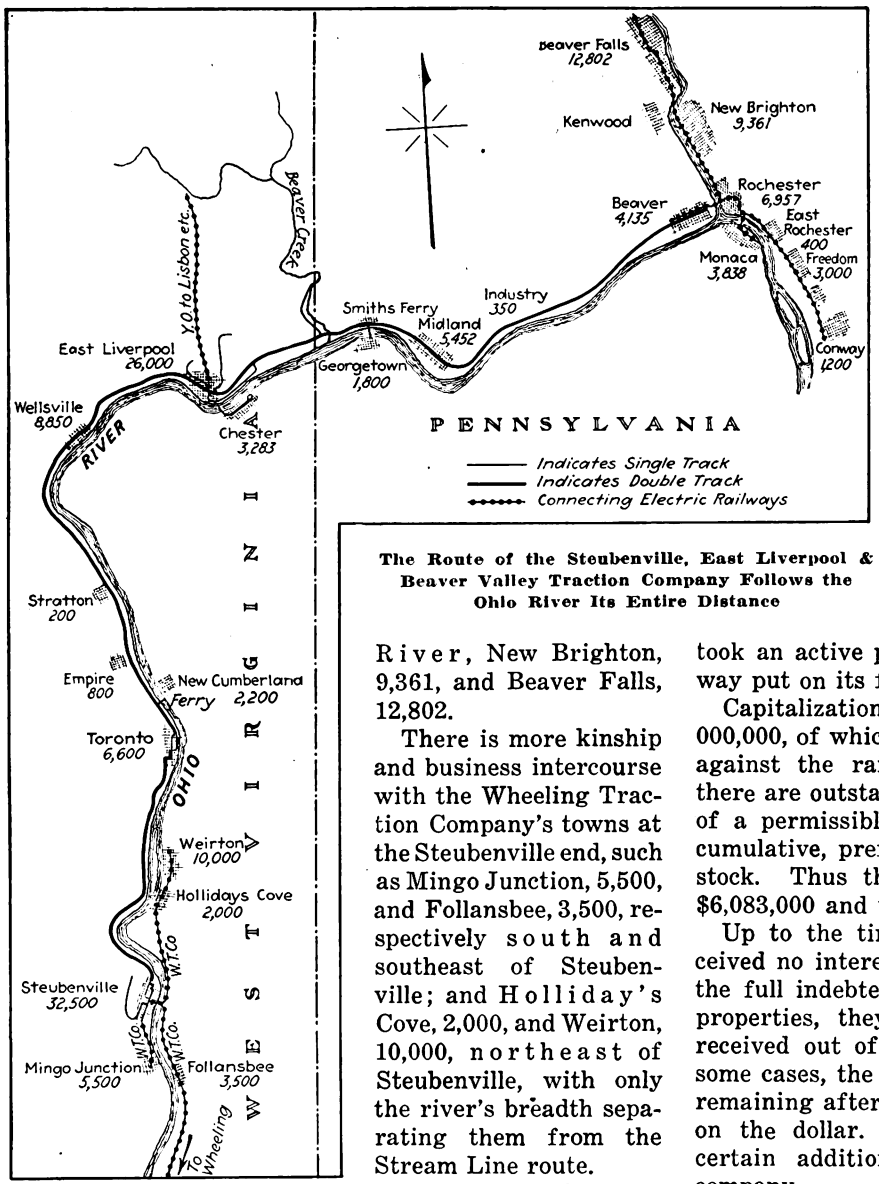

The Route of the Steubenville, East Liverpool & Beaver Valley Traction Company Follows the Ohio River Its Entire Distance

River, New Brighton, 9,361, and Beaver Falls, 12,802.

There is more kinship and business intercourse with the Wheeling Traction Company's towns at the Steubenville end, such as Mingo Junction, 5,500, and Follansbee, 3,500, respectively south and southeast of Steubenville; and Holliday's Cove, 2,000, and Weirton, 10,000, northeast of Steubenville, with only the river's breadth separating them from the Stream Line route.

Thus the nearby population of the Beaver Valley Traction Company's system totals 37,558 and of the Wheeling Traction communities 21,000—a total of 58,558 within likely commuting distance for jobs in this territory.

Troubles Began Before the World War

Up to the year 1911 the territory was served by three non-competitive railways, from Vanport to the Pennsylvania-Ohio state line; from the state line to the west end of Wellsville, Ohio; and from Wellsville to Steubenville, including local lines. In this year the railway and lighting properties of these three concerns were leased by J. G. White & Company under the corporate title of Tri-State Railway & Electric Company, a company formed to operate the lines.

The combination did not prove successful, bond interest of these three companies being defaulted on Nov. 1, 1912, and a formal receivership declared in March, 1913. The bondholders of the three companies instituted actions to secure cancellation of their leases, but operation of the property as a unit was continued except for the group of lines at East Liverpool, in which a local man, C. A. Smith, had acquired an interest.

The more active participation of Mr. Smith in the traction problem was due in large measure to his extensive property interests in the territory. He was not new to public utilities, having once held a substantial interest in the East Liverpool gas property, but he had turned to other activities. When he entered the railway field in the depression that was coincident with the opening of the war, he had no illusions about making money from that source. He did believe, however, that reliable transportation had to be given if his investments and those of his neighbors were to grow and prosper.

The first step was to merge the three railways. This was achieved by Nov. 1, 1917. In carrying out the merger two important changes were made: First, the light and power portions were sold, and, second, the capitalization was scaled down, partly to allow for the simplified conditions and partly to reduce the overhead charges per mile. In this reorganization Mr. Smith took an active part, as he was anxious to see the railway put on its feet as quickly as possible.

Capitalization of the original companies totaled $14,000,000, of which $9,000,000 to $10,000,000 was charged against the railway portion. In the reorganization, there are outstanding $1,483,000 bonds at 5 per cent out of a permissible $3,000,000; $2,600,000 in 5 per cent cumulative, preferred stock; and $2,000,000 in common stock. Thus the present actual capitalization is only $6,083,000 and the authorized capitalization $7,600,000.

Up to the time of the merger, the bondholders received no interest. As these bondholders had assumed the full indebtedness of the original light and railway properties, they were assigned whatever sums were received out of the sale of the lighting business. In some cases, the pro rata distribution of the cash assets remaining after liabilities amounted to but 7 or 8 cents on the dollar. However, these bondholders received certain additional values in securities of the new company.

This liquidation was not completed until about November, 1925. In the meantime the bondholders had run into other misfortunes. The merger company began well enough by paying interest regularly. This continued until May 1, 1922, but as higher expenses had come much faster than approval of higher fares, there was no reserve to meet the calamity of a 51 weeks strike.

Parenthetically, it may be recorded here that the same spirit of enterprise and loyalty to public interest shown by the management is reflected today in the rank and file—"the ride salesman."

POPULATION OF TOWNS SERVED BY THE STEUBENVILLE, EAST LIVERPOOL & BEAVER VALLEY TRACTION COMPANY

Beaver, Pa. Through riders from steam railroad and Beaver Valley connections, as well as local riders to industries along the interurban	4,135
Industry, Pa.	350
Midland, Pa.	5,452
Smith's Ferry, Ohio, and George Town, Pa., combined	1,800
East Liverpool, Ohio, and suburbs. Connections with Youngstown & Ohio River Railroad interurban	30,000
Chester, W. Va. Opposite East Liverpool	3,283
Wellsville, Ohio	8,850
Stratton, Ohio	200
Empire, Ohio	800
New Cumberland, W. Va. Opposite Calumet, Ohio	2,200
Toronto, Ohio	6,600
Steubenville, Ohio	32,500
Total served directly or by ferry	96,170

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Resumption of bond interest was out of the question in the year or two following the reopening of the railway. Too much had to be done to make up for deferred maintenance and to meet the new menace of the ubiquitous automobile on rapidly improving highways. Bond interest assignments were far from adequate for the purpose, so C. A. Smith, the lone optimist among the owners, began to lend his personal credit to the rehabilitation program.

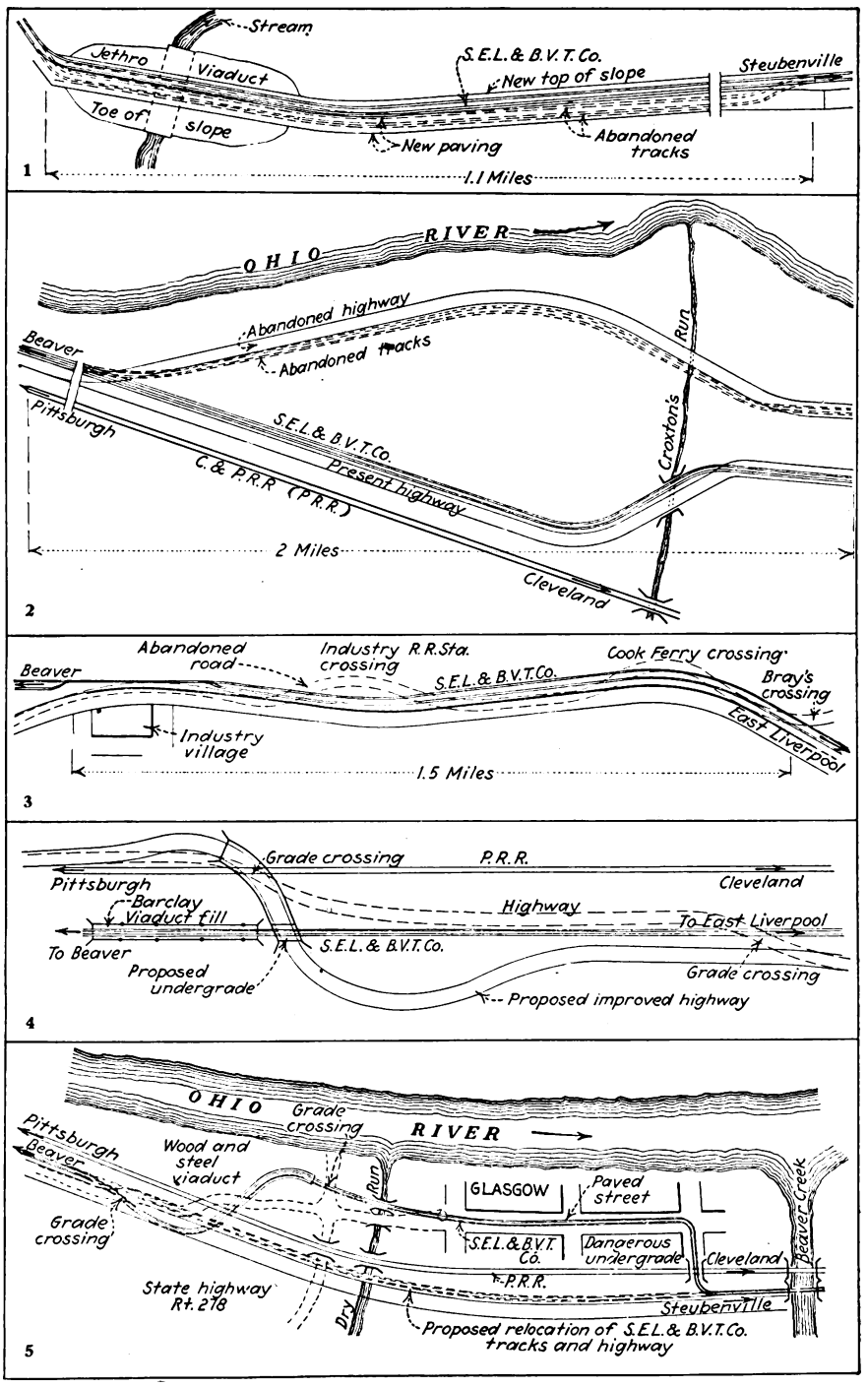
Thus it came about that by January, 1925, Mr. Smith was in a position to buy out enough partners in the enterprise to give him a major interest in the three forms of securities. From that time on the work of improvement was so accelerated that by last September he could say: "Now that I've got a good railway, I'd better get me someone to capitalize on these betterments in an operating way." Thereupon, he invited Garry S. Wills, then general manager of the neighboring Wheeling Traction Company, to manage the property with the title of general superintendent. While Mr. Smith retains the title of general manager, he plans to give most of his time to the direction of his other extensive interests.

A Quarter Million for Straighter, Safer, Faster Track

From the first, Mr. Smith's idea has been to get away from the expense of operating over paved streets or over viaducts when private rights-of-way constructed by cuts and fills can be made to pay better through lower upkeep, higher speed, more attractive service and fewer accidents through collisions.

So as early as 1921 the line was straightened at Jethro by leaving the highway for 1.1 miles and running over a fill instead of a viaduct. In 1923, 3 miles of paved highway between Jeddo (just south of Toronto) and King's Crossing was exchanged for private right-of-way. In 1923-1924, 2 miles of highway was left between Calumet and Myers Lane, adjacent to Jeddo. The paving charges here were met by arrangement with the Ohio River Edison Company, which had purchased land along the river, thereby causing transfer of the railway to a new and straighter right-of-way farther from the bank.

In 1924-1925, 1.5 miles of highway at Cook's Ferry was left. A trestle at Barclay, near Industry, was superseded by a fill. In 1925-1926, more than 1.5 miles of route east of Smith's Ferry was taken in hand. In this section, one viaduct, one trestle over-crossing and one under-crossing are being removed and 8,000 ft. of track altogether taken off of the highway.



Some Examples of Relocation Along the Line

1. Along West Eighth Street, East Liverpool, the tracks have been taken off the highway.
2. At Calumet both highway and tracks have been straightened.
3. Between Industry and Bray's Crossing several railroad crossings were eliminated.
4. At Barclay a viaduct and fill have permitted straightening of the line.
5. The proposed relocation at Smith's Ferry will improve operation greatly.

During 1926 about 1.4 miles of route will be taken off of the highway in the second zone out of Steubenville, viz., between Stop 7 and Castner's, thereby eliminating three highway crossings. Because of this change, the upkeep of about 1 mile of paving from Crawford Avenue, Steubenville, to Castner's (in Jefferson County) will be eliminated. The greater part of the improvements described will be found pictured in the accompanying group of five drawings.

To summarize: About 11.5 miles or approximately 25 per cent of the interurban route has been or is being improved at a cost of $250,000. The net result will be

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a permanent reduction in paving obligations and of the troubles incident to unattractive speeds and the presence of accident-breeding vehicles.

Looking at these betterments from the standpoint of possible competition from motor buses in interstate operation, this can be said: Only the trolley will be able to give high speed with safety because about three-quarters of its operation will be on private right-of-way, whereas the motor bus must stick to the public highway and jeopardize its patrons to give really fast service and adhere closely to a schedule.

By December, 1925, also, the company completed the rehabilitation of its La Belle View line in Steubenville. By spring, a 1,400-ft. loop extension will be finished to take in a fine, new housing area.

In all paved work, the company's standard construction is 93-lb. T-rail on a concrete foundation with brick or concrete surfacing. Tracks of the company are standard gage, 4 ft. 8½ in., but a gauntlet rail is used between Vanport and Beaver because of the 5 ft. 2½ in. gage of the Beaver Valley Traction Company.

Improvements in Overhead, Signals, Etc.

On account of the many localities where corrosive smoke is prevalent, Copperweld strand wire has been adopted to replace ordinary steel strand span wire. The latter averaged a life of six months; Copperweld has already done better than two years in like situations. While the No. 00 trolley remains standard, it is being supplemented with additional feeders.

One of Mr. Wills' first moves to take advantage of the improved track and line conditions with maximum safety and for better speed was to install Nachod type CD automatic signals in place of those of the hand-throw variety. These signals are used not only on single-track sections, but also on double-track sections where they serve for car spacing. The single-track signals are intended to care for as many as fifteen cars in a block.

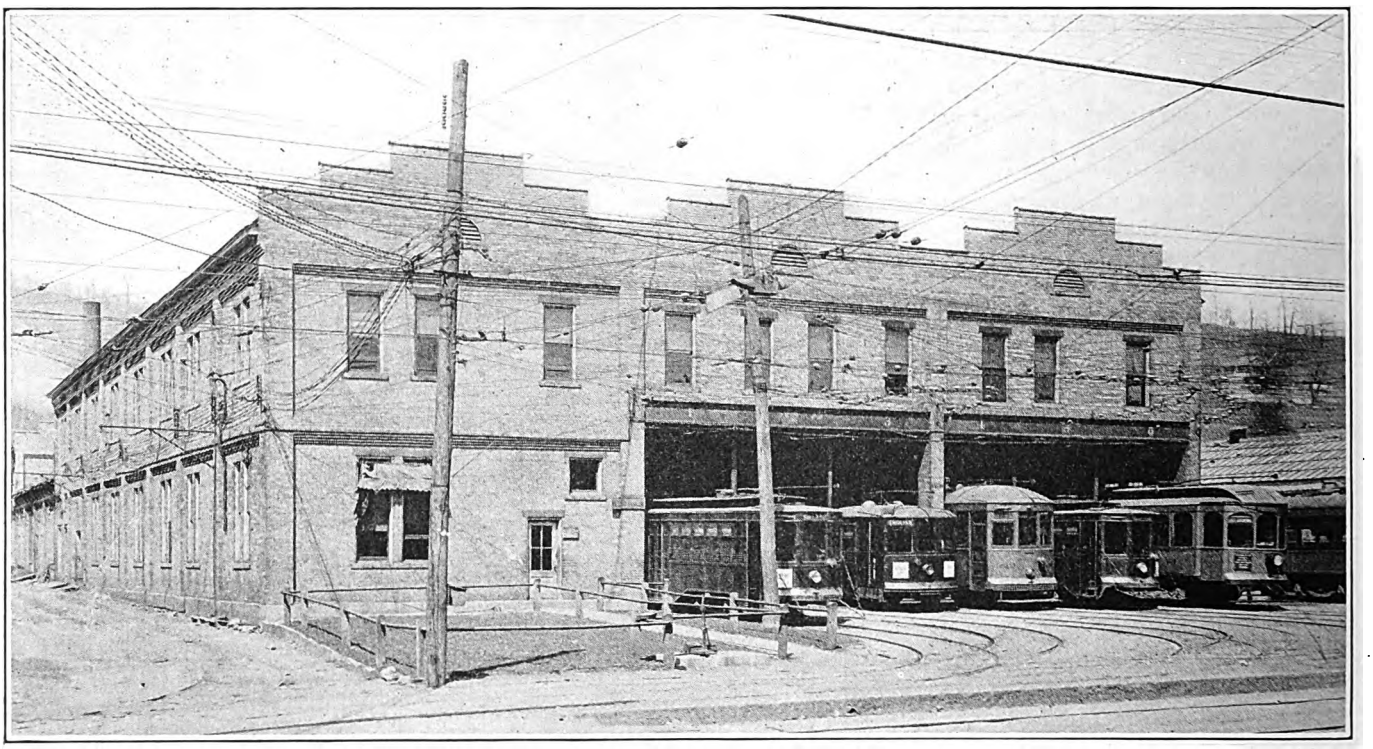
To the three Cheatham automatic track switches installed earlier two more have been added to speed up and simplify one-man car operation, and in one instance to eliminate two switchmen. Two of these switches are on local branch lines.

Telephone dispatching has been in use for twelve years past on the main line. Operators of local cars can secure instructions from the dispatcher by means of railway telephones in the downtown terminals, but they are also trained to make calls over the Bell system from any part of their runs.

Automatic Substations Produce Excellent Power Condition

Power had been purchased from the American Gas & Electric Company under a contract which was due for revision in 1922, but the matter was postponed until April, 1923, because of the strike. The railway was then served by four manually-operated substations owned by the power company and one automatic substation owned by the railway. As early as 1921 the Westinghouse Electric & Manufacturing Company had arranged with Mr. Smith for automatic operation of one of its two units at the Industry substation, the second remaining in reserve for manual operation. Eventually, the Westinghouse company secured a contract for the equipment of seven railway-owned automatic substations, the first of their kind with complete electro-pneumatic switching equipment. This important installation will be treated separately in a forthcoming issue. It need only be stated that the excellent voltage conditions now obtaining are also helping toward the goal of higher speed and brighter illumination of the cars.

Ample power is not inconsistent with safe and economical use thereof. It is of interest to note, therefore, that since August, 1925, Economy meters have been installed on all cars of the system and an energy saving campaign instigated.



The Offices and Carhouse Are Located in East Liverpool

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Improved Training for Platform Men on Third Avenue System

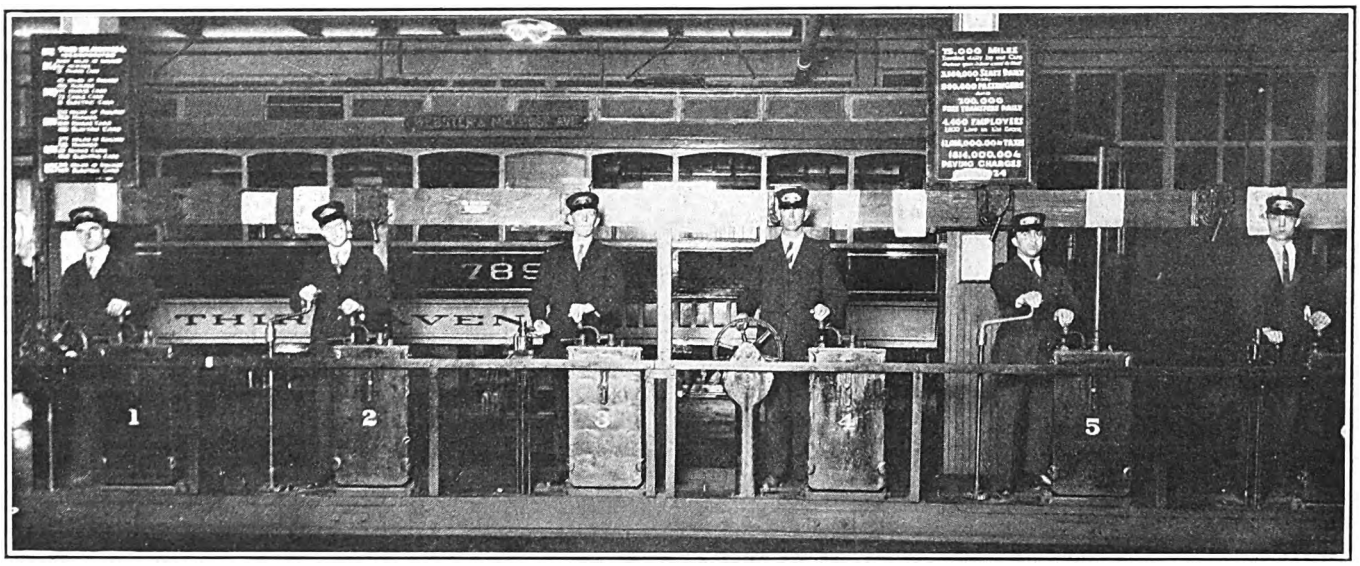
Emphasis Is Laid on Methods of Instruction as Against Selective Work—Formation of Correct Habits Used as the Foundation of the Training School Effort—Apparatus in the Schoolroom Is of Simple but Effective Character

By Dr. Christian P. Segard
Assistant Secretary in Charge of Employee-Employer Relations, Third Avenue Railway System, New York City

CONDITIONS of the labor market must largely determine the procedure to be followed in the selection and training of platform employees. In New York City there never are enough applicants for this class of work to allow of the selection of only the highest grade men. While out of every hundred men who apply only 70 are accepted, perhaps only 50 are considered of a high grade. Hence the efforts of the employment department must be devoted more along the lines of training than of selection. Many of the men are fresh from the old country. Not only are they unfamiliar with street car operation, but have little knowledge of our busy civic life and conditions as well. For such men from five days to two or three weeks additional training is often necessary.

Basically, the philosophy back of the training methods of the Third Avenue Railway System is a study of the behavior of the applicants and the formation in them of correct habits. There are three primary behaviors in human nature: (1) manual; (2) verbal; and (3) visceral. The first is of basic importance to the position of motorman and the second of lesser importance. For conductors, the second, behavior, is of major importance and the first is of minor value. Visceral behavior is of course beyond our control and while important can only be observed and noted.

Formation of correct habits is considered a matter of prime importance and the first duty of the training school. Good training performs a service to the men and the company as well. It reflects itself in the attitude of the men toward the public and makes for a higher quality of street car service. A careful motorman (or conductor) may reasonably be said to be one who has relatively few accidents. A good conductor is one who performs his required duties with minimum friction with the public.



Six of the Bank of Nine Dummy Controllers Used in the Training School of the Third Avenue Railway System, New York. The Different Controller and Brake Types Used on the Property Are Set Up in the School

Knowledge that the condition of the applicant, mental as well as physical, meets the specifications of the job is the first essential. The training school's minimum requirement for admission is as important as any school examination. Shortage of men is the only reason for lowering the standard of acceptance. This involves far more intensive training methods and follow-up checks to be certain that no unfit men are retained in the service.

The instructors should, as a matter of course, be men who know operating conditions. But it is just as important that they have the ability to impart that knowledge to others. The theory that a good player makes a good coach is not always true. A stumbling block over which instructors sometimes fall is that the lecture or demonstration becomes an old story. They must realize that it is a new story to each student. Another

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stumbling block is when road instructors and school instructors teach differently. For example—if four steps are necessary to perform a certain act and these are taught in the school in the order of first, second, third and fourth, then the same procedure must be followed by the road instructors. A habit can never be formed correctly by making changes in method during the process of its formation.

For the training school a well-planned and carefully-arranged course in theory and practice is of great importance and it should be detailed on paper so that everything is included that is useful. By this means repetitions are prevented, unavoidable changes in instructors, as due to sickness, do not cause loss of time or knowledge to students, and new ideas can be inserted in the text when it is found desirable.

The text of the instruction course used on the Third Avenue System is divided into two parts, those for conductors and motormen. Each of these is again divided into theory and practice. The amount of time allotted to each subject is prescribed, with the number of days and hours that an experienced or an inexperienced man is allowed to "break in" on each line of the division to which he is assigned. Curriculum schedules used are shown herewith.

The equipment of the school consists of four sep-

Abstract of Curriculum of Training School for Motormen and Conductors Used on the Third Avenue System, New York City

This definite program makes the work uniform and avoids changes or omissions due to a change of instructors

Student Conductors' Curriculum

Days—Tuesday and Thursday. **Time**—8:15 a.m. to 1:00 p.m.

Purpose	Fifteen minutes.	One period.	
Courtesy	Fifteen minutes.	One period.	
Miscellaneous Rules	Thirty minutes.	One period.	
Collecting and Registering Fares	Thirty minutes.	One period.	Theory.
Fare Boxes and Registers	Fifteen minutes.	One period.	
	Theory—five minutes.	Practice—ten minutes.	
Day Card	One hour.	One period.	
Transfers	Fifteen minutes.	One period.	
Free Riders	Five minutes.	One period.	
Accidents	Thirty minutes.	One period.	Theory.
Hand Brakes and Circuit Breakers	Twenty minutes.	One period.	
	Theory—ten minutes.	Practice—ten minutes.	
Car Equipment	Ten minutes.	One period.	Theory.
Stopping Car At Rear End	Five minutes.	One period.	Theory.
Hand Plow	Ten minutes.	One period.	
	Theory—five minutes.	Practice—ten minutes.	
Double-Throw Switch	Five minutes.	One period.	
Opening and Closing Doors	Five minutes.	One period.	

Approximately 60 hours actual work on a car on the lines of his division with a qualified instructor.

The topics discussed under the above headings are outlined in the attached supplement.

SUPPLEMENT TO STUDENT CONDUCTORS' CURRICULUM—TOPICS

Purpose—Knowledge of the rules.

Courtesy—The idea of selling the service by being polite at all times. Being agreeable, helpful, kind and considerate to all passengers. Seating passengers—cripples and infirm.

Miscellaneous Rules—Obedience; reporting for duty; uniform; bulletin board; personal appearance and habits; assignment of wages; time pieces; waiting at intersections; stopping places; making announcements; requesting passengers to move forward and leave by front door; transferring passengers from disabled car; conversation; lost property; bulky and objectionable packages; delivering newspapers; peddling and begging; smoking on cars; spitting; ventilation; passing obstructions; bell signals; route and destination signs; advertising signs; trimming cars; backing cars; pushing stalled cars; conductor's position on car; delays; keeping car clean; extinguishing lights.

Collecting and Registering Fares—Passenger must drop fare in box, and registered at that time. Conductor not allowed to drop fare in box for passenger. Making change: what to do when too much money is dropped in box; what to do when unable to make change. Three dollars in change when starting out and warning always to count and know exactly how much he has when starting out: what to do when over in money at end of day's work; children under four. Cash tickets. What to do when passenger refuses to pay for a child four years or over. Turning in receipts.

Day Card—How it should be filled out. Student making out a sample card.

Fare Boxes and Register—How they work, and what they register. How to ring up fares: proper setting of trip indicator; what totalizers mean; bunching fares; examining seal on box. Compare fare box and register reading with reading on record card. What to do when fare box or register is out of order. When register is reading wrong.

Transfers—Proper method of punching; punching twice; not punching; when to issue; proper returns; void transfers and what to do; wetting fingers and holding transfers in mouth. Emergency tickets. What to do when short.

Free Riders—Who they are—police, firemen, pass holders, mail carriers.

Accidents—Definition; different type; information; witnesses; business address; opening up line; emergency phone call; calling ambulance; notifying report clerk, starter, inspector; contributory negligence; the report; ejectments.

Hand Brakes and Circuit Breakers—How to use a hand brake. How to set and trip circuit breakers; their use.

Car Equipment—The trolley pole; plow; trolley catcher; dash; headlight; bumper; drawhead and drawbar; wheel guards.

Stopping Car At Rear End—How to cut power off from rear end—by opening door, tripping circuit breaker or by pulling down trolley pole, and putting on hand brake.

Hand Plow—What it is—its use and how to use it. How it should be connected to controller, ground plugs, or double-throw switch, with warning to trip front and rear circuit breakers when connecting hand plow leads to controller or ground plugs. How to connect hand plow to channel rail.

Double-Throw Switch—What it is, and where it is on the car. How to throw it and when. Warning never to throw same unless door is open.

Opening and Closing Doors—How to operate them. Warning not to open until car has stopped; to look out before closing, see if everyone is clear of step, never close door in passenger's face; getting handle back all the way so that step is down flat. Warning not to push with left hand on the glass; seeing that safety catch is over foot pedal on rear exit door.

Student Motormen's Curriculum

Days—Monday and Wednesday **Time**—8:15 a.m. to 12:00 n. 1:30 p.m. to 4:30 p.m.

Purpose	Ten minutes.	One period.	
Hand Plow	Twenty minutes.	One period.	
	Theory—ten minutes.	Practice—ten minutes.	
Door Sheet	Fifteen minutes.	One period.	
	Theory—five minutes.	Practice—ten minutes.	
Controller	Two hours.	One period.	
	Theory—one hour.	Practice—one hour.	
Hand Brakes	One hour.	One period.	
	Theory—thirty minutes.	Practice—thirty minutes.	
Double-Throw Switch	Ten minutes.	One period.	
	Theory—five minutes.	Practice—five minutes.	
Bell Signals	One hour.	One period.	
	Theory—thirty minutes.	Practice—thirty minutes.	
Car Equipment	Thirty minutes.	One period.	Theory.
Regenerative Emergency Stop	Thirty minutes.	One period.	
	Theory—fifteen minutes.	Practice—fifteen minutes.	
Emergency Stop	Thirty minutes.	One period.	
	Theory—fifteen minutes.	Practice—fifteen minutes.	
Circuit Breakers	Twenty minutes.	One period.	
	Theory—ten minutes.	Practice—ten minutes.	

SUPPLEMENT TO STUDENT MOTORMEN'S CURRICULUM—TOPICS

Purpose—Knowledge of car mechanism.

Hand Plow—What it is—its use and how to use it. How it should be connected to controller, ground plugs, or double-throw switch, with warning to trip front and rear circuit breakers when connecting hand plow leads to controller or ground plugs. How to connect hand plow to channel rail.

Door Sheet—What it is. When and how to sign up cars.

Controller—Definition. How to feed it. Type, points, difference between running and resistance points? Saving power.

Hand Brakes—How to use a hand brake.

Double-Throw Switch—What it is and where it is on the car. How to throw it and when. Warning never to throw same unless door is open and car at a standstill.

Bell Signals—What 1, 2, 3 and 4 bells mean and what to do.

Car Equipment—The trolley pole; plow; trolley catcher; dash; headlight; bumper; drawhead; drawbar; wheel guards; trucks; driving wheel; pony wheel; emergency door switch; sand bin; sand boxes.

Regenerative Emergency Stop—How to stop car without brakes and power off the line when going forward and when sliding backward.

Emergency Stop—Using power to stop car—not taking the time to trip circuit breaker but simply pulling reverse lever and throwing controller handle all the way around to the second running position.

Circuit Breakers—How to set and trip them; their use; where they are on the car.

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arate and distinct units, all in the same room. A group of students using any one of the four units does not interfere with the use of another unit by a different group. The four units are:

One 42-ft. street car complete in operating condition but with wheels blocked up so that it does not move when the equipment is operated.

One platform having installed on it the entire mechanical and electrical car equipment in operating condition so that the working of each unit may be studied separately.

One platform with one-man car equipment installed.

One unit consisting of nine sets of dummy motorman's equipment. These sets can all be used at once or separately.

Before a student motorman is sent out on the road to break in he is given instruction on all four units. The standing car gives him the "feel" of being in charge of a car and being in the driver's position. The equipment is shown to him in operating condition and he sees what happens to the machinery with each action that he will perform. The dummy controller and brakes are used to give the man experience in feeding the controller, setting up hand and air brakes and in general to make him familiar with the knack of handling the control apparatus. Each movement is at first done at the instructor's command and its result explained. After considerable instruction of this nature the applicant then goes out for road instruction on equipment in service, but in charge of student trainers, who are motormen that have qualified for this work.

When the student motorman reports back to the school he is again put at the dummy controller and the degree of his improvement noted. Here is where the kind of road instruction that he received shows itself and gives a recheck both on the instructing motorman and on the division instructor who supervised the work. In this case the dummy equipment is invaluable.

Happenings that require the motorman to be on the alert may be classified in two groups. The first comprises events of a normal character that require habitually more than ordinary caution to guard against accidents. The second includes conditions that require instant response on the part of motorman in order to prevent an accident. The "Fire Stop" is an example of the first group, and an automobile cutting short in front of a moving trolley illustrates the second.

Each one of these likely situations is summed up in a brief statement of two to six words. Each statement is painted on a piece of frosted glass and fitted into grooves in a series of five boxes which are mounted at a distance ahead of the bank of dummy controllers. While each of the statements can be seen by the operators, each box is equipped with two electric lights so that any one can be illuminated as a signal to respond to that particular event. The control of this illumination by the operator who is instructing the class is invisible and consists of five knife switches that can be operated without any visible manual effort, so that the event cannot be anticipated by the students being tested.

When the "breaking in" period is half through the first or cautionary group of events is given. The students are lined up in front of the nine controllers and are instructed to make the proper response by movement of controller and brake handle when the signal is flashed on. Much practice is given with this equipment and considerable evidence is gained in regard to the progress the students are making. At the end of the "break-in" period, the second or emergency group of signals are given. Again, the students gain practice and the instructor is able to judge what improvement the student has made. With nine controllers any number from one up to nine may be instructed at the same time.

These Sets of Signs Face the Bank of Nine Motorman Positions

Immediately facing the bank of dummy controllers is a set of signs suggesting ordinary conditions that may happen. These may be illuminated individually. They are used during the early training. These signs represent emergency conditions and are used by students after they have had actual experience under the supervision of a student trainer. Note the use of the three lower signs, common on many properties but seldom explained in training schools.

Since installing this device the company is assured of one important thing, every man knows how to make a regenerative emergency stop with his eyes shut. It is a habit. He has done it so often that he knows how.

The device has helped us in many other ways. We formerly thought we knew who were the poorest motormen in the school group. Now we know. And while our judgment was pretty good and we still use it, the device verifies and assists it. We also find that the students come to the school ahead of time in order to practice with this equipment. Furthermore, we can shift from one situation to any other situation immediately. This cannot be done with the motion picture method, since it is always the same and the events happen in the same sequence.

Some of our older men have tried it and have voiced their approval. It acts as a check on habits. It is a.

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good thing to replace a bad habit with a useful one even though the old bad one is not easily shaken off. It can be done, and we are optimistic in this belief.

Each piece of equipment used by the motormen and conductors is reproduced in the training school and its use or meaning explained.

As to the conductor, his main job is handling people. If they were all one kind it would be easy. But this is not the case, so we are trying to train him into a realization of this fact. Can we get him into the habit of being courteous to all? I not only think so, but know so. We can in the training school give him a lesson in loading his car, being courteous and in not arguing with passengers. The most difficult job in the world is handling all kinds of people and handling them right. And the conductor can be taught the habit of courtesy.

Today I can point to a number of our platform men who, when I meet them on the car or at the office, tell me of how tactfully and courteously they met certain situations—and they were proud of it. The hardest job in the world becomes the easiest through courtesy, kindness and tact. And some of our platform men see it. Many times they get the worst of the bargain. Passengers forget themselves and are difficult to handle. The emotional bumps from words sometimes cause more damage than physical bruises and cuts. The greatest and most effective piece of public relations work that I know of is secured by courtesy and tact on the part of the uniformed employee. And it can be made a habit on his part by the training school.

Naturally, the proof of the pudding is in the eating. We feel sure that a better class of men is being turned out and that fewer accidents result. With the results showing only on the new men on the system and the pending accident cases extending back over months or even years, it is too early to claim tangible results in dollars and cents. Another year or two and results along these lines are sure to follow. Today we notice improvement in accident records and a great reduction in the number of complaints. That can be attributed to the work of the training school.

As often is the case in real accomplishment, the credit for success lies in co-operation. The improvement in personnel work here shows the close harmony of thought and action on the part of members of the transportation department and the personnel of the training school.

A Whole Convention Moved by Interurban

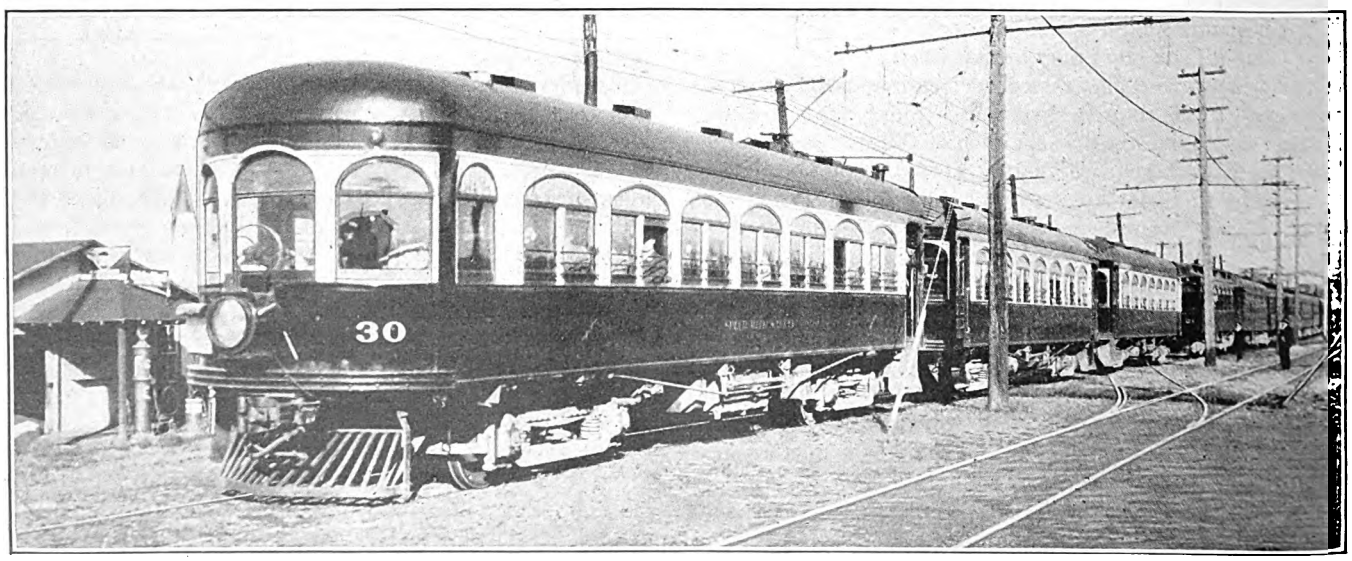
BY A. J. ROWE
Northern Texas Traction Company, Fort Worth, Tex.

IT BECAME known to the Northern Texas Traction Company in June, 1925, that the Coca Cola Bottlers' convention was to be held in Dallas in March, 1926, coincident with the Southwestern Exposition, Fat Stock Show and Rodeo to be held in Fort Worth. This situation appealed to the commercial instinct of the Northern Texas officials, and after considerable negotiation with the Atlanta office of the Coca Cola Bottlers' Association, the Baker Hotel in Dallas and the Rodeo officials in Fort Worth, the company was successful in getting the contract to move the entire convention, consisting of 450 delegates, from Dallas to Fort Worth and back again the same day. After this was decided, the Fort Worth Coca Cola Bottlers decided that it would be a good plan to entertain the convention at the Fort Worth plant with an elaborate barbecue. This necessitated not only handling the crowd by special interurban cars from Dallas to Fort Worth, but on special city cars in the city of Fort Worth.

The movement was made at the lowest rate for round-trip service that the company could offer. The actual transportation required eleven interurban cars operated in three-car trains and one two-car train. In Fort Worth transfer was made to eleven city cars on a street where there was little other traffic. The transfer from interurban to city cars was made in ten minutes. The party then moved to the barbecue and from there to the Coliseum in North Fort Worth. After the Rodeo entertainment the interurban cars were waiting for the delegates and they were transported back to the Baker Hotel in Dallas without change.

Every transportation man will know the extensive details that have to be worked out in advance and the precision of performance necessary. This movement was further complicated by the heavier traffic during the week of the Southwestern Exposition.

The company was complimented in several written and oral comments regarding the manner in which the convention was handled in the 80-mile round trip from Dallas to Fort Worth.



An Entire Convention of 450 Coca Cola Bottlers in Transit Between Dallas and Fort Worth, Requiring Eleven Cars on the Northern Texas Traction Company Lines

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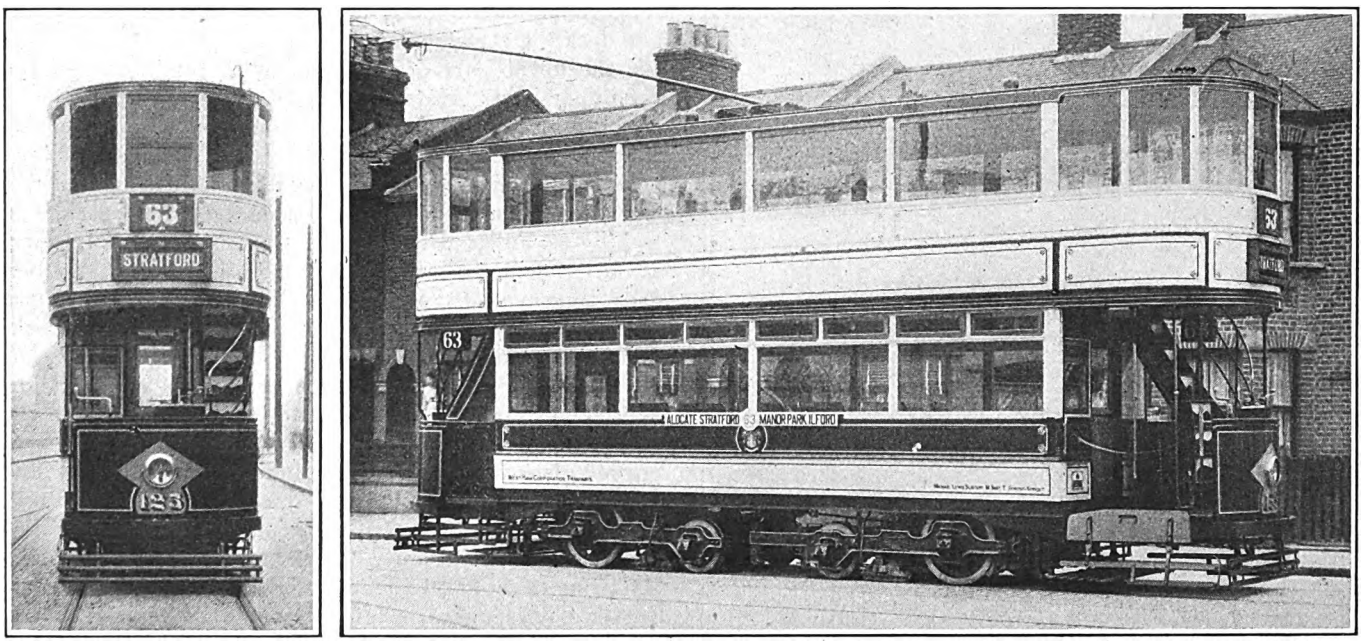
Improvement Made in Rolling Stock of British Tramways

More than Six Hundred and Seventy New Cars Included in Recent Orders—Much Reconstruction Has Been Done to Promote Passenger Comfort—Modernization of Motors Has Resulted in Greater Speed



New Car of the West Ham Corporation Tramways Is One of a Comparatively Small Number of Double-Truck Vehicles Included in Recent British Orders. At the Left Is the End View of This Car, Showing Collision Bumper That Is Backed Up by Strong Spiral Springs

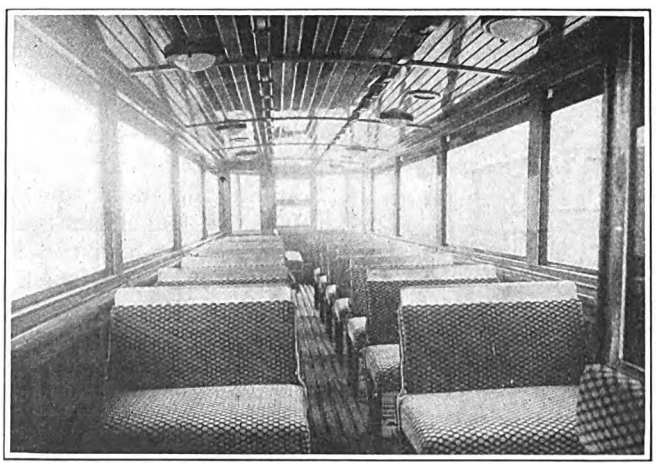
REPLACEMENT of obsolete rolling stock has made rapid progress in Great Britain since the early part of last year, the proportion of new tramway cars ordered to the total number owned being considerably greater than in the United States during the same period. New buses also have been bought in large numbers by the tramways, but the extensive improvements made in the rail equipment reflect clearly the conviction of the managements that the latter will continue to be the principal means of mass transportation.

Recent orders for new cars for the tramways alone, not including the rapid transit lines, total 679, or more than half the number of new street and interurban railway passenger cars purchased here in 1925. This ratio is particularly impressive when operations in the two countries are compared. In England some 250 "undertakings," as they are called, operate about 14,500 cars on 4,400 miles of track. In the United States some 750 companies operate 80,000 cars on 46,000 miles of track. Thus the per cent of replacement of rolling stock on British tramways was more than twice that which occurred here.

Several hundred rapid transit cars have been ordered recently by the London Underground system, and similar purchases have been made also in the United States. In the present article, however, attention will be confined to purchases of new rolling stock for the tramways.

In October, 1925, the largest purchase of new cars for British tramways in several years was made by the Leeds City Council. Many people urged buying buses to replace some of the rail lines rather than more cars, but the municipal authorities decided, after a thorough investigation of all phases of the problem, that best results would be obtained by adding to the tramway rolling stock. Accordingly, 200 new cars were authorized, 150 to be built by manufacturers and 50 to be built in the tramway shops.

When these 200 cars are placed in operation in the near future a substantial



Seats and Backs on the Upper Deck of the West Ham Car Are Spring-Cushioned and Attractively Upholstered

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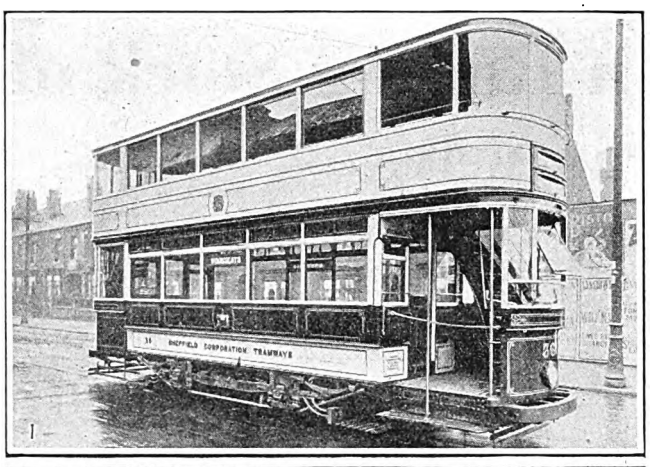

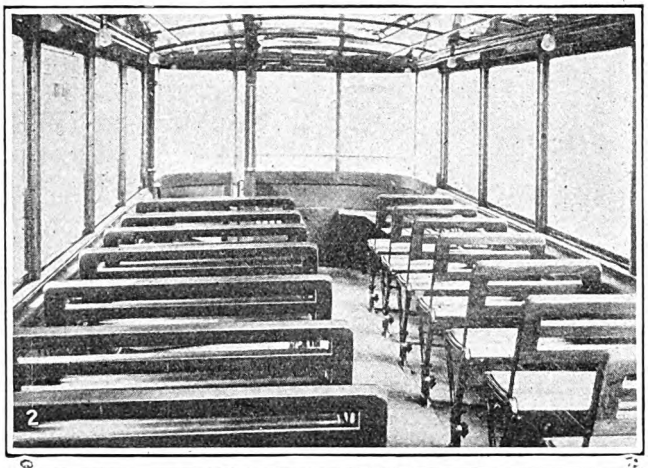

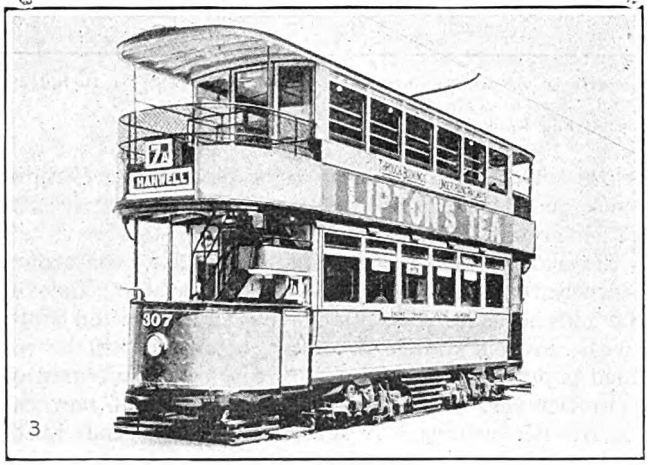

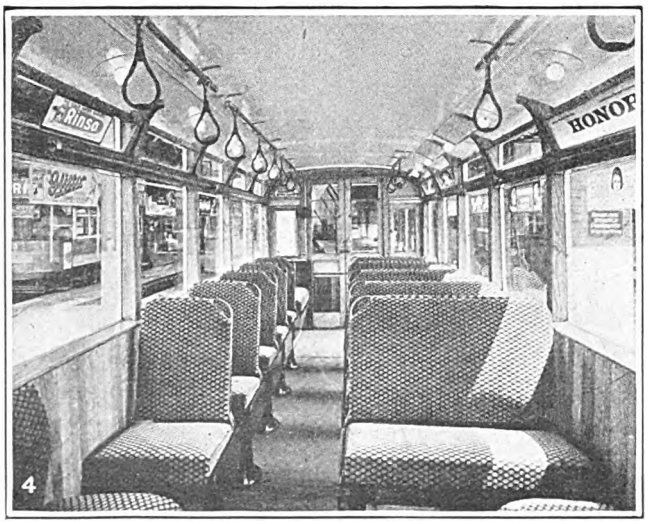

improvement will be made in transportation facilities. Leeds Corporation Tramways has approximately 117 miles of track and serves a population of about 560,000. The average number of cars in daily service is 255. The new equipment will be used in part to replace older rolling stock, and in part to give increased service.

All cars included in this purchase will be of the single-truck, double-deck type. The trucks have been so designed that the car will be able to negotiate a 29-ft. radius curve. Special care has been taken to reduce galloping motion and side oscillation to a minimum. Leather upholstered seats are provided for 72 passengers, 26 on the lower deck and 46 on the inclosed upper deck. Over-all length is 31 ft. 2 in. Teak is used for the lower part of the body, with pine and ash for the upper part. Motors are of 50 hp. capacity.

Another large order placed about the same time as that for Leeds includes 50 new cars for the Sheffield Corporation Tramways. The population served by this system is about the same as at Leeds, but the trackage is less by 83 miles, while 325 cars are used in daily operation. The new cars are of the single-truck, double-deck, top-covered type, but are slightly larger than those at Leeds, the over-all length being 32 ft. 6 in. Peckham pendulum trucks with an effective spring-base of 20 ft. are used. Motors are Metropolitan-Vickers light weight, 50 hp. rating. A great improvement from the standpoint of appearance has been made by the use of curved glass in the vestibule windows on both upper and lower decks.

Rearrangement of the seats on the upper deck has made them more roomy, but reduced the seating capacity from 48 to 40. Instead of having narrow cross-seats for two passengers on either side of the aisle, as has been the practice in the past, the new cars have a double seat, 38 in. wide, on one side and a single seat, 21 in. wide, on the opposite side of the aisle. On the lower deck seats are provided for 28 passengers, making the total capacity 68.

Last fall the Aberdeen (Scotland) Corporation Tramways put in service ten single-truck, double-deck, top-covered cars. These have a seating capacity of 64; 24 in the lower saloon and 40 in the upper. Protection for the motorman is provided by an inclosed vestibule. This practice is not yet very common in Great Britain, but such protection is particularly desirable at Aberdeen, the most northerly tramway town on the island, where the winter climate is frequently extremely rigorous. The upper half of the center vestibule window is hinged, as shown in an accompanying illustration.

Altogether 24 municipal tramway undertakings and one private company are included in the list of those which recently have bought new cars. Almost all of these are of the double-deck type, exceptions being one experimental car at Bradford, which is described in greater detail in this article, an experimental car at Glasgow, one at Halifax equipped with worm drive, and the new one-man car of the York Corporation Tramways. The single-truck type predominates to a marked

Inclosed Upper Decks Are Standard at Sheffield and London

1. Appearance of the new Sheffield cars is improved by the use of curved glass in both upper and lower vestibule windows.
2. This arrangement of seats on the upper deck of Sheffield cars has made them more roomy but has reduced the capacity from 48 to 40.
3. Standard double-truck car of the London United Tramways Company which has been re-equipped with modern motors.
4. Installation of upholstered seats in the cars of the London United Tramways is a recent innovation.

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extent in recent car orders, although there have been a number of important double-truck designs built recently. Among the latter are the cars for Birmingham, Blackpool, Bournemouth, Bradford, Cardiff, Darwen, Manchester, Plymouth, Walthamstow and West Ham. Additional details are given in an accompanying table.

Double-Truck Cars for West Ham

Last fall the Town Council of West Ham, a borough on the eastern boundary of London, placed in operation six new cars of a much improved type. This borough being adjacent to the metropolis, the general design of these new cars naturally is similar to the London County Council standard double-truck, double-deck, top-covered car. The seating capacity is 78, 32 on the lower deck and 46 on the upper. In view of the high speed of operation on this property a particularly low center of gravity has been incorporated in the design. The under frame is of heavy steel and is equipped with collision fenders backed up by spiral springs. Seats on both upper and lower decks are attractively upholstered.

An interesting new car was recently brought out by the Plymouth Corporation Tramways. Although the new vehicle is of the double-truck type and seats 70 passengers as compared with 54 in the older single-truck cars, the weight has been reduced 2,500 lb. Over-all length is 32 ft. 8 in. and the total weight approximately 24,000 lb. Motive power is supplied by two 45-hp. motors of British Thomson-Houston type. The car is remarkable for its quiet operation.

Completely inclosed vestibules are a feature of this car. The open top deck has been adhered to, partly because of the mild climate at Plymouth and partly because the track gage is only 3 ft. 6 in., and there are many sharp curves and steep grades. Under these circumstances it was desired to keep the center of gravity as low as possible. Each upper seat has two waterproof aprons, one to cover the seat itself and the other for the protection of the passenger's legs. These aprons are fastened to the seats with a spring arrangement, which causes them to return automatically to their housings when released. On account of the narrow gage longitudinal seats are used on the lower deck. An innovation, however, has been made by equipping the car with pneumatic seat cushions on both upper and lower decks. Another novel feature is that the exterior of the body is not painted but is simply varnished so that the grain of the wood is clearly brought out. This type of car is to be the future standard for the Plymouth Corporation Tramways.

The Manchester Corporation Tramways has ordered 110 double-truck cars with inclosed upper decks.

London Cars Speeded Up by Modern Motors

The London County Council Tramways, the largest undertaking in the United Kingdom, serving an estimated population of about 4,500,000 with more than 2,000 cars on 325 miles of track, has recently taken two

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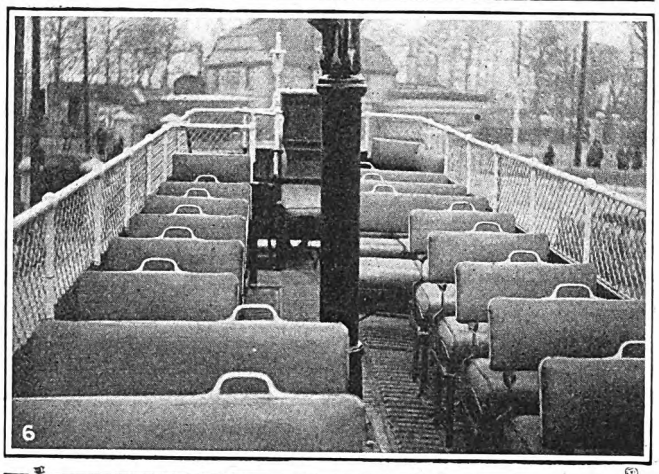
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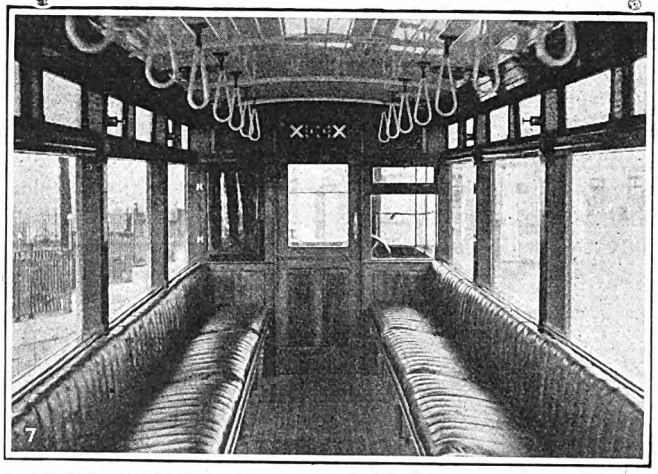
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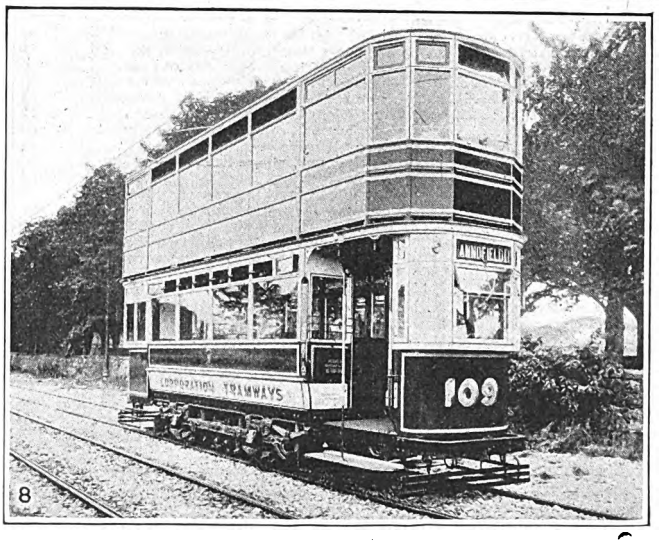

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Plymouth and Aberdeen Show Effect of Climate on Car Design

5. Completely inclosed platforms are a feature of the new car of the Plymouth Corporation tramways. The exterior is not painted but is varnished to bring out the grain of the wood..
6. An open upper deck is provided in the Plymouth car because of the usually mild climate.
7. Narrow-gage track in Plymouth makes it necessary to use longitudinal seats downstairs. These are equipped with pneumatic cushions.
8. New car of the Aberdeen Corporation Tramways has been designed to afford the motorman protection from the inclement weather of that northern Scottish town.

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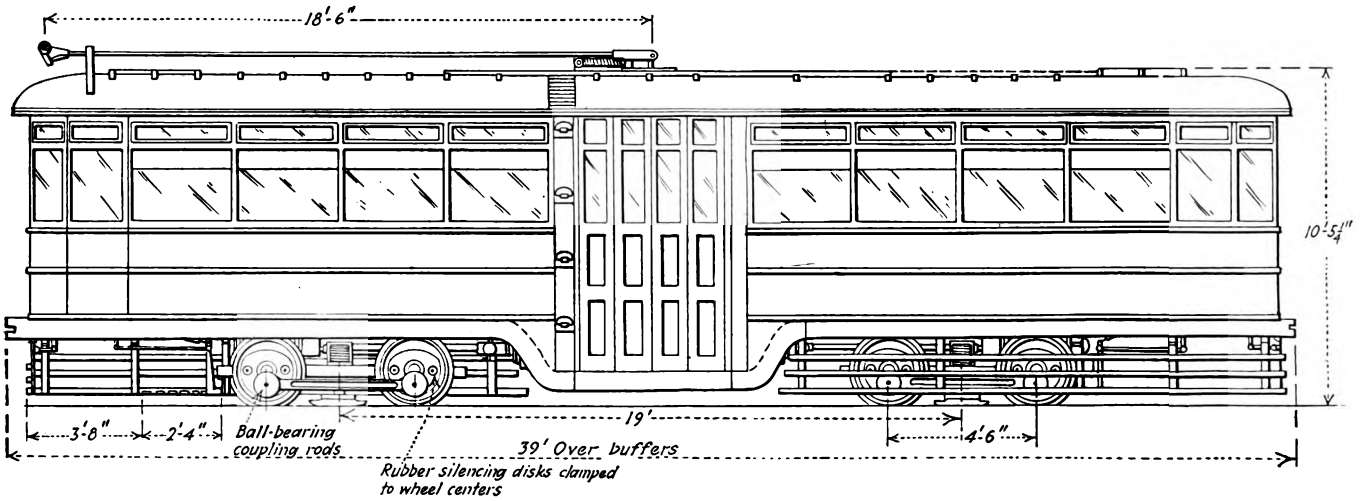

Bradford Corporation Tramways Has Departed from British Precedent in the Design of a Single-Deck, Double-Truck, Center-Door Car, as Shown Here

important steps to improve its service. These consisted of equipping the cars with more powerful motors, and providing cushioned seats instead of wood-slat seats on the lower deck. The former improvement has now been practically completed, and the average speed of cars has been increased to 9½ m.p.h. This is the highest in the country, and is about 1 m.p.h. higher than the average speed of the buses of the London General Omnibus Company. This has been accomplished even though the buses stop less frequently than do the cars because their passenger carrying capacity is considerably smaller.

Installation of cushion seats has been carried out to only a limited extent so far. If they prove advantageous on the lower deck, however, it is likely that they will be installed also on the upper decks of cars. Such a move would be entirely feasible as all of these cars have covered upper decks. Recently the London General Omnibus Company received permission to place roof covers over the upper decks of its vehicles. Probably this will lead to the use of cushion seats and the tramcars will have to follow suit, although their smoother roadbed makes this less of a necessity than it is on the buses.

Similar improvements have been made on the cars of the London United Tramways, Ltd., the Metropolitan and South Metropolitan systems. These undertakings are subsidiaries of the London Underground system and are somewhat smaller than the London County Council Tramways. Some 40 cars have been fitted with new Metropolitan-Vickers motors, and 70 equipped with the latest type of magnetic brakes. A much higher rate of acceleration has been obtained, as well as increased speed on hills. The new motors have ball or roller bearings on the armature shaft, and weigh only 39 lb. per horse-power, as compared with 81 lb. per horsepower in the case of the older motors. Improved gears and pinions have done much to reduce noise of operation.

Passenger comfort has been promoted by the substitution of cross-seats for longitudinal seats on both the upper and lower decks. These have spring cushions, and are attractively upholstered in moquette, as shown in an accompanying illustration. Lighting and other interior fittings have been greatly improved. Favorable comment received as a result of these changes has resulted in a decision, on the part of the management, to equip additional cars in the same manner.

RECENT ROLLING STOCK ORDERS

Tramway	No. of Cars	Type	Seating Capacity
Aberdeen Corp.	20	Single-truck, double-deck, covered	64
Birmingham Corp.	80	Double-truck, double-deck, covered	63
Blackpool Corp.	12	6 Double-truck, double-deck, covered	78
		6 Double-truck, toast-rack	64
Bolton Corp.	3	Single-truck, double-deck, covered	56
Bournemouth Corp.	20	Double-truck, double-deck, open	66
Bradford Corp.	1	Double-truck, single-deck, center door	56
Cardiff Corp.	85	55 Single-truck, double-deck, covered	64
		30 Double-truck, single-deck	54
Coventry Corp.	5	Single-truck, double-deck, covered	55
Darwen Corp.	2	Double-truck, double-deck, covered	72
Derby Corp.	6	Single-truck, double-deck, covered	52
Edinburgh Corp.	12	Single-truck, double-deck, covered	60
Exeter Corp.	7	Single-truck, double-deck, open	54
Glasgow Corp.	1	Single-truck, single-deck	36
Halifax Corp.	3	1 Double-truck, double-deck	64
		1 Single-truck, single-deck, worm drive	36
		1 Single-deck, standard gear drive	36
Lanarkshire Tramways	12	Single-truck, double-deck, covered	66
Leeds Corp.	200	Single-truck, double-deck, covered	72
Manchester Corp.	110	Double-truck, double-deck, covered	80
Nelson Corp.	3	Single-truck, double-deck, covered	55
Oldham Corp.	12	Single-truck, double-deck, covered	64
Plymouth Corp.	3	Double-truck, double-deck, open	70
Preston Corp.	1	Single-truck, double-deck	60
Sheffield Corp.	50	Single-truck, double-deck, covered	68
Walthamstow Council	12	Double-truck, double-deck, covered	71
West Ham Corp.	7	Double-truck, double-deck, covered	78
	1	Single-truck, double-deck, covered	60
	*10	Double-truck, double-deck, covered	69
York Corp.	1	Single-truck, single-deck, one-man	24
Total	679		

*Tenders have been invited for these ten cars, but orders have not yet been placed.

RADICAL INNOVATION AT BRADFORD

Departing altogether from established British precedent, the Bradford Corporation Tramways has designed a single-deck, double-truck, center-entrance car. The principal features of this design are shown in an accompanying illustration. In many respects the new car resembles center-door cars used in the United States. It differs from the most recent designs followed in this country, however, in that no end doors are provided and passengers must use the center doors for both entrance and exit.

The motors are spring-suspended under the center of the car body. A propeller shaft and worm gearing arrangement drives the outer axle of each truck. Wheels are connected by side coupling rods. Hand braking is accomplished by means of drums on the inside axles, while the track brake is operated by air. It is expected by the management at Bradford that this type car will prove speedier in operation than the type heretofore used.

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The Readers' Forum

Restrictions in Zion Not Illegal

THE CITY OF ZION
Lake County, Illinois

ZION, ILL., June 15, 1926.

To the Editor:

Your issue of June 12, Vol. 67, No. 24, carries the following article:

Commission Over-rules City's Bus Ordinance

An attempt to interfere with the state regulation of public utilities by the city of Zion, Ill., when it issued an order on March 29 prohibiting buses of the Chicago, North Shore & Milwaukee Railroad from stopping for passengers within its corporate limits on Sundays, was recently overruled by the Illinois Commerce Commission. That body decided that the charter granted to the utility by the state denies the right of a municipality to pass ordinances or take other measures to alter features of service as set forth therein. In response to the protests of more than 400 inconvenienced Zionites, the North Shore line appealed to the commission on May 18 for authority to renew the Sunday service. It was then that the commission issued its over-ruling order. Accordingly, an attempt was made by the company to restore bus service on the original schedule. The driver of the first bus to stop within the city limits was arrested, however. Pending a promised action against the company by city officials, Sunday service in Zion has again been suspended.

As a consistent reader of your publication and representing the city of Zion in this matter, I cannot allow to pass unchallenged this erroneous and unfair statement. The statutes of the state of Illinois concede certain rights and duties to cities and villages in the matter of streets. It is the position of this city that no buses may operate within a municipality without prior consent of the municipality. The Illinois Commerce Commission recognized this fact in the North Shore certificate case No. 12498 when it said: "Of a certainty, any order of this commission must be construed in relation to the local power and authority of any municipality involved."

The commission gave the North Shore company a limited certificate in 1922 to operate "through" the city of Zion—it did not and could not, in the absence of permission first had and obtained from the city of Zion, authorize the bus company to operate "in" the city of Zion. Later the city of Zion by franchise and resolution granted the bus company restricted permission to operate in the city. Still later, i.e., some months ago, the Council directed by appropriate resolution that the buses should not stop in the city on Sundays. This was due to the religious nature of the city and the general desire of the citizenry to keep that day in accordance with our faith. The North Shore readily consented to this restriction—there was only a very limited Sunday patronage.

About six weeks later, due to political influences in our county, the bus company was cited to appear before the commission and "show cause why it does not observe its schedules." The North Shore did not appeal to the commission for authority to renew the Sunday service—your statement to that effect is in error. The relations between the city of Zion and the North Shore company are most cordial. No 400 citizens have been inconvenienced nor protested. There were, it is true, a few names signed to a petition, but practically none of them ever used the bus and many signatures represented young children.

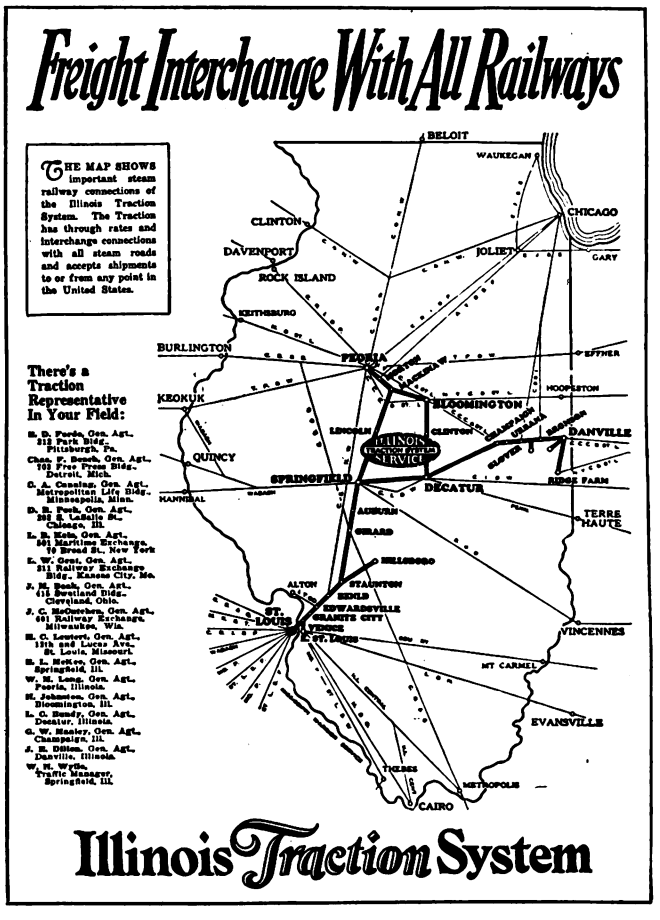
There has been no attempt made by the city to interfere with state regulation as authorized by law; we do contend, however, it is the city's right under our statutes to say when and where the buses may and shall stop on public streets. There is much legal support for this view; I may add this issue is now pending before our Supreme Court in an action brought by the city of Chicago against the Chicago Motor Bus Company.

I should appreciate the courtesy if you will print this letter, to offset the incorrect and unfair statement which appeared in your June 12 issue.

A. E. HUENERYAGER,
Commerce Counsel.

A Good Selling Job on a Single Page Circular

SELLING a freight service on the theory of "express service at freight rates" is appreciated by many interurban lines in the Middle West. The Illinois Traction System has recently issued a one-page circular as illustrated. In this the prospective shipper is shown



One-Page Advertisement of Freight Service Offered by Illinois Traction System

at a glance the possibilities of routing merchandise to and from the many steam roads intersected by this 556-mile system of interurban lines. Names and addresses of the traction representatives at all important points are included.

Interurbans in the central West are well situated to provide a real service in the rapid distribution of commodities.

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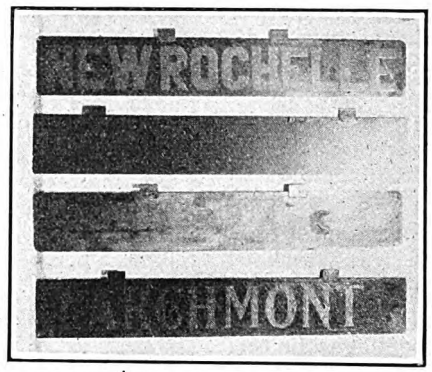
Maintenance Notes

Spray-Painted Signs Produce Economies

WHEN the New York, Westchester & Boston Railway opened its extension from Larchmont to Mamaroneck, New York, a large number of destination signs were required. It was desired to produce these quickly, and as economically as possible, and also to perfect methods so that they could be maintained cheaply. Several methods were tried and a spray-painting method using lead stencils was finally found to give best results by J. T. Hamilton, master mechanic of the railway.

Preliminary tests of different methods showed that the spray method using lacquer paint was most economical. Difficulty was experienced, however, in regard to the stencils. Several different materials for these were tried, including brass, steel and paper. Trouble was experienced in keeping the stencils tightly against the sign to be lettered. If any of the edges of the stencil at the letters were raised slightly from the sign a wavy and blurred edge was produced which required considerable time of the painter to touch up.

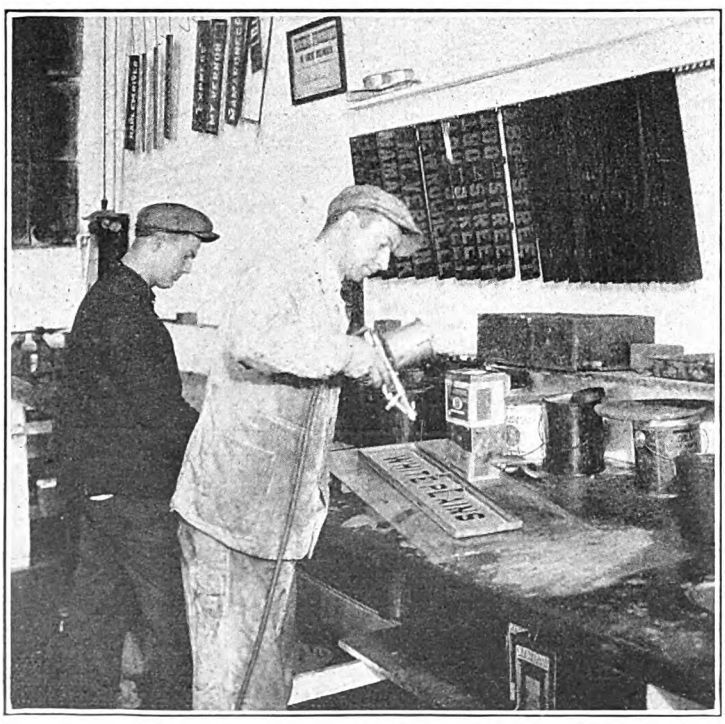
Lead Stencils with Loose Parts Held in Place by Wires Raised from the Surface



In Relettering Decalcomania Signs the Old Paint Is Removed and a Black Body Color Is Sprayed Over the Old Lettering. An Old Sign Is Shown at the Bottom, Next Above Is the Sign with Paint Removed, Next Is Sign with Body Coat Applied, and Finished Sign Is at Top

Also as several of the letters required supports for the center opening and loose parts, a form of stencil with flat supporting sections made it necessary to hand paint out several lines in the finished sign. These problems were finally solved by using a lead stencil, $\frac{1}{8}$ in. thick, and by supporting the loose sections by brass wires, which were raised up from the surface of the lead so that the spraying would not be interfered with. To bring the edges of the stencil at the letters into good contact with the sign the lead is pressed down by the workman as the letters are sprayed. Accompanying illustrations show the construction of the stencils and also examples of signs done by this process.

The signs are lettered on $\frac{1}{16}$-in. spring steel plates. In order to provide distinguishing marks when the signs are placed in a rack, and also for convenience in locating the stencil accurately, lugs are arc welded to the sheet steel. These extend out from the main body of the sign. The material used for painting consists of a ground color in Japan. The surface of the sign is first sprayed with a black color, then the letters are sprayed on, using chrome yellow,



Spray Painting a Sign in the Shops of the Railway

Attractive Appearance Results with the Signs in Position

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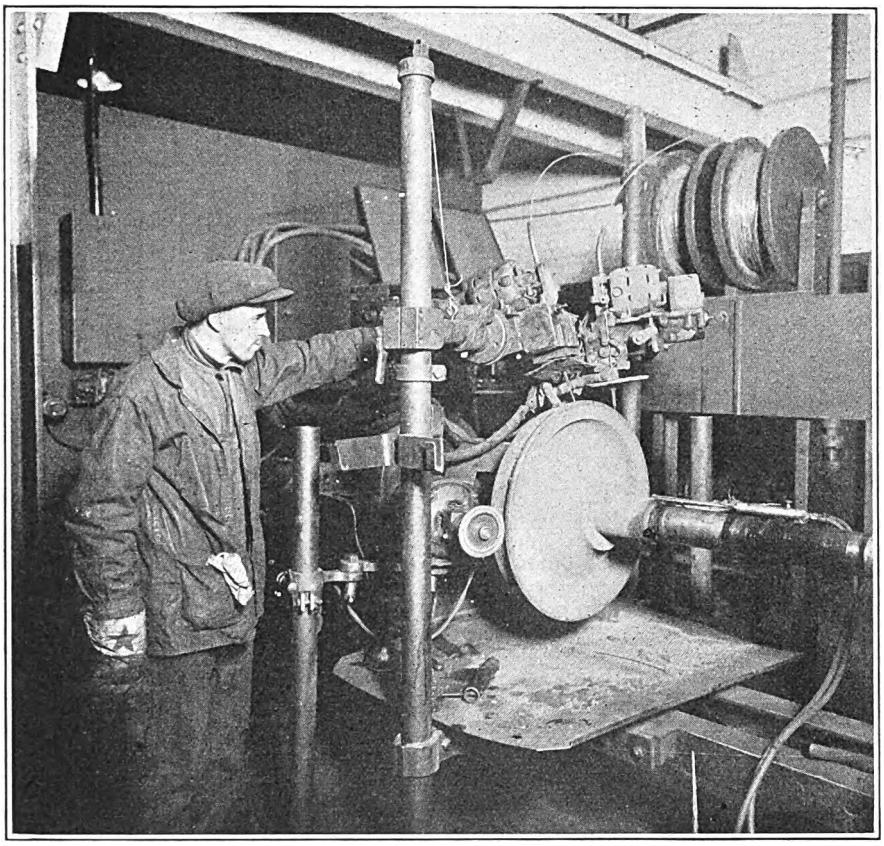


A Motor-Driven Wire Brush Mounted so as to Provide for Convenient Adjustment Cleans the Flanges of Wheels Preparatory to Welding

and uncolored lacquer is applied over all as a final coat. A Paasche type of air gun is used for all of the spraying operations.

In experimenting regarding best methods of cleaning up the edges where these become blurred, it was found that gasoline rubbed lightly along the edge will remove the last layer of paint applied without damaging the surface of the undercoat. This saves time also as the painter does not need to retouch the edges of the letters with a brush and paint.

In the maintenance of signs lettered with the lacquer paint process no attempt is made to remove the material, but the sign is cleaned thoroughly with steel wool and then a body of black is sprayed over the letters and the same method of lettering is then used as for new signs. In relettering decalcomania signs which were previously used all of the old paint is removed.

Wire Brush Cleans Ahead of Weld

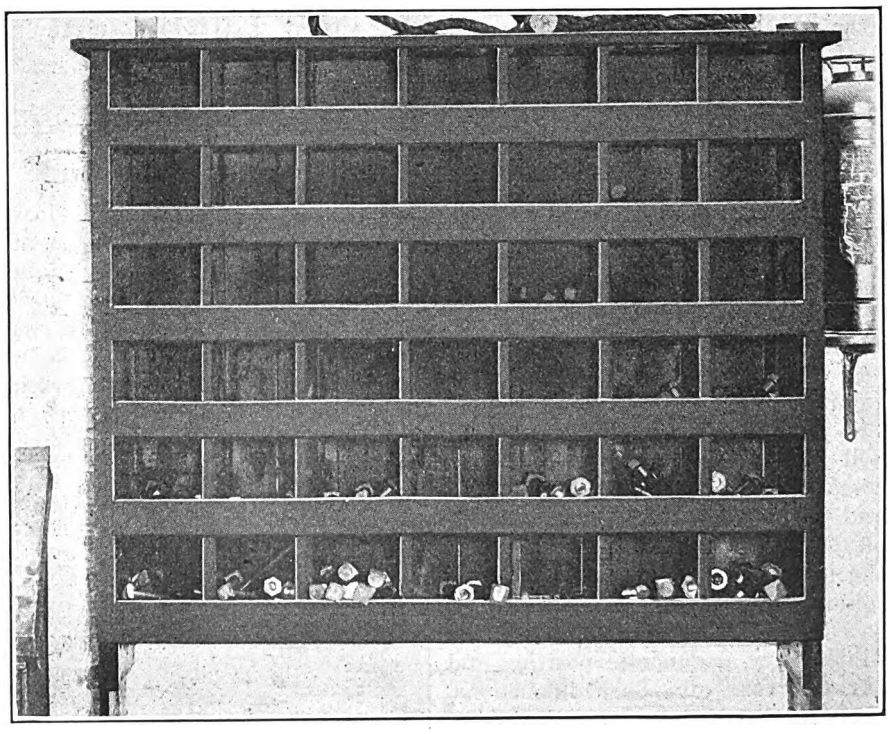
FLANGES of rolled steel wheels used by the Department of Street Railways, Detroit, Mich., are built up by automatic electric welding. To provide a clean surface for the layer of metal which is deposited, a motor-driven circular wire brush has recently been added to the welding equipment. The methods employed for building up the flanges of wheels by means of a double-head welder were discussed in ELECTRIC RAILWAY JOURNAL, issues for Jan. 17, 1925, and March 21, 1925.

The circular wire brush used for cleaning ahead of the point where the welding takes place is mounted on an extension of the shaft of a ¼-hp. motor. The motor in turn is mounted on a bracket with a hinged adjustment. The supporting bracket is clamped to an upright pipe of 2 in. diameter. Vertical adjustment of the brush is obtained by moving the clamp up or down on the supporting pipe. Sidewise and in-and-out adjustment is made by the swiveling action of the supporting bracket, which in addition to having a hinge connection in the center also turns about the upright pipe support.

Cleaning of the flange ahead of the welding has proved of particular advantage for this work, as much more satisfactory welding is obtained without danger of the welded metal scaling off. Some steel wheels, instead of wearing to a sharp flange which requires building up, wear to a thick flange with a square back. In order to bring these flanges back to a standard contour, an oxyacetylene burner is mounted on the bracket for the wire brush motor. The backs of the flanges are then cut to the desired shape by this outfit.

Bolt Rack in Overhauling Section

SUPPLIES of bolts and nuts most used in truck overhauling by the Grand Rapids Railway, Grand Rapids, Mich., are carried in a rack



A Rack for Keeping Bolts Handy to Truck Overhauling Work Has Been Found Useful in the Shops of the Grand Rapids Railway

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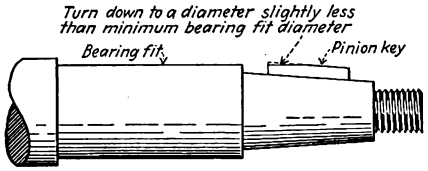
provided in its truck overhauling section of the shop. This rack has 42 small compartments each labeled with the particular size of bolts which is kept therein. Truck overhauling workmen can thus be sure of getting a bolt of the proper size and can obtain this quickly without the necessity of going to the storeroom each time one is required. An accompanying illustration shows the rack in place in the shop.

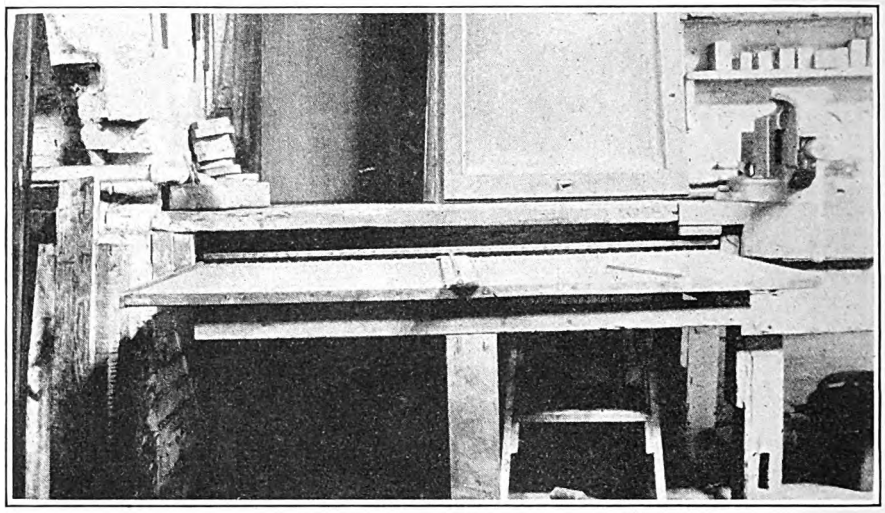
Pinion Keys Made Permanent with Shafts

TO RENEW pinion end armature bearings it is necessary to remove the pinion, and in many cases the keys for the pinion also must be removed in order to get the armature bearing off. A few removals of the key from its keyway will destroy proper fit, and a loose keyway results in breakage of the pinion and destruction of the armature itself, which often costs several hundred dollars to repair with new materials and keeps equipment from service.



Pinion Keys for Armatures of the West Penn Railway Are Rusted to the Shaft and the Top Edge Is Turned Down to a Diameter that Will Permit the Pinion End Armature Bearing to Pass Over

This problem has been effectively solved by Daniel Durie, superintendent of equipment for the West Penn Railways, Connellsville, Pa. Pinion keys on the armatures of this company's railway motors are made permanent with the armature shaft by rusting them into position. When a key is installed it is dipped in salammoniac water, and by allowing the shaft to stand for a few days rusting takes place so that the key is anchored solidly in position. In order to provide clearance, so that the pinion end armature bearings will pass over the top of the key, armature shafts are placed in a lathe and the tops of the keys are turned off to a diameter slightly less than the minimum diameter to which the pinion end bearing fits are allowed to reach as a minimum. After the pinion keys are once in position and turned down to proper dimensions, they need not be removed and so there is no danger of loose keys.



Ruled Board and Straight Edge Used by Beaver Valley Traction Company in Cutting Window Glass

Board Aids Glass Cutting

EASE in the cutting of glass has been obtained by the Beaver Valley Traction Company, New Brighton, Pa., with a cutting board specially designed for this work. It is ruled laterally and longitudinally at intervals of 1 in. and a straight edge, operating in guides at either side of the board, is used to mark the panes of glass for cutting. A particular feature of this straight edge is the ratchet arrangement provided at top and bottom so that fractional adjustments from side to side may be made, thus giving any desired measurement.

New Equipment Available

All-Copper Rail Bond

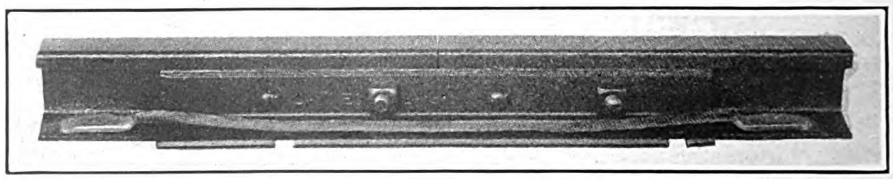
HEAVY copper terminal sleeves to hold securely the cable in a tight strip are features of a new rail bond being placed on the market by the Electric Railway Improvement Company, Cleveland, Ohio. This is an all-copper bond, and no molds, dams, or other special devices are required to install it on the rail when using the manufacturers' special coated pure copper arc-welding rod. The sheath and cable are forged to a thin flat section, which is sheared at an acute angle. The surface exposed to welding is therefore of greater area than the cross-section of the cable. Due to the thin flat welding face, a smaller amount of applied welding metal will give a rail contact of maximum area.

Improved Riveter

IMPORTANT improvements have been incorporated recently in the construction of Thor pneumatic riveters, made by the Independent Pneumatic Tool Company, Chicago, Ill. The handle is not subject to bending cracks, being drop forged with a heavy section at the bend. All portholes are drilled full and clear and spiral inlet ports to the throttle valve allow easy regulation.

A positive ratchet lock is provided between the barrel and handle, the octagonal milling on the sliding collar giving a large bearing surface to hold the collar rigid. The odd number of ratchet teeth combined with the even number of sides in the octagon give eight positions for perfect mesh on each ratchet tooth.

The main valve is a hollow sleeve of heavy section with no portholes. The lower end of the valve bore is ground tapered and larger than the bore in the barrels, preventing the piston from striking the valve.



New Type Rail Bond Applied to Rail by Means of Copper Welding Rod

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American Association News

Traffic Congestion

ATTENDING a meeting of the committee on traffic congestion held at Toledo, Ohio, June 4, were Messrs. Miller and Schorn, of Detroit, originators of the Miller-Schorn rapid transit plan, who outlined the plan as proposed for that city. Mr. Miller stated that he expected to see it in operation within twelve months. Considerable discussion followed his talk, but the committee took no definite action. R. W. Emerson presented an analysis of the report of the Hoover conference on highway safety, and explained how the sub-committee studying this subject had reached its conclusions.

Additional items to bring the model traffic ordinance up to date were suggested by A. J. Fink, as follows:

1. Vehicles coming out of alleys, garages, or any private property or driveway shall come to a full stop, sounding horn immediately before crossing sidewalk into the street.

2. In the congested district in any traffic restricted area, or on any main artery, no gasoline, oil, tire service or air shall be served on the roadway, but only from within the private property.

3. Parking shall be prohibited within 25 ft. of any exit for fire apparatus or other emergency equipment, also along the corresponding portion of curb on the opposite side of the street.

4. Parking shall be prohibited at street crossings within 20 ft. of the intersection of the curb lines, or within a distance so as not to interfere with the turning of street cars.

5. Parking shall be prohibited at any taxicab stand, hack stand, freight trucking stand or bus stop, except for the vehicles for which these stands have been set aside.

6. Parking shall be prohibited on main street car arteries on which heavy automobile traffic passes through.

7. Parking shall be prohibited along main car line throats in the congested district from 7 o'clock a.m., and on others from 8 a.m. to 9:30 o'clock a.m., and from 4 o'clock p.m. to 6:30 o'clock p.m.

8. Parking shall be prohibited within 50 ft. of a grammar or high school or playground property, or in the corresponding section of the curb on the opposite side of any such street, between the hours of 8 o'clock a.m. to 8 o'clock p.m.

9. No loading or unloading rubbish, ashes, garbage, coal, building materials, barrels or kegs within the congested area between 8 o'clock a.m. and 9:30 o'clock a.m. or between 4 o'clock p.m. and 6 o'clock p.m.

10. In the congested district in any traffic restricted area, or on any main artery between the hours of 8 o'clock a.m. to 6 o'clock p.m., no vehicle shall load or unload except parallel to the curb, at a place where written request has been made to the city official and a temporary written permit has been issued. Where and when end or angle loading is permitted, the vehicle shall remain backed to the curb only long enough to be expeditiously loaded or unloaded, and every precaution shall be taken to restrict traffic as little as possible.

11. On any street where parking is permitted during the hours when the parking limit applies, there shall be set aside upon approval of written request to the city officials a space designated as a loading zone in which passenger vehicles may stand for not over ten minutes, and in which vehicles shall stand only long enough expeditiously to load or unload merchandise.

12. No large girders, steam shovel or large tractor shall be moved during the daytime if it affects the movement of traffic; in such event it shall be done at night. In all cases a written permit of the city officials governing the route it shall take to get to its destination shall be required.

13. No manhole shall be opened up on busy thoroughfares without a permit, and in some cases manholes shall be permitted to be opened only during off-peak hours.

14. Vehicles shall make no lefthand turns in the delivery district during peak hours, wherever possible.

15. Traffic officers shall divert vehicular traffic when necessary in order to avoid congestion or to promote safety and convenience, and no person having charge of a vehicle shall refuse or neglect to obey the direction of a traffic officer.

16. Any police or traffic officer shall cause to be impounded any vehicle left without an operator that interferes with the general regulation of traffic, and the owner or operator thereof can only repossess himself of such vehicle by first paying any and all towing and storage charges resulting from such violation.

After discussion, it was recommended that these new items be included in the committee report.

Synchronized and co-ordinated traffic signals were considered. It was the consensus of opinion that co-ordinated lights of the general type used in Chicago were desirable, and it is planned to include such a recommendation in the report.

Investigation being made to determine the means of transportation used by customers patronizing department stores in congested districts has not been fruitful of results. J. A. Greig stated that Cleveland and Chicago were the only cities where checks of this kind have been attempted. In Cleveland, Mr. Emerson said that a three-day check has been made. C. H. Evenson brought out the fact that in Chicago $50,000 has been appropriated for traffic surveys. Information obtained from these investigations is to be included in the final report of the committee.

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 28-July 2 — **Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.**

July 8-10 — **Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.**

July 22 — **New England Street Railway Club, annual outing, Portland, Me.**

July 23-24 — **Central Electric Railway Accountants' Association, meeting, Drake Hotel, Chicago, Ill.**

August 12-13 — **Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.**

Oct. 4-8 — **American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.**

October 25-29 — **Annual Congress and Exhibit—National Safety Council—Detroit, Michigan.**

Accident Prevention

MEMBERS of the joint committee on accident prevention of the Claims and Transportation & Traffic Association will recommend at the convention in October: (1) safety education of the public and school children; (2) co-operation with all local accident bodies; (3) indorsement of the so-called Hoover plan. They will further recommend that the work of the committee be made continuous. This was decided in New York on June 4. At that meeting the members present went over the answers to a questionnaire on accident prevention work which was sent out some time ago. Answers received to this questionnaire represented 60 per cent of the companies doing outstanding work. In the report of the committee the high lights of the answers will be picked out, and the names of the companies which replied to the questionnaire will be presented. The answers in detail will not be given. The idea is to recommend or call attention to methods employed by other companies. It was agreed that one of the best means toward progress in accident prevention was by lining up the association behind the Hoover plan. This contemplates efforts to secure general acceptance of the model Hoover law so modified as to meet any purely local needs. This would be a great step toward uniformity. Members were urged to turn in their advanced report comments by July 1. Among those who attended the meeting were A. W. Koehler, Milwaukee; R. R. Hadsell, Rochester; E. J. Paige, Baltimore; G. B. Powell, Louisville; A. G. Jack, Wilmington; Seth Baldwin, New Haven; T. E. Lawrence, Brooklyn; M. W. Bridges, Chicago, chairman for the T. & T. Association, and H. K. Bennett, Providence, chairman for the Claims Association.

Merchandising Transportation

FINAL consideration of the report of the merchandising transportation committee of the Transportation & Traffic Association was given at the last meeting of the year held in Cleveland on June 22. Drafts of practically all sections of the report had previously been read and passed on.

Only the final revisions and discussions of the last sections of the report remained.

Members present were: R. W. Emerson, H. L. Brown, E. A. Palmer, A. C. Spurr, S. E. Emmons, J. D. Donley, C. D. Smith and R. N. Graham, chairman.

New England Outing Planned

PORTLAND, Me., will be the meeting place of the New England Street Railway Club's annual outing, which will be held on July 22.

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The News of the Industry

Commission Won't Oppose Local Council

The Public Service Commission in the matter of the application of the United Traction Company, Albany, N. Y., for an increase in its fares from 7 to 10 cents decided that it had not jurisdiction to enforce increased fare in the cities of Troy and Rensselaer in opposition to the terms of local franchises. The action of the commission is viewed by officials in the cities affected as opening the way back to the original 5-cent fares in Troy and Rensselaer. The commission's action also serves to advance the demands of Albany city officials that in requesting a fare increase the traction company should not seek to make Albany pay deficits incurred in other cities of the Capitol district.

John E. MacLean, counsel for the United Traction Company, said that the decision would be appealed. This probably means that the entire matter of increased fares for the United Traction Company will be taken out of the hands of the Public Service Commission and determined in the courts.

Use of Chicago's Idle Traction Funds Sought

Two resolutions seeking to compel the Chicago Surface Lines to invest its damage claims reserve fund in good bonds and to use its depreciation and renewal fund for the construction of at least 60 miles of new track and the purchase of 350 additional cars, were presented to the local transportation committee of the City Council on June 17 by Alderman C. F. Nelson.

The author of the resolutions declared that the company's damage claims fund, which now amounts to nearly $6,000,000, is in the banks and drawing only 3 per cent interest. He proposes to have the fund placed in the custody of a board of trustees, composed of representatives of both the city and the company, who will invest as much of the sum as is not required for the settlement of damage claims in bonds yielding a higher rate of interest.

More than $16,000,000, which has accumulated in the company's renewal fund since the unification ordinance of 1911, should be expended for better transportation facilities before the franchise expires next February, the Alderman urged. Although track construction and additional equipment do not legally constitute renewals and replacements, he believes that a precedent for such a proposal was set when the 100 new cars recently ordered by the company were paid for out of this fund. Invested in these much needed facilities, he added, the fund will earn 8.25 per cent instead of only 3 per cent.

Pursuant to Alderman Nelson's suggestion, Corporation Counsel Busch was instructed to confer with surface lines immediately and to draw up a petition to the Illinois Commerce Commission asking authority for such expenditures.

The failure of surface lines officials to appear before the committee was explained by the Alderman as being due to their interest in receivership. They want to control the first mortgage bonds and, therefore, the companies, by a receivership for three or perhaps five years, he said. Their attitude of indifference, however, is not regarded by the committee as a bar to further progress. The latter has threatened to complete the franchise draft without the companies' co-operation if it is found to be necessary. Mr. Leonard Busby, president of the Chicago City Railway, is the only traction executive who has so far agreed to discuss the problem with the committee.

Intensive Advertising Drive

Milwaukee Company, Through Newspaper Medium and Employees' Talks, Informs Public of Purpose of One-Man Car Service—Uniformity of Appearance Meets with Public Approval

IN CONNECTION with the recent installation and operation of one-man cars on its Walnut Street line, the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has launched an intensive advertising campaign in all Milwaukee newspapers to acquaint the public step by step with what the company is trying to accomplish as well as what the new service will mean to patrons of this line in the way of speedier, more reliable service.

Three of the series have already appeared. Each occupied a quarter page of space. These good-will ads are placed before the public in the form of letters signed by S. B. Way, president of the company. The ads follow:

May 21, 1926.

TO OUR PASSENGERS:

This company is authorized to operate one-man cars on the Walnut Street line, and will begin on Sunday, May 23.

That line will so operate as to provide you with safer, better and more frequent service.

This company does not profit by the change in method of operation. It hopes, ultimately, to gain some benefit, because this more ample and more convenient service should attract more car riders.

The cars to be placed in service on this line are newly painted and furnished. They are equipped for electric heat, and have the latest and best safety appliances.

They will run on schedules as fast as the two-man cars. There will be more cars in operation.

Our trainmen are careful and skillful. You will find them considerate in their service.

Use this new line and judge of the comfort and convenience of the service for yourselves.

S. B. WAY,
President.

(This is Number One of a series of letters to be published here.)

May 24, 1926.

TO OUR PASSENGERS:

The cars in the new Walnut Street service were on the line yesterday.

These cars have new equipment for your safety, comfort and convenience. These new features are fully described and illustrated in a leaflet to be distributed today to passengers on all of our city lines.

But these cars require no new or extra effort on your part when you ride in them. Use them as you do all other street cars.

You can tell one of these cars as far as you can see it. You will notice that it is newly painted in distinctive colors. Also it is newly furnished inside, and is equipped for electric heat.

It is a front-entrance car. The front entrance sign is in plain sight and brightly lighted.

It is a safety car. It has all the best safety equipment yet devised. It is the type of car certified by official authority in all the states, as safe, convenient and practical. We have confidence in this safety car.

It is you that the company desires to please because we want your business, and more of it.

You may judge this car for yourselves. We shall appreciate your comments.

S. B. WAY,
President.

(This is Number Two of a series of letters to be published here.)

May 26, 1926.

TO OUR PASSENGERS:

The new Walnut Street service was put in operation last Sunday.

There are now in use on that line, during the busiest rush periods, 21 one-man cars with 1,134 seats; instead of sixteen two-man cars with 832 seats—31 per cent more cars and 36 per cent more seats. In addition, during the heaviest rush hours, seventeen two-car trains are operated.

During other periods of the day, except for "owl schedules," there are proportionate increases of service.

The running time of the one-man cars between terminals is just as fast as before the change was made.

You get the benefit of more service, with no loss of speed, and the advantage of newly furnished cars equipped for electric heat and for greater safety.

The trainmen on these cars earn 5 cents more per hour. They have been carefully trained for this service. You will find them skillful and courteous.

There is no mystery and no secret about this "one-man car" business. It is the sensible, safe and widely used method to improve street car service by increasing its frequency. It is the *only* way to do so at practically the same cost.

Use these cars and judge this service for yourselves. Your comments will be welcome.

S. B. WAY
President.

(This is Number Three of a series of letters to be published here.)

No stone apparently is being left unturned by the company in its effort to acquaint—this time in an entirely new and novel way—patrons of its Walnut Street one-man car line in the fundamentals of the one-man car so that a better understanding of their operation and use may be gained. The company adopted the plan of having street car employees trained in public speaking present a short talk to passengers from the front of the car, after loaded cars were boarded, telling them in well-chosen words how to leave the car through the back door rear

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treadle and explaining the mechanism of its operation with a view to its full use by patrons, particularly when cars are crowded. Five conductors have been transferred from their regular work for this special duty, which will continue until the company believes it has reached nearly all patrons under this new educational plan.

Uniformity of appearance will mark the use of one-man cars hereafter in Milwaukee. According to plans set in motion by R. H. Pinkley, assistant general manager of the company, all cars of the one-man type now in operation on the 27th, 35th, Center and Clybourn Streets lines are to be repainted an orange and cream color and equipped with imitation suede seats so that they will be easily distinguished from the two-man cars. The orange and cream colored one-man cars on the Walnut Street line have met with such favor that the company decided to standardize this color for its one-man cars.

Survey Suggested

In connection with the subject of transportation and transit matters in general the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has placed before the Common Council a request covering a comprehensive survey of Milwaukee's transportation needs, the cost of which will be met by the company providing it does not exceed $50,000. According to the outline of the survey contained in President S. B. Way's letter to the Council, this transportation check would be conducted by qualified engineers under the direction of a joint committee representing city officials, citizens, Railroad Commission and the company. The survey is to obtain an impartial insight into street transportation needs so as to make possible better co-ordination of transportation facilities, consideration of transportation needs in city planning and general improvement in transportation service.

Mr. Way explained that his survey plan is prompted by a similar check recently completed in Washington, D. C. He suggested that McClellan & Junkerfeld, the engineers who had charge of the survey there, be retained for the work in Milwaukee.

One-Man Car Case at Des Moines Argued

Oral arguments in the appeal of the Des Moines City Railway, Des Moines, Ia., from the decision of Judge Joseph Meyer in the Polk County District Court in favor of the local street car men's union have been presented to the Iowa Supreme Court. Ralph L. Read of Sargent, Gamble & Read represented the company, and C. C. Putnam the union.

Several months ago Judge Meyer held that a contract between the company and the union requiring that every car shall be in charge of a motorman and a conductor was valid and binding. The company maintained that an agreement of this kind is against public policy in that it prevents the company from instituting economies which would result in the reduction of fares. The contract was signed in 1915, and has nearly fifteen years more to run.

The railway has four one-man cars in operation in Des Moines. Pending the outcome of the appeal, two men are kept on each car, although the "conductor" has no duties. The company contends that if it were permitted to change to one-man cars a saving of nearly $200,000 annually could be effected in trainmen's wages alone.

No decision from the Iowa high court is expected before fall.

Test Period Likely at Tacoma

Plans for the settlement of the Tacoma transportation problem, undertaken by the new Mayor, Melvin G. Tennant, and the City Council, may not be submitted this fall to the people. This was indicated at the second conference between city officials and representatives of the Tacoma Railway & Power Company. It is proposed now that any plan worked out by the conference for possible adoption shall first be put into effect for a test period. R. T. Sullivan, general manager of the company, pointed out that the summer months are the poorest of the year for street car earnings, hence a reliable test might not be obtained during three summer months. In consequence there may be a six months test. In that event the plan would be submitted at the spring election.

Mayor Tennant asked the company officials for figures on the way in which a 7-cent fare would affect the earnings, following submission of figures on what the earnings would probably have been during the past year if the conditions of operation of 1920-21, with 10-cent cash and 8-cent token fare, universal transfers and no jitney competition, had been in force. Other figures on depreciation charges for ten years past were asked by E. K. Murray, city attorney, who is studying company reports. Manager Sullivan did not have a figure of valuation upon company property upon which he would expect a 6 per cent return in any proposed settlement, as was requested at the first meeting. He explained that inasmuch as the value of the property has been fixed by the State Department of Public Works, it will be simpler to retain this valuation and alter the return figure to whatever is deemed proper. Mayor Tennant suggested a figure lower than 6 per cent as proper upon the state valuation of about $7,000,000.

Many factors of street car operation were discussed, including the possibility of inducing the public to use the street cars for transportation, particularly to and from work, instead of operating automobiles and parking them all day.

The Mayor said:

> I think that before we are finished we will arrive at the point where we will hold that the man who drives his own automobile should pay a part of the cost of maintenance of railway service. Property is valued more if we have street car service than if we have none, or if we have good service rather than poor service. I think that at some point, somewhere, the auto driver should help pay for the service for the man who rides the street cars.

Mayor Tennant again went on record as against the city purchasing the railway system.

Two-Cent Increase for Detroit Municipal Men

An advance in wages of 2 cents an hour for platform men of the Detroit Department of Street Railways, without any increase in fares, has been tentatively agreed upon by the D.S.R. management. Announcement to this effect was made on June 21. It is expected that the new wage agreement will be approved by the Street Railway Commission. The increase was accepted by the men at a meeting held under the auspices of Division No. 26 of the Amalgamated Association.

It is estimated the increase will cost the city approximately $210,000 a year. The 7-cent increase asked by the men would have cost the department more than $1,955,000 a year.

If the agreement is ratified by the commission, the increase will be made in two steps, one of 1 cent an hour on July 1 and another like increase to become effective on Aug. 1.

A number of meetings were held, at which the committee representing the men and the D.S.R. officials discussed the changes in wages and in working rules asked by the men. The men included in their request the provision that all scheduled weekday runs of more than six hours and under eight hours shall be considered as regular runs and shall be allowed eight hours time. Of scheduled weekday runs 50 per cent must be completed within eleven consecutive hours. Forty per cent of all runs must be straight runs, as nearly equally divided as possible between day and night runs.

Thirty-five per cent of the total number of runs are to be completed within thirteen consecutive hours. Not to exceed 15 per cent of all runs may be extended to exceed thirteen consecutive hours to complete. Runs requiring more than thirteen hours to fourteen hours to complete will be allowed an additional ten minutes bonus.

It was further provided that runs requiring from fourteen hours to fourteen and one-half hours to complete will be allowed an additional twenty minutes bonus. Runs requiring from fourteen and one half to fifteen hours to complete will be allowed thirty minutes bonus, with one hour additional bonus for each additional hour thereafter.

Rates that apply to motormen, conductors and motor coach operators follow:

Two-Man Cars	Cents an Hour
First six months.....	67
Second six months.....	71
Thereafter	75

Rates that apply to one-man car motormen, also to operators of motor coaches or buses seating 35 passengers or more follow:

One-Man Cars	Cents anHour
First six months.....	72
Second six months.....	76
Thereafter	80

Owl car men, except one-man car motormen, will be paid 85 cents an hour. The one-man car operators will get 90 cents.

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New York Warned Against Scrapping Trolleys

Eloquent Plea Made for Them by Railway Official Who Gave Facts and Figures

Decision was reserved on June 22 by the Board of Estimate of New York on former Comptroller Charles L. Craig's proposal to sell the Fourth and Madison Avenue, Eighth Avenue and Ninth Avenue surface lines to the city. At the hearing formal notice was received from the holders of receiver's certificates of the Second Avenue Railroad that that property was for sale.

In addition, Borough President Joseph A. Guider of Brooklyn offered a resolution for an inquiry to determine whether the Fulton Street elevated railroad in Brooklyn from Ashland Place to the East River should not be torn down, and Edward P. Doyle of the New York Real Estate Board, on behalf of the recently formed Third Avenue Association asserted informally that the city should buy and tear down the Third Avenue elevated line, which he said he believed could be purchased for about $28,000,000. No action was taken on Mr. Guider's resolution, which will be considered at a future meeting of the board.

The hearing on Mr. Craig's proposal was merely on the question whether the surface lines he offered for sale for $7,000,000 constituted obstructions to traffic and misuse of the streets. Representatives of a dozen civic organizations favored the Craig proposal. Mr. Craig confined himself to a short explanation of the technical situation, which requires the consent of the Transit Commission to the abandonment of the operation of the three lines, even if the city should purchase them.

The principal speaker against the Craig proposal was Gerhard M. Dahl, chairman of the board of directors of the Brooklyn-Manhattan Transit Corporation. His argument was more in the nature of a general plea for the retention of the surface lines, which carried more than 1,000,000,000 passengers last year, than a direct argument against the city buying the Craig lines. Mr. Dahl declared that it had been shown by the experience of many cities that the motor bus could not handle "mass" transportation. He added that it would require five buses to carry as many passengers as three surface cars, and asserted that if buses were substituted for cars the congestion would be increased.

Incidentally, Mr. Dahl declared that buses, on anything but short routes, could not be operated for a 5-cent fare, and said that no responsible applicant for the bus franchise had offered a 5-cent fare.

Mr. Craig said he believed that it had been shown that the surface lines in question did constitute obstructions to traffic, and that the purchase of the lines would enable the city to clear two arteries for traffic, one from the Post Office to the Harlem River by way of Madison and Fourth Avenues and the other from Vesey Street to the Harlem River by way of Eighth Avenue. The only north and south street in Manhattan now clear, he said, was Fifth Avenue, and this was blocked by Washington Square on the south and Mount Morris Park on the north.

John D. Fearhake, counsel for the holders of receiver's certificates of the Second Avenue Railroad, informed the board that the property of that company could be purchased by the city and that the certificate holders, the owners of the property, would be pleased to open negotiations. Upon suggestion of Mayor Walker, Mr. Fearhake said he would file a written offer.

It is hoped to present a summary of Mr. Dahl's remarks in an early issue of the ELECTRIC RAILWAY JOURNAL.

850 Car Stops to Be Eliminated at Detroit

The Common Council of the city of Detroit on May 28 unanimously approved a plan submitted jointly by the Mayor's committee on traffic and H. U. Wallace, the general manager of the Department of Street Railways, for the elimination of 850 car stops on the municipal railway system.

	Present Stops	Proposed Stops	Saving	Present Running Time, Minutes	Proposed Running Time, Minutes	Saving, Minutes
Jefferson.....	111	86	25	76	70	6
Grand River.....	173	136	37	130	118	12
Woodward.....	135	111	24	112	106	6

At the present time the Department of Street Railways is using the skip-stop plan outside of the business district, the stops on an average being approximately 600 ft. apart. Under the plan submitted to the Council the general scheme outside of the business district is to skip two blocks between stops, making an average distance of approximately 900 ft.

There are 3,400 stops on the Detroit system and the plans call for reducing this number to 2,550. The general manager in submitting the plan to the Council pointed out that reducing the number of stops would permit the department to cut the round-trip running time for the system by 212 minutes, and would also lessen the time of travel for passengers on street cars, speed up vehicular traffic in general and reduce to some extent the accident hazard. In laying out the proposed stops, the location of churches, schools and heavy loading and unloading points were all considered. It is estimated that the plan will result in a saving to the Department of Street Railways of approximately $600,000 a year.

An example of results which will be obtained through the elimination of some of the stops on three of the main lines of the system is shown in the accompanying table.

At the same meeting of the Common Council Mr. Wallace and Commissioner John W. Reid of the Department of Public Works presented a plan for the installation of approximately 100 protected safety zones to be constructed along several of the lines this year.

In addition to the elimination of stops and the construction of safety zones, it is planned to install traffic signals approximately 2,000 ft. apart in the outlying sections of the main lines for the purpose of breaking traffic sufficiently to permit passengers to enter and leave safety zones or for pedestrians to cross streets.

Paving Made an Issue in Ohio Cities

Disputes between municipalities and electric railways over the cost of paving between tracks are now attracting considerable attention in the section of Ohio near Springfield. On the heels of a battle between the Indiana, Columbus & Eastern Traction Company and the City Council of Bellefontaine over the paving of North Main Street in that city, a suit was filed in the Clark County Common Pleas Court by the city of Springfield against the Springfield & Xenia Traction Company seeking to obtain a judgment representing the cost of paving a street between the tracks of the company, and on top of this the city on May 25 served notice on the Springfield & Xenia Company that unless it agreed to pay the cost of paving between the tracks in another street the city would take steps to oust the tracks from the street.

The latest action in the Bellefontaine case was the issuance of a statement by Bellefontaine city officials charging that the traction company was delaying the paving work in North Main Street in an effort to "force through a franchise favorable to its own interests." The traction company recently, under instructions of Federal Judge Killits of Toledo, withdrew a car that was being used solely for local service in Bellefontaine and substituted instead stops by the regular interurban cars.

In the suit filed against the S. & X. by the city of Springfield the city had proceeded with the paving work and now seeks to collect for the traction company's share of the proceedings.

The threatened ouster action aimed at the company in the proposed paving of another street is being taken calmly by company officials, who declare that the company is not in a financial position to pay for the paving even if it is allowed to pay for it in ten annual installments as proposed by the city.

The railways are contending that street paving work is done solely as a benefit to motorists who are, in effect, competitors of the traction companies.

Drama in Grand Rapids Screened

A screen version of the railway pageant in Grand Rapids, Mich., was enacted at the office of Hodenpyl, Hardy & Company, New York, N. Y., on June 25 before several spectators, who were both edified and delighted—edified at such a demonstration of civic pride on the part of the residents of Grand Rapids and delighted with the proof of transportation progress in that city. How the young and old turned out on June 12 to welcome the 27 new electric rail coaches, ushered into service by the Grand Rapids Railway, is now a part of the history of the West, the details of which were given in the ELECTRIC RAILWAY JOURNAL, issue of June 19, page 1069.

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Banker Opposes Pending Traction Ordinance

In a communication to the local transportation committee of the Chicago City Council, Albert W. Harris, chairman of the Harris Trust & Savings Bank and of the protective committee representing the Chicago Railways' first mortgage bondholders, has declared that the kind of enabling legislation that is suggested in the proposed traction ordinance would neither be acceptable nor would it restore credit. It would vest the regulation and control of one of the contracting parties in the hands of the other and is unsound financially, he said.

Mr. Harris did not speak for the bondholders officially, but intimated that investors will not buy the new traction securities if the city of Chicago, through some agency created by itself, is to regulate local transportation under a terminable permit. He said:

> I do not consider this the time to discuss the details of a franchise. The ordinance as submitted, even if approved by the voters, would not be a contract or an operating agreement because the necessary legislation is lacking.
>
> In addition, whatever agreement might be reached at this time would not be binding upon either the city or the surface lines and, therefore, I would not regard this draft of an ordinance in the nature of a franchise but as a memorandum of what must be done before a franchise can be granted.

Mr. Harris insisted that legislation must first be obtained before a solution of the traction problem can be attempted. Henry A. Blair, president of the Chicago Surface Lines, expressed substantially the same opinion in an earlier letter to the framers of the present draft.

The banker approved, however, the suggestion of the City Council that the Surface Lines be consolidated into one company and expressed satisfaction with the plan for an operating agreement between the surface and elevated line.

Operation Resumed Over Cincinnati, Milford & Blanchester

The Cincinnati Street Railway, Cincinnati, Ohio, which recently purchased the Cincinnati, Milford & Blanchester Traction Company for approximately $50,000, has resumed operation over the route. Sale of the company's assets to the Cincinnati Street Railway was approved several weeks ago by Edgar Dow Gilman, Director of Street Railroads and Buses. The cars of the Cincinnati, Milford & Blanchester Traction Company are in the shops of the street railway for overhauling. Pending their repair large one-man cars are being operated over the line, between Madisonville and Milford, but later cars will be operated through between Government Square and Milford. In the meantime the Madisonville car line will be used between Madisonville and Government Square. Walter A. Draper, president of the Cincinnati Street Railway, said that some of the Cincinnati, Milford & Blanchester cars would run only between Madisonville and Mariemont, while others would go through to Milford. The newly bought line serves Mariemont particularly, one of the fastest growing suburbs in Hamilton County.

Week-End Safety Drive in Baltimore

With the coming of weather which takes the people out of doors at every opportunity, Baltimore has its quota of week-end accidents of all kinds. The newspapers on each Monday morning usually chronicle a long list of accidents that occurred the day before while the public was seeking recreation from the weekly grind. It is with the view of reducing these week-end accidents to the minimum that the United Railways & Electric Company has launched an unusual campaign. Although the company continues with its regular safety work, which is being carried on all the time, it has started the drive against week-end accidents as a supplementary campaign.

> ACCIDENTS OVER
> THE WEEK-END
> MAR HAPPINESS IN
> MANY HOMES
> MAKE OUR SERVICE
> SAFE
>
> PREVENT
> WEEK-END TRAGEDIES

The new work has been undertaken by the safety department of the company, and the Baltimore Safety Council also is expected to join the United in bringing about a reduction in the number of week-end tragedies. Although the company is bringing its work prominently before the attention of the public in general, it is spending much effort in impressing the idea upon the operating employees of the company. Car cards also are being used by the company to bring the objects of the campaign to the attention of the public.

To Operating Employees

All of us know the week-end toll from accidents. Monday's newspapers carry columns about these mishaps. In many cases lives are lost. Untold suffering and economic waste lie in the wake of accidents. A program of prevention is entitled to the earnest thought of every one in this community.

People want to be in the open at this season to enjoy the beauties of nature. Automobiles increase on the streets every day, and all who can seek the out of doors.

This means more situations requiring your timely and proper judgment to prevent accidents.

In the interest of public safety, we are co-operating in efforts throughout the city to

Prevent Week-End Accidents

We have the utmost confidence that every man in this company will lend his full assistance to this worth-while effort.

The responsibility is placed squarely upon you and we know you will be equal to it.

"Help Prevent Week-End Accidents," they read.

Large posters, measuring 24 by 32 in., have just been placed in each of the company's 23 carhouses. They are signed by the safety department. Three-inch letters in green ink are used. The poster is reproduced herewith.

Further to impress the campaign upon the minds of the operating employees more than 4,000 cards have been distributed to motormen, conductors and bus drivers. The text of this card accompanies this account. Its wording shows how great a responsibility the company places upon every employee in its drive for safety.

Raymond S. Tompkins, assistant to the president of the United, said that he feels confident that the drive to cut down the number of tragedies that occur over every week-end during the nice weather will have good results. He emphasized, however, that the regular safety work conducted by the company, which is being carried on at all times, is not being slackened.

New York State Railways Entertains School Children

School children of Rochester, N. Y., have no better friend in all the city than the New York State Railways. For, thanks to the trolley company, more than 40,000 kids will frolic this summer at Sea Breeze Park, the big amusement resort owned by the railway. Transportation to and from the park, tickets of admission and for all amusement devices are provided free by the company. The railway will play host at a series of five outings, entertaining about 8,000 at a time. The picnics are in the nature of a reward for the co-operation of the school children in making the streets of Rochester safer. The movement is part of the safety program being carried on by Leon R. Brown, safety director of the company. The railways opened Sea Breeze Park, with its new $1,000,000 natatorium and salt water pool, on Memorial Day with a record crowd attending. The resort is in charge of Bertram E. Wilson, general passenger agent of the railway.

St. Louis Books Under Investigation

The Missouri Public Service Commission at Jefferson City, Mo., has decided to audit the books of the United Railways, St. Louis, for 1925 and part of 1926 before finally passing on the application of Receiver Rolla Wells for increase in fares from 7 to 8 cents. The company proposes to sell two tokens for 15 cents and not to disturb the present fare for children, 3 cents. The decision of the commission to go over the books, effective within ten days, means that it will be at least three months before it can get to the question of whether the company is entitled to more fare. Experts estimate that it will require at least three months to make the audit, and it is very uncertain how soon the accountants on the commission's staff can visit the car company's headquarters.

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Hearings Soon on Proposed St. Louis Franchise

Provision for a $1,000,000 revolving fund is embodied in the incomplete franchise ordinance in favor of the United Railways, St. Louis, Mo., which Mayor Victor J. Miller will soon present for public consideration. This fund is an integral part of the service-at-cost principle on which the franchise will be based. If this fund gets too low fares will be raised; if it increases too much, fares will be reduced.

The tentative franchise draft also provides for a traffic commissioner who will look after the city's interests in the operation of the railway system. The salary of this director and the expenses of his office are to be paid by the company, but the total of both must not exceed $50,000 annually.

Members of the reorganization committee of the United Railways do not wish to have included in the grant a provision against the use of one-man cars and other regulatory measures sought by the car men's union; also the reorganization committee wants a 7 per cent return to the company before the payment of taxes.

Other points at issue are the continuation of the mill taxes and other special taxes, such as street improvement and repairs, now assessed against the company. The City Board of Estimate and Apportionment, which has considered the desires of the company officials in this regard, realizes that under the service-at-cost system the car riders pay the taxes, but pleads the necessity for maintaining the taxes as the city cannot increase its tax revenue in the regular channels.

Mayor Miller plans to leave these points open in the draft of the measure to be submitted for public consideration so that he can obtain the reaction of the citizenry.

Stagger System Suggested for Smoky City

The stagger system of spreading rush hours to relieve congestion in the downtown triangle has been officially approved by the Better Traffic Committee at Pittsburgh, Pa., and definite steps have been taken to bring about the cooperative use of the system.

Adoption of the stagger system was proposed by Frank L. Duggan, as chairman of the sub-committee on traffic flaws, which voted unanimously a few days ago to approve and recommend the system for adoption. The outcome of a rather brief discussion was that the committee members passed a motion which entitles Mr. Duggan's subcommittee to continue in a campaign which it is hoped will result in the general use of the system.

Proponents of the system, led by Mr. Duggan and Mr. Marsh, pointed out that the worth of the system might be studied in cities where it is now in use, such as New York, Cincinnati and Chicago. It was also cited that the stagger system is being used successfully by several large Pittsburgh concerns and in some of the larger office buildings. The Pittsburgh Building Owners and Managers' Association's approval and indorsement of the system was used as a favorable argument. It was made clear that the committee was not rushing blindly into the matter, but was merely approving the idea, without taking any rash action. This swayed the skeptics and the motion was passed.

Deadlock Over Toledo Wages

Representatives of the Community Traction Company, Toledo, and the car men's union have been deadlocked for nearly a month on the wage issue in the new contract between company and employees. The wage scale June 1 was 50 cents for the first three months, 52 cents for the next nine months and 55 cents thereafter, with 5 cents an hour added for one-man or bus service.

The men asked a flat increase of 10 cents an hour and the company prepared to grant them 2 cents an hour with certain arrangements for part rebate on new uniforms. J. Frank Johnson, vice-president and general manager of the company, following the rejection of the company offer, wrote Mayor Fred J. Mery and the members of the Board of Street Railway Control that the increase asked by the men, if granted, would mean a sure advance in token fares on the railway lines. This announcement apparently drew no comment from those officials and the situation has remained with no agreement.

The old contract provided for arbitration of differences in case an agreement could not be reached. So far neither party appears to desire to submit the problems to arbitration.

Talk of Terminal Electrification Renewed at Chicago

The promise of electrified operation of suburban trains of the Illinois Central Railroad by July 15 has revived talk in Chicago of universal electrification of the city's railway terminals. Clamorous editorials based on recent news articles describing the results of similar undertakings in New York and Philadelphia are appearing in Chicago newspapers almost daily.

Sentiment in favor of this civic improvement was first actively aroused in 1915, when the railroads that enter Chicago, under the guidance of the Association of Commerce, compiled and published an elaborate report on terminal electrification after four years of investigation. The report estimated the cost, including parallel betterments that would be necessary, at $274,440,630. The railroads announced that under existing conditions the project was financially impracticable and the matter presently languished.

Mayor William E. Dever thinks that it is now opportune to reopen negotiations. He has asked the City Council to appoint a committee to learn the attitude of the various railroads and navigation companies toward a program looking to reasonably prompt replacement of their existing smoke-producing locomotives and tugs by electric or oil-electric equipment. He suggests, further, that the committee prepare legislation similar to that passed in New York requiring the elimination of smoking railway and navigation equipment after a fixed date.

They Rented the Entire Trolley System

Down in Jacksonville, Fla., Cohen Brothers wanted recently to put on a big sale. In order to be certain that all the Kellys who desired to come down town to shop on the opening day would get there they chartered the entire railway system, with excellent results.

The Jacksonville Traction Company has a peak hour from 7:30 in the morning to 9. After that traffic is light until the evening peak hour. This starts around 4 in the afternoon. The entire trolley system was Cohen Brothers' for two hours from 9 in the morning until 11. During that time everybody, regardless of where they boarded the car and regardless of where they were going, rode free. Circus days had nothing on the two hours of the opening day of this sale. Free trolleys were a great success.

In renting the system to the department store the railway took the number of cars on schedule and the seating capacity and arrived at the total seating capacity for those two hours. Then the management multiplied this number by 6.7 cents, which is the average fare in Jacksonville. The nearest even product of this multiplier and multiplicand was accepted as the flat rate to charge the department store for the rental of the system. In this case it was $350. This was the price that Cohen Brothers paid for the rental of the entire trolley system for two hours.

In checking up after the day's business it was found that after deducting the $350 rental paid to the railway by Cohen Brothers the revenue for the day was just $20 less than the total business done on the similar day of the previous week. Adding the $350 rental fee the day's gross revenue was more than $300 greater than on the similar day of the previous week. So from the viewpoint of the railway the sale by Cohen Brothers was a financial success.

Officials of Cohen Brothers report that their lease of the railway was one of the best advertising stunts that they ever "pulled." They used liberal newspaper space, but the total cost of all of the advertising was less than 1 per cent of the volume of business done, a figure considered remarkably low. Much of the success of the sale they attribute to the free trolley idea.

Large Sums Paid Into Welfare Fund

The Twin City Rapid Transit Company, Minneapolis, Minn., paid $63,232 into the welfare fund for employees in 1925, while the employees paid $34,618. For the year the budget was $100,123. Payments to beneficiaries of employees who died in the year were $71,000. Insurance for total disability was $5,600. Among other payments were $1,687 for 58 accident disabilities and $19,379 in 940 cases of illness. At the end of the year the total in the thrift fund was $291,615. Among the activities conducted for employees are mentioned operation of a 40-piece band, trainmen's clubrooms, trainmen's baseball league and entertainments for families.

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Experts Will Make Surveys in Cincinnati

The sub-committee of the City Council of Cincinnati, Ohio, named to negotiate a lease for the rapid transit system to the Cincinnati Street Railway has agreed to engage experts to make traffic surveys before entering into any definite agreement with the railway for the operation of the system. The experts will be employed as soon as the committee can reach an agreement as to who shall pay the cost of making the survey. Some members of the committee are of the opinion that part of the expense should be defrayed by the street railway, car riders and taxpayers. Others contend that it should be a 50-50 proposition between the railway and the city.

The experts to be employed, it was agreed, must determine three major questions: What changes are to be made if any in the plan of the rapid transit system to co-ordinate its use with the surface lines to insure operating success? What patronage reasonably may be expected for the system? How can traffic be diverted from the surface cars and what would be the effect upon the fare now being charged on the present system?

The committee is in receipt of letters from a number of experts regarding making the survey. E. P. Goodrich, former vice-president of the New York Technical Advisory Corporation; Ross W. Harris, Madison, Wis.; the Beeler Organization, New York, and Kelker, De Leuw & Company, Chicago, have applied for the contract to make the survey, the cost of which is estimated at $50,000.

Rehabilitation Promised in Boise

The immediate rehabilitation of the lines and equipment of the Boise Street Car Company, Boise, Idaho, was promised the City Council recently by W. E. Pierce, president of the company. Mr. Pierce said he expected to pay all tax delinquencies, repair the lines and go ahead with the transportation system as it is at the present time. It is likely there will be a bus connection with the railroad station carrying passengers from the station to some downtown point. For many months the Council has been discussing the transportation problem in Boise with Mr. Pierce and, until recently, with W. E. Young, Portland, who wanted to put buses on the streets of Boise.

Voters Not Likely to Have Franchise Question This Summer

No hope for submission of a franchise amendment to the voters of Toledo, Ohio, at the August primary election is held out by those in close touch with municipal affairs.

The supplementary report of Prof. H. E. Riggs, furnished a few weeks ago, containing the memoranda of agreements on engineering matters connected with a solution of Toledo transit problems between Professor Riggs and engineers representing Henry L. Doherty & Company, has been ordered printed by the City Council and the Mayor has been authorized to negotiate further with Mr. Doherty. Members of the Street Railway Board of Control expressed the opinion that Mr. Doherty should easily be able to agree to everything in the supplementary report, but that there were other fundamental problems in connection with a settlement of issues in Toledo that have not been touched.

Difficulties of writing off a portion of the capital, adjusting the deficit in the stabilizing fund and the sinking fund and the problem of raising new money for the $2,000,000 or more capital required are all matters to be worked out before any proposal may be submitted to the voters.

Wage Agreement Renewed at Ottawa

The Ottawa Electric Railway, Ottawa, Canada, renewed its wage agreement with its trainmen on June 11. The present agreement, which will remain in force until May 1, 1928, provides for the following wages in cents an hour: For first year conductors and motormen 45 cents; second year, 47 cents; third year, 48 cents; fourth year and thereafter, 50 cents; for one-man car operators 5 cents in excess of the regular rate.

The phraseology of this agreement permits an understanding with any individual employee or any group of employees. It is a strictly open shop agreement, but it guarantees no discrimination against membership in a union or other association.

Labor Question at Indianapolis in Courts

Dismissal of a suit filed by the Indianapolis Street Railway, Indianapolis, Ind., against the Amalgamated Association, Robert Armstrong and John M. Parker, vice-presidents, was asked in two motions filed in the federal court on June 16 by Frank P. Baker, attorney for the defendants. The motions were filed on behalf of the organization and the two officials. The first declared there is no diversity of citizenship and the other alleged that a statute cited prohibits the court from granting a permanent injunction against the organization to prevent it from attempting to unionize the employees of the local utility. A temporary injunction recently was granted by the court to prevent the Amalgamated from continuing its work of organizing the employees.

Third Arbiter Named.—After more than two months of negotiations Judge Malcolm R. Patterson, former Governor of Tennessee and now Circuit Court judge, was selected as the third arbitrator in the wage dispute existing between the trainmen and officials of the Memphis Street Railway, Memphis, Tenn. The two other arbitrators are Lovick P. Miles for the company and A. B. Galloway for the motormen and conductors. The men seek an increase of 12 cents an hour. The company has a counter proposition calling for a decrease in wages.

Lower Rates in Effect.—Special excursion tickets at a fare of $2 for the round trip between Los Angeles and Mount Lowe, Cal., were placed on sale by arrangement of the passenger traffic department of the Pacific Electric Railway, Los Angeles, Cal. Tickets at this reduced fare are sold for use on Wednesdays and Saturdays only, the regular fare of $2.50 remaining in effect during other days of the week. Return limit of the tickets is seven days from date of sale, which allows passengers an opportunity to stay over at Mount Lowe Tavern and cottages, should they so desire. The rate from Pasadena in connection with this Wednesday and Saturday special excursion fare is $1.75 for the round trip, in place of the regular fare of $2.10.

Service to White Plains Increased.—Leverett S. Miller, president of the New York, Westchester & Boston Railroad, announced on June 20 that trains would be operated between New York and White Plains every twenty minutes, 24 hours a day, beginning July 1. At present only one or two trains are run to White Plains between midnight and 6:30 a.m. The increase in the passenger traffic of the road caused the change in the schedule, it is said. In 1925 the passenger traffic increased 14 per cent.

Wage Scale Renewed in Youngstown.—The wage scale for the trainmen and bus operators of the Pennsylvania-Ohio Electric Company and the Youngstown Municipal Railway, Youngstown, Ohio, was continued recently by agreement for another year. The wage scale for two-man operation is 48 cents an hour for the first three months of employment, 51 cents an hour for the next nine months and 57 cents an hour after the first of the year. For one-man operation 5 cents an hour additional is paid on each of these classifications. However, the company has virtually no two-man operation, so that the dominant rate is 62 cents an hour.

Music Lovers Given Special Service.—The United Railways, St. Louis, Mo., has put on special service on its Delmar division to accommodate patrons of the Garden Theater, which opened its season on June 14. At the terminus of the Delmar division in University City extra cars transfer the operagoers direct to the theater.

Asks 15 per Cent Rate Increase.—Declaring that the average increase in cost over 1914 prices has been more than 110 per cent, compared with an increase in rates over the same period of only 24.4 per cent, the Chicago, Aurora & Elgin Railroad, Aurora, Ill., filed a petition on June 15 with the Illinois Commerce Commission in which permission was asked to increase passenger rates 15 per cent. The new rates would become effective July 15. The petition contends that the rate increase would bring fares up to the existing commutation rates of the steam railroads. Suburban rates on several of the steam railroads entering Chicago were raised, last January, 15 per cent, and on others approximately 20 per cent. Britton I. Budd, president of the company, points out that the earnings on the company's investment are grossly inadequate.

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Recent Bus Developments

Steam Road Not Disposed to Test Minnesota Bus Act

The railroads have, for the time being at least, dropped their legal fight against the Minnesota law, passed by the last Legislature, controlling the operation of buses over public highways. On the eve of the hearing of a suit on June 15, brought by the Chicago Great Western Railroad against the Jefferson Highway Transportation Company in the Hennepin District Courts to test this phase of the law, giving the Minnesota Railroad and Warehouse Commission charge of bus routes and rates, the railroad dropped the action. The Jefferson company runs a bus line parallel to the Great Western tracks to Rochester, Minn., and each carries thousands of passengers annually. The steam line's contention was that when a steam road served between two points a bus line should not have permission to operate also. The road is now expected to try to win its point by competition.

The steam road runs regular service between the Twin Cities and Rochester and has a special daily round-trip Red train to serve especially patrons of the Rochester hospitals. The bus company has been operating parlor coach buses and contended that there was a public demand, both as a necessity and a convenience, for this service over one of the most heavily traveled rural routes in the state. The commission granted the certificate and held in abeyance the route and rate of fare. This supplementary order was delayed on account of the suit in court. E. F. Zelle, president of the Minnesota Motor Bus Association, said:

> We regard the decision of the Great Western as far reaching, since it indicates the railroads recognize the highway motor bus as a fixed institution in the transportation system and a service the public demands as necessary and convenient.

A. G. Briggs of counsel for the railroad said:

> We believe we will be able to obtain our share of the business. The railroad now proposes to fight it out with the Jefferson on the basis of competitive service, rather than by litigation.

The action as brought by the railroad was the first appeal, as permitted under the new law, from a decision of the commission. It was filed April 21 from the commission's order of March 26. On May 26 the court issued an order setting the trial for June 15 and before that time a stipulation of dismissal was filed.

Chester Lines Absorb Cab Service

Charles B. Cooke, Jr., president of the Chester Valley Lines, which includes the Westchester Street Railway, West Chester, Pa., has announced the acquisition of all the holdings of the Wilmington Yellow Cab Company from Frank V. du Pont, J. A. Montgomery, G. Dare Hopkins and Hollyday S. Meeds, Jr. Effective on July 1 the new management will operate the cab service in conjunction with the Chester Valley Lines system. This system includes more than 200 miles of bus routes in the Schuylkill Valley section, southeastern Pennsylvania and the upper part of the State of Delaware.

Employees Fail to Stop Bus Operation

Judge Sanderson in the Massachusetts Supreme Court has dismissed the petition of the Amalgamated Association in which it sought to enjoin the Boston & Worcester Street Railway and its receiver, Franklin T. Miller, from operating buses between Boston and Worcester.

According to the petition, the Amalgamated employees contended the railway was under agreement with it not to institute new methods of transportation not covered by the agreement without first submitting the question to a conference. The railway and its receiver argued that the receiver could not be sued without express permission from the court, of which he is an officer.

This action by the union was the subject of an item in the ELECTRIC RAILWAY JOURNAL for June 5, page 990, in which it was brought out that the union contended that bus transportation jeopardized positions held by members of the association and that the agreement between the union and the railway provided that at the introduction of a new method of transportation the matter of the status of the employees would be settled by a conference between the union and the company.

Utilities Commission Should Regulate Utah Buses

The question as to whether the Public Utilities Commission has the right to control the operation of auto stage lines, or other motor vehicles which use the public highways for transporting either freight or passengers as common carriers was settled by the Utah Supreme Court on June 2. The opinion, handed down in the case of T. M. Gilmer against the Public Utilities Commission and others, and written by Justice J. E. Frick, held that such control and regulation are within the right and power of the commission. The judge declared that the purpose of the utilities act is to prevent one public utility from destroying another.

The difficulty arose when T. M. Gilmer petitioned to increase the service of the bus line between Salt Lake and Fillmore after he had obtained it from the original owner, Joseph Carling, who operated only one round trip between the two points each week. Among the protestants were the Orem line and the Los Angeles & Salt Lake Railroad. The commission denied the application and also denied a request for a rehearing of the case.

Rhode Island Demands Bonds

Suspension of the public service registrations of 33 buses operating in interstate commerce out of Providence, R. I., was announced on June 17 by the State Board of Public Roads. Following this, Deputy Chief Inspector Harold W. Shippee and several assistants started to remove the public service plates from the vehicles involved as they appeared at the bus terminals in Eddy Street on their regular schedules.

The suspension and removal of registration of the buses was based on the failure of the owners of the vehicles to file bonds with the State Treasurer for the protection of the public in case of accident.

As each bus drove into the terminal Mr. Shippee told the driver that he could either put his bus in a garage or run it out of the state and keep it there, the alternative being arrest. One of Mr. Shippee's assistants would remove the public service plate from the front of the bus. That ended the process.

Twenty concerns operate the 33 buses banned from the roads. About 135 buses remain in interstate traffic.

Hearing on Western Motor Coach

Because of insufficient evidence the hearing on the application of the Western Motor Coach Company to operate buses between Chicago, Ill., and western suburbs in competition with three steam railroads was continued from June 15 to June 30. This company recently applied for a certificate of convenience and necessity to operate buses on four main routes out of Chicago following in general the line of the Chicago, Aurora & Elgin Railroad and supplementing that service.

More Bus Substitutions in Akron

Application has been filed with the city of Akron by Northern Ohio Power & Light Company for the abandonment of three of its Akron city car lines. The company desires to substitute buses on these lines. The lines are the Bowery Street, North Howard Street, and Grant Street. A conference between officials of the company and city officials was held on June 23. Action probably will be taken on June 29.

Line in Olean Approved.—The Public Service Commission authorized on June 18 the Olean, Bradford & Salamanca Bus Line, Inc., subsidiary of the Olean, Bradford & Salamanca Railway, to operate a bus line in the city of Olean, N. Y., and from that city to the village of Richburg. The proposed route will be about 21 miles in length. Four round trips will be operated daily and the through fare each way will be $1.10. It is understood that the Olean, Bradford & Salamanca Railway will now undertake proceedings to abandon that part of its trolley line extending from Portville to Bolivar, and thereafter the residents of this territory will receive service from the new bus line. The proof presented to the commission on the application in this case was to the effect that the operation of the trolley line to Bolivar was unprofitable.

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Financial and Corporate

Companies in Middle West to Be More Closely Affiliated

Changes have been announced in the North American Light & Power Company which will result in the Studebaker interests being joined by the North American Company and the Middle West Utilities Company, the latter a Samuel Insull group, in the common stock ownership. Clement Studebaker, Jr., will remain as president of the company.

The North American Light & Power Company, serving 700 communities in Illinois, Iowa, Missouri and Kansas, through subsidiaries, is the holding company which owns the common stock of the Illinois Power & Light Corporation, of which Senator William McKinley of Illinois has been chairman of the board. The latter company is the Studebaker-McKinley operating company which owns the McKinley Bridge at St. Louis and the Illinois Traction System, the longest electric trunk line railroad in the world.

A large share of the common stock of North American Light & Power will be taken over by the Middle West company and the North American Company, the oldest and largest utility holding corporation in the Middle Western States. The operating staff of the North American Light & Power will remain unchanged.

The subsidiaries, Illinois Light & Power, Missouri Power & Light and other operating companies, will not be affected by the reorganization.

Certain new financing of the North American Light & Power is in prospect, Mr. Studebaker said, but the plans are not completed.

Interconnection with power lines of the Middle West Utilities subsidiaries will be one of the chief benefits of the reorganization. The consolidations will enable the plants of the two groups to unite high voltage, long-distance transmission lines over a greater part of the Central West.

Protective Committee for Indianapolis & Northwestern

A committee has been formed to protect the interests of holders of the 5 per cent twenty-year first mortgage bonds of the Indianapolis & Northwestern Traction Company, Indianapolis, Ind. The members are D. P. Abercrombie and George Treat of E. H. Rollins & Sons, B. L. Allen, vice-president Irving Bank-Columbia Trust Company; C. F. Mills, vice-president First National Bank of Boston; E. W. Stout, vice-president Fletcher American National Bank of Indianapolis, and Oscar Haussermann, 1 Federal Street, Boston, secretary.

The committee purposes to act in the proposed merger by consolidation or sale of the Terre Haute, Indianapolis & Eastern Traction Company and subsidiaries with the Terre Haute Traction & Light Company, the Indiana Electric Corporation and the Central Indiana Power Company and subsidiaries.

The committee has announced that when the readjustment plan and agreement have been perfected and approved, depositing bondholders will have the right to inspect the plan or to withdraw bonds without expense within two weeks.

$5,000,000 from Receivers

This Amount Turned Over to Special Master by the Kansas City Railways Operators

Funds in the hands of the receivers of the Kansas City Railways, Kansas City, Mo., aggregating more than $5,000,000 were turned over to John T. Harding, special master commissioner, on June 19. Of this amount, $5,038,109 was in United States securities at the market value of June 16, 1926; $39,131—the accrued interest at June 16 on the securities; $148,902 representing the final payment on court order of Sept. 3, 1925, providing for the partial distribution to bond and note holders in the sum of $1,599,788; and $21,356 in cash. A sum amounting to $250,000 was left in the hands of the receivers for working capital, assuring operation until the transfer of the property is complete.

In confirming the sale of the Kansas City Railways to the new Kansas City Public Service Company during the week ended June 19, Judge Kimbrough Stone expressed the opinion that the receivership should be terminated and the property transferred to the new owners about Sept. 15.

An appeal from the confirmation was taken by Blatchford Downing, attorney for the second mortgage bondholders. His appeal will have no effect on the ending of the receivership. It will be heard in the Eighth Circuit Court of Appeals, probably at the December term in St. Louis. One of Mr. Downing's main contentions is that his clients were circumvented illegally when the first mortgage bondholders settled with the personal injury claimants and lawyers, whose claims were junior to the second mortgages.

The allowances made by the court to the receivers and to those connected directly and indirectly with the receivership, as announced in ELECTRIC RAILWAY JOURNAL for June 19, page 1076, aggregated $700,000 for the full period of the receivership. Frank P. Sebree, attorney for the stockholders of the old company, voiced the only protest to the allowances. Judge Sebree has 60 days in which to appeal from the confirmation. However, the case of the second mortgage bondholders now is severed from that of the stockholders.

The biggest task remaining before the property is turned over to the new owners is the assembling and indorsement by Mr. Harding of about $23,000,000 in first mortgage gold notes on deposit in bank vaults in several large cities. These bonds will be assembled in a vault in the Federal Reserve Bank in Kansas City within the next 30 days. They will be turned in as payment for the company and new securities issued to the holders.

Gross and Net Earnings Increase on Illinois Power

During 1925 the gross earnings from operation of the Illinois Power & Light Corporation, Chicago, Ill., after eliminating inter-company items, increased about 9 per cent and the net earnings on the same basis, after maintenance and taxes, increased approximately 16⅔ per cent over the previous year. At the same time the ratio of operating expenses to gross income was bettered by 2.36 per cent. The ratios of earnings available for bond interest and preferred stock dividends were well maintained and the company's securities continued to enjoy a good market and a steady demand. These statements were included in the annual report to the stockholders of the company.

In the railway division many improvements and extensions of service have been made. One hundred freight cars have been added to the rolling equipment, a new storehouse has been built at Decatur and a new passenger and freight terminal completed at Joliet.

Throughout the entire Illinois Traction System new ballasting was steadily going on and much new heavy rail laid, with the result that the roadbed is in good condition. Seven new automatic substations have been placed in operation, six new 1,000-hp. electric locomotives have been put into service and connection made with the St. Louis, Troy & Eastern Railroad, tying the two together as an operating unit. The first group of twenty-two 1-ton trucks, for use in extending the growing express business to include a daily pick up and delivery at terminals, has been installed with marked success.

From an insurance and protection standpoint the showing has again been very creditable. Every employee is covered by the $500 policy of group insurance provided by the company and

COMPARATIVE STATEMENT OF EARNINGS OF THE ILLINOIS POWER & LIGHT CORPO RATION

Gross Earnings	1925	1924
Electric light and power	$15,817,324	$13,871,432
Electric and steam railroads	6,763,656	6,032,489
City railways and bus lines	4,248,821	4,258,005
Gas	3,191,720	2,973,364
Heat	672,394	685,777
Bridge	589,691	591,240
Ice	254,670	169,027
Water	88,303	101,125
Miscellaneous	21,816	1,239
Combined gross earnings	$31,648,398	$28,683,702
Less inter-company	2,566,345	1,984,273
Gross earnings from operation	$29,081,553	$26,699,429
Expenses and taxes	18,472,214	17,592,058
Net earnings from operation	$10,609,339	$9,107,380
Other income	203,445	500,585
Total net earnings	$10,812,784	$9,607,966

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on Dec. 31, 1925, 3,826 were members of the death benefit division of the Hospital Association. Forty-seven deaths occurred among the employees during the year and more than $50,000 was received by their beneficiaries. Attention was paid to the educational, safety and accident prevention work.

$1,250,000 North Shore Bonds Sold

Halsey, Stuart & Company, New York, and the National City Company, New York, recently offered for subscription at 96½ and interest, yielding about 5.75 per cent, $1,250,000 of first and refunding mortgage 5½ per cent gold bonds, series B, of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill. The bonds come due April 1, 1956. The bonds were issued on account of the construction of the extension of the company's line from Niles Center to a point on the main line near Lake Bluff, Ill.

Railway's Revenue Decreased.—The Barcelona Traction & Power Company, Ltd., Barcelona, Spain, reports a revenue of $3,678,234 in 1925 against $2,999,287 in 1924. The balance realized in 1925 is $1,248,096 against $74,672 in 1924. The revenue of the railway department for the year showed a considerable decrease, resulting partly from an accident on the railway of the Ferrocarriles Cataluna between Las Planes and Sarria, which resulted in many deaths and injuries. Revenue was also decreased because of the lower spending power of the working classes. The company carried 17,527,373 passengers in 1925.

New Jersey Earnings Increase

For the first four months of 1926, net income of the Public Service Corporation of New Jersey available for dividends was $4,989,998, an increase of $2,127,093, or 74.3 per cent over the corresponding period of last year. After preferred dividend requirements, this was equivalent to $3.14 a share on 1,192,371 shares of common stock outstanding April 30, against $2.16 a share earned on 886,774 shares outstanding April 30, 1925.

Net income for the year ended April 30, after all charges, including depreciation, totaled $12,122,418, a gain of $4,214,336, or 53.3 per cent over the preceding twelve months, and equivalent, after preferred dividends, to $7.27 a share on the above amount of common, as compared with $6.03 in the preceding twelve months.

Railway and bus earnings in April showed further improvement. Combined operating revenues were $2,721,053, an increase of $337,133 over April of last year, while operating expenses of $2,197,275 were $211,389 greater. The Public Service Railway net income for the month was $85,631, against $11,407 a year ago. The Public Service Transportation Company, which operates the buses, reported net income of $18,663, compared with a deficit of $24,459 in April, 1925. Combined net income was $104,294, against a deficit of $13,051 in the corresponding month last year.

For the first four months of this year, the consolidated statement of trolley and bus operations showed a deficit of $317,715, against $898,698 for the corresponding period of 1925. For the twelve months ended April 30, the deficit was $124,198, against net income for the preceding twelve months of $1,122,647, which resulted from the intercompany sale of the Public Service Newark Terminal and real estate adjacent thereto.

More Properties Taken by Southeastern Power & Light

The Southeastern Power & Light Company has acquired the Georgia Light, Power & Railways, Athens Railway & Electric Company, Georgia Southern Power Company and the Georgia Utilities Light Company. These companies serve 42 municipalities. They will be supervised by the Georgia Railway & Power Company, which recently was acquired by Southeastern.

Georgia Light and Athens Railway were acquired from the Henry L. Doherty interests. An issue of $12,500,000 of debentures offered this week by Southeastern will be used in part to pay for the purchase and to finance additions which will increase the output of the system by 100,000 hp.

Net on Havana Railway Division, $486,275

The railway department of the Havana Electric Railway, Light & Power Company, Havana, Cuba, during the year ended Dec. 31, 1925, used 33.2 per cent of the power plant output, against 32.3 per cent in 1924, and operated 8.44 per cent more car-miles. The gross earnings from operation increased 5.65 per cent, forming 40.9 per cent of the total for the company, and the net earnings decreased 6.10 per cent and were 23.4 per cent of the total for the company. The decrease in net earnings compared with 1924 is due largely to the increase in car mileage required by the track extensions over which operation was begun late in 1924 and early in 1925, where the traffic has not yet had time to develop. These statements were contained in the annual report to the stockholders for the year ended Dec. 31, 1925.

The number of passengers carried in 1925 was greater each month than in 1924. The gain in revenue, however, was more than offset by the cost of additional car-miles operated plus the increase in wages of car, shop and trade employees. More attention was given to the regulation of street traffic by the police, and the number of collisions, although somewhat reduced, 829 compared with 957 in 1924, was still an evidence of the difficulties of operation in the crowded streets of the business districts, where nearly all the collisions occur.

The main line was increased by 1.66 miles of single track, the yards by 0.4 mile, and 1.95 miles of existing track was reconstructed. These track extensions, together with those completed in 1923 and 1924, brought about an increase in traffic which has necessitated the additional equipment. Seventy-three new model passenger cars were built, equipped and put in service, 24 old type cars were retired and dismantled and the bodies were scrapped, but all

Conspectus of Indexes for June, 1926

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	June 1926 **7.37**	May 1926 **7.36**	June 1925 **7.27**	June 1926 **7.37**	May 1923 **6.88**
Electric Railway Materials* 1913 = 100	June 1926 **154.4**	May 1926 **153.1**	June 1925 **152.4**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Electric Railway Wages* 1913 = 100	June 1926 **225.5**	May 1926 **225.4**	June 1925 **222.4**	Sept. 1920 **232.0**	March 1923 **206.8**
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	June 1926 **201.9**	May 1926 **202.4**	June 1925 **200.0**	July 1920 **256.4**	May 1922 **167.4**
Eng. News-Record Construction Cost (General) 1913 = 100	June 1926 **204.8**	May 1926 **207.3**	June 1925 **204.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	May 1926 **151.7**	April 1926 **151.1**	May 1925 **155.2**	May 1920 **246.7**	Jan. 1922 **138.3**
Bradstreet Wholesale Commodities 1913 = 9.21	June 1 1926 **12.80**	May 1 1926 **12.86**	June 1 1925 **13.62**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	May 1926 **161.1**	April 1926 **162.4**	May 1925 **151.6**	July 1920 **219.2**	Mar. 1922 **138.7**
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	May 1926 **167.8**	April 1926 **168.4**	May 1925 **165.3**	July 1920 **204.5**	Aug. 1922 **154.5**
Steel Unfilled Orders (Million Tons) 1913 = 5.91	May 31 1926 **3.649**	Apr. 30 1926 **3.868**	May 31 1925 **4.050**	July 31 1920 **11.118**	July 31 1924 **3.187**
Bank Clearings Outside N. Y. City (Billions)	May 1926 **18.17**	April 1926 **18.65**	May 1925 **17.21**	Oct. 1925 **20.47**	Feb. 1922 **10.65**
Business Failures Number	May 1926 **1640**	April 1926 **1743**	May 1925 **1572**	Jan. 1924 **2231**	Aug. 1925 **1353**
Liabilities (Millions)	**32 64**	**47 34**	**39.75**	**122.95**	**27.22**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. Previously the wage index applied to 144 railways. The change is due to dropping some roads where the number of trainmen has been reduced to a total of less than 100.

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STATISTICS OF ELECTRIC RAILWAY SERVICE, HAVANA ELECTRIC RAILWAY, LIGHT & POWER COMPANY

	1924	1925
Kilowatt-hours used	34,139,235	38,485,913
Total number of passengers carried	114,872,616	121,625,500
Passenger car-miles	18,028,046	19,550,302
Passenger earnings	$5,743,630	$6,081,275
Passenger earnings per car-mile	$0.3186	$0.3111
Gross earnings from operation	$5,924,606	$6,259,208
Operating expenses and taxes	$4,120,948	$4,565,601
Net earnings from operation	$1,803,657	$1,693,606
Operating expenses and taxes per car-mile	$0.2285	$0.2335
Operating ratio, per cent	69.56	72.94

STATEMENT OF OPERATION OF THE RAILWAY DIVISION FOR THE YEAR ENDED DEC. 31, 1925, HAVANA ELECTRIC RAILWAY, LIGHT & POWER COMPANY

Earnings:		
Cars	$6,185,647	
Miscellaneous	73,560	
Gross earnings		$6,259,208
Operating Expenses and Taxes:		
Maintenance	$859,984	
Transportation	3,128,492	
General, including taxes	577,124	
Total operating expenses and taxes		4,565,601
Net earnings from operation for 1925		$1,693,606
Deductions for Division:		
Interest	$585,265	
Reserved for depreciation and contingencies	622,065	
Total		1,207,330
Net income for the division for 1925		$486,275

of the equipments and fittings worth salvaging were repaired for use again. The net gain was 49 new cars.

The fourteenth annual report of the Havana company includes the report of the general manager for 1925, as well as a statement of Warren Bicknell, consulting engineer to Frank Steinhart, president of the Havana properties. The accompanying table shows the statistics of the electric railway department in 1925 compared with 1924.

Alton Properties Sold Under Foreclosure

All properties of the Alton, Granite & St. Louis Traction Company and Alton Gas & Electric Company were sold under foreclosure at the Madison County Court House in Edwardsville, Ill., on June 16. The properties were sold in five parcels and brought a total of $1,965,000. The only bidder at the sale was Louis H. Egan, president of the Union Electric Light & Power Company, St. Louis, a member of the bondholders' committee. The other committee members are F. J. Boehm, St. Louis, and Allen Van Wych, New York City. Like the property sold at auction, the Union Electric Light & Power Company is controlled by the North American Company. The latter company controlled the Alton, Granite & St. Louis Traction Company and the Alton Gas & Electric Company through the East St. Louis & Suburban Railway, another of its subsidiaries. It is understood that the bondholders plan to reorganize the properties into three companies, each to be operated separately.

The sale was held by Louis Clements, Danville, Ill., special master of the United States District Court for the Eastern District of Illinois, under an order issued by Judge Lindley on a petition of the trustee for the bondholders. The companies had not paid interest on the $3,500,000 bond issue since February, 1920. The Alton, Granite & St. Louis Traction Company's interurban lines between St. Louis and Alton brought $700,000 and the city lines in Alton, Venice and Brooklyn, $180,000. The railway has been in receivership since 1920. T. W. Gregory, East St. Louis, was receiver.

Net Income Higher.—The total operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for the eleven months ended May 31, 1926, was $40,974,038 against $39,550,536 for a similar period in 1925. Total operating expenses increased from $25,930,098 to $26,657,437. After the consideration of income deductions, a net income remained of $5,221,837 in the 1926 period and $4,643,080 in the 1925 period.

Reports Indicate Ohio Traffic.—City and suburban electric railways in Ohio in 1925 carried 871,509,382 passengers, according to a compilation of annual reports submitted to the Ohio Public Utilities Commission. This compilation shows that the total revenue of 110 interurban lines and sixteen city lines in the state was $65,405,795. The operating expenses of these companies aggregated $55,439,846, in addition to taxes of $6,098,010. The estimated investment of electric railway property alone, excepting the property not used for electric railway purposes in the case of dual service companies, was $316,035,385 as of Jan. 1, 1926. The total mileage operated in the state in 1925 was 3,038.

Deficit in Toledo.—A deficit of $14,960 resulted from May operations of the Community Traction Company at Toledo, Ohio, in spite of a better average daily business than in May of last year. The company carried 4,178,773 revenue passengers, collecting $292,037 passenger revenue, compared with $286,904 for May, 1925. Operating charges were $225,204, or $6,751 increase over May a year ago, while there was a loss of revenue from interurban track rentals. Feeder bus lines of the traction company carried 55,368 passengers. Revenue was $2,013 and cost of service $3,685. The Oak Street line operated at only a slight profit.

New Director Fills Vacancy.—Alfred F. Pillsbury, treasurer of the Pillsbury Flour Mills Company, Minneapolis, has been elected director of the Twin City Rapid Transit Company, Minneapolis, Minn., succeeding the late E. Pennington, chairman of the board of the Minneapolis, St. Paul & Sault Ste. Marie Railroad.

Taxpayers Pay in Seattle.—An assertion that the failure of Seattle, Wash., to rehabilitate its Municipal Railway system by "rapid transit" is adding about 10 per cent to the taxpayers' bill is made by William Pitt Trimble, chairman of the rapid transit committee of the Seattle City Planning Commission. Mr. Trimble presents figures to show that if the Stone & Webster interests now operated the lines their franchise tax would be $120,000 a year, which, with other costs placed on the taxpayer, brings the figure up to $650,000 a year. "Figured at this rate for the seven years the city has owned the lines," Mr. Trimble said, "the taxpayers have assumed a total burden of $4,500,000. The lines have paid Stone & Webster $4,200,000 on the principal, so the taxpayers have paid $300,000 more than the lines have paid Stone & Webster.

Trustees Appointed to Sell Property.—Walter C. Capper and J. Elmer Carter, Cumberland attorneys, were appointed on June 17 trustees to sell the property of the Cumberland & Westernport Electric Railway, Frostburg, Md., by Judge William C. Walsh of the Circuit Court. The order was made on a petition signed by the Real Estate & Trust Company, Philadelphia, which alleged that the company defaulted in payment of interest and principal on the $660,000 bonds secured by a mortgage on the property. The defendants to the suit admitted the allegation and the road will be offered for sale as three separate companies and also as a whole. The road, which operates 21 miles, went into the hands of a receiver on June 29, 1925. Reference to the receivership was made in ELECTRIC RAILWAY JOURNAL, issue of July 11, page 73.

Invitation to Purchase Additional Shares.—The reorganization committee for the United Railways of St. Louis, Mo., in connection with subscription receipts for common stock of the St. Louis Public Service Company, which are now being traded in on the St. Louis Stock Exchange, notices of which are now being mailed out to holders of record June 15, 1926, invites the holders to purchase on or before July 1, 1926, at $12.50 per share such additional shares as have not been subscribed by holders of certificates of deposit for the St. Louis Transit Company's 5 per cent bond. The right to purchase additional shares is on the basis of one-tenth of one share for each 1½ shares represented by the subscription receipts.

Sale Approved.—The Public Service Commission of New Hampshire has approved the sale of the Laconia Street Railway, Laconia, N. H., to Guy Tetley and Howard Byse. The owners were also given permission on their recent petition to issue capital stock to themselves to the amount of $25,000, which represents the railway's capitalization. Reference to the new ownership of the property was made in the ELECTRIC RAILWAY JOURNAL, issue of May 29, 1926, page 948.

South Shore Line Petitions for Equipment Certificate Approval.—Approval of an issue of equipment trust certificates in the principal amount of $1,060,000 as part of the plan of financing the purchase of 43 new cars and locomotives has been asked in a petition filed with the Indiana Public Service Commission by the Chicago, South Shore & South Bend Railroad, Michigan City, Ind. The equipment, which was ordered last year at a cost of $1,333,787, consists of two dining cars, two parlor cars, 35 electric motor cars for passenger and baggage service and four 80-ton Westinghouse electric locomotives.

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Personal Items

J. K. Buchanan Resigns

J. K. Buchanan, vice-president and general manager of the West Virginia Utilities Company and the Wheeling Public Service Company, of Morgantown and Wheeling, W. Va., resigned recently. The resignation was announced from the office of the Southern Cities Utilities Company, parent organization.

Mr. Buchanan has been identified with the Wheeling concern since April, 1904, when he entered the employ of the Union Utilities Company, then directed by Harry Warfield as executive officer. The Union Utilities Company then became the West Virginia Traction & Electric Company, at which time its ownership passed into the hands of Eastern interests. During the war-time period there was a receivership, but this was lifted on April 1, 1920, and the property, along with that of Wheeling, was purchased in 1921 by Anderson & Company, Providence, R. I. Mr. Buchanan rose steadily in the ranks until he reached the position of general superintendent, which he held up to 1925, when he was elected vice-president and general manager. The Morgantown properties of the West Virginia Utilities Company are conservatively valued at $4,000,000. The Wheeling properties are estimated at $3,000,000.

Northern Ohio Changes Announced

Howard L. Farmer, veteran trainman in the employ of the Northern Ohio Power & Light Company, has been made superintendent of the Canton and Massillon city divisions and of the interurban division south of Akron. He succeeds Frank J. Conklin, who has held the position for the last seven years. Mr. Conklin goes into the freight department.

Charles Stottler, who has had charge of the Massillon shops for ten years, has resigned. He is succeeded by Harry Bucher, formerly of the Dover shops of the company.

W. A. Carlisle has been put in charge of a branch office in New York City of the Georgia Railway & Power Company, Atlanta, Ga., organized as part of the campaign to bring new industries to Georgia. Mr. Carlisle is personally familiar with conditions of interest to industrialists in the section served by the company. In addition to distributing literature and answering inquiries at the Eastern headquarters, Mr. Carlisle is personally calling on executives of various industries in the East in an effort to attract more factories to Georgia.

J. R. Dew has been made division passenger and freight agent of the Union Traction Company of Indiana in the territory comprising the cities of Marion, Kokomo, Logansport, Peru, Wabash, Tipton, Elwood and Noblesville, with his headquarters at Kokomo. The appointment is in line with the company's policy to provide service and counsel to all shippers and travelers who desire it. With the rapid extension of the first, second and third morning deliveries to points in Indiana, Ohio and Michigan and the addition of bus service to interurban passenger service the need has become acute for intensifying the various contacts maintained between the company and the public.

C. C. Gillette Promoted

C. C. Gillette, research manager of the Pittsburgh Railways, Pittsburgh, Pa., has been named vice-president and general manager in charge of operation of the Wheeling Public Service Company, Wheeling, W. Va. This announcement, emanating from the office of the Southern Cities Utilities Company, parent organization. Mr. Gillette succeeds J. K. Buchanan. He has already assumed charge of the Wheeling properties.

C. C. Gillette

Mr. Gillette has been identified with the Pittsburgh property since September, 1921, when he became a special investigator for the Pittsburgh Railways. He was made traffic agent in the commercial department in 1923 and held this position up to the time of his appointment as research manager in 1925. Before his affiliation with the Pittsburgh Railways Mr. Gillette was associated with the Westinghouse Electric & Manufacturing Company. With that company he took the graduate students' apprentice course and special engineering course under B. G. Lamme. He also worked one year in the railway project section of the general engineering department. In May, 1917, he entered the military service and was connected with the Fourth Infantry, Third Division, as a first lieutenant and captain from September, 1917, to December, 1919. Mr. Gillette is a graduate of Bucknell University with the degree of electrical engineer. He was born in Rochester, N. Y., in 1895.

The new vice-president had the honor of being one of the four especially resourceful young men who were appointed to posts at the time of the creation of a commercial department on the Pittsburgh Railways, following the reorganization of that property. Mr. Gillette as traffic agent, J. E. Davis as special investigator, F. R. Cogswell as director of traffic promotion and J. B. Donnelly as director of public relations were all chosen to have a hand in the destiny of the newly-resurrected property because of their technical training and because temperamentally they were considered fitting overseers of such assignments.

George D. Wilcox, automotive engineer of the Department of Street Railways at Detroit, Mich., has resigned, effective July 3. Mr. Wilcox was engaged in work in connection with mechanical developments in the automotive department of the municipal system. The type of bus which the Street Railway Department recently contracted to purchase was designed by Mr. Wilcox and the specifications were drawn under his direction.

Clarence M. Lewis has been appointed counsel to the New York Transit Commission, effective July 1, to succeed General Louis W. Stotesbury, resigned. The salary is $15,000. The appointment of Mr. Lewis was announced by John F. Gilchrist, chairman of the commission. The new counsel was educated in the public schools of New York, at the College of the City of New York and the New York Law School. He was admitted to the bar in 1903.

W. T. Young, general manager of the Dundee Corporation Tramways of Scotland, has been appointed general manager of the Halifax Corporation Tramways of England. In this capacity he succeeds B. Hall, who has been appointed to a similar position in Portsmouth. During the past 27 years Mr. Young has held important posts in a number of British municipal tramway undertakings.

George A. Prichard, an attorney for many years in the train service of the Los Angeles Railway, Los Angeles, Cal., has been designated special legal adviser for employees requiring such service. Except when trials in court are necessary this advice and service, like preparing papers, such as deeds, mortgages and contracts, will be given without charge to employees. In matters involving purely domestic affairs and relations with the police traffic department, such as traffic violations, employees of the transportation department may continue to call upon that department, which will assign the cases to the special counsel if it be found advisable or necessary to do so.

Oakley Baskin has been appointed superintendent of power and lines of the International Railway, Buffalo, N. Y., according to announcement made by Bernard J. Yungbluth, president of the company. In this capacity he succeeds Joseph Mack. Mr. Baskin became affiliated with the International Railway in 1911 as assistant electrical engineer. He formerly was with the Flint Electrical Company as manager and also has been associated with the Astoria Electrical & Power Company,

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Astoria, and the departments of maintenance and testing of the General Electric Company, Schenectady. He is a graduate of Pratt Institute.

Obituary

John E. Duffy

John E. Duffy, general superintendent of the New York State Railways in Syracuse, Utica and Oneida, died at his home in Syracuse at the age of 65. His death followed a long illness. He had not been at his office since February.

Mr. Duffy was one of the best-known railway men in the East. He had been connected with the New York State Railways for the last 33 years.

He was born at Herkimer, and went to Syracuse with his parents in 1873. He was educated in the public schools and in 1879 began work as an apprentice in a shoe factory. He stayed at that trade for fourteen years. He was appointed a conductor on the Syracuse Consolidated Railway in 1893. At that time there were several competing lines in Syracuse. In 1896 he was made an inspector, and a year later was appointed night foreman

John E. Duffy

at the Tallman Street shops of the People's Line.

In 1898 he became inspector again and in 1899 was made day foreman. In June, 1900, he became chief inspector of all lines of the newly consolidated companies. The following October he was placed in charge of the transportation department and a year later was appointed superintendent of the Syracuse lines, New York State Railways.

Eleven years later he was promoted to the general superintendency of the Syracuse, Utica and Oneida lines.

Bernord D. Booker, an attorney in the legal department of the Philadelphia Rapid Transit Company, Philadelphia, Pa., died recently in the Casualty Hospital, Washington, following an automobile acident in Riverdale, Md. Mr. Booker was graduated from the University of Virginia in 1919 and afterward was admitted to the Pennsylvania bar. He became associated with the Philadelphia Rapid Transit Company in 1922. He was 31 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Cars in Outdoor Space

Comprehensive Street Car Exhibit Planned for Cleveland, Exemplifying Every Modern Type for All Kinds of Service

Extraordinary facilities are to be provided at Cleveland for cheaply and conveniently exhibiting street cars. This will permit probably the most gigantic and spectacular street car display ever held in the world. These facilities will be available as a result of arrangements made with the Cleveland Railway and the official drayman for handling cars received from the steam railways and the interurban railway track connections.

John J. Stanley, president of the Cleveland Railway, has addressed a communication to railway operators and manufacturers asking that 100 cars be displayed. The manufacturers will exhibit the latest cars, both city and interurban, which they are building today. The operators will exhibit cars now running which represent the developments of the last few years. It is expected that there will be a complete display of every modern type of city and interurban car, with all the variations in car body design, trucks and accessory equipment to meet varying service requirements. This one feature alone of the exhibit will be well worth careful study by railway men. To the public at large it will afford a convincing demonstration of the way in which electric railways are meeting changed conditions in the transportation field and serve as proof that as a vehicle for rapid, safe and comfortable transportation service the modern electric street car cannot be surpassed.

If the committee's plans are successful, one of the association's newly designed standard cars developed during the year by the special manufacturers' committee and built by one of the member companies will be on view. Among other exhibits, it is hoped that there will be one of the new streamline body cars. This car will illustrate the results of efforts to enhance the architectural grace and proportions in body design. In addition there will be standard one-man cars, double-truck one-man, two-man cars of the center entrance and exit type, cars for heavy rush-hour traffic and lighter cars for supplemental service; in other words, big cars and little cars, for various kinds of city service. In the interurban field exhibits of recent designs in heavy Pullman type cars intended for operation at 75 to 80 m.p.h. are being planned. Contrasting with these will be the light-weight simplified types for speeds up to 50 m.p.h., and still further, the lighter weight one-man type of interurban car; special interurban cars, including the latest developments in interurban sleepers, and dining cars.

In the work car class, all types of dump cars, crane cars and other types of work cars will be exhibited.

Closely allied with the car exhibit will be a display of heavy track machinery and tools. Among these, the committee plans to secure sweepers, snow plows, concrete breakers, car wheel trucks and tractor devices, track digging plows, earth borers, tie tampers and other maintenance of way tools. The facilities to be provided at the convention will permit many of these to be put in actual operation so that their effectiveness can be demonstrated.

To date association headquarters has received requests from 144 exhibitors for 68,693 sq.ft. of space, not including track space, for which applications have been received for more than 500 linear feet.

Twin City Company Is Testing Gas-Electric Buses

Tests of two makes of gas-electric buses are being conducted by the Twin City Rapid Transit Company, Minneapolis, Minn., and the Northland Transportation Company, bus subsidiary of the Great Northern Railroad. These buses, furnished by the International Motor Company and the Yellow Truck & Coach Manufacturing Company, are said to be practically noiseless in operation and are equipped with electric brakes for hill braking and emergency stops. It is planned by the Twin City Rapid Transit Company to operate gas-electric buses on its proposed Nicollet-Hennepin bus line in Minneapolis. T. Julian McGill, vice-president of the company, said:

> The new type of gasoline-electric bus is as noiseless as possible, and that is of great importance when operating bus service through the residential districts. This type is particularly desirable for service on Nicollet Avenue. Actual bus operation probably will begin in September of this year.

Much Interest Shown in Gas-Electric Rail Cars

Four additional railroads have recently ordered gas-electric rail cars from the J. G. Brill and Westinghouse Electric & Manufacturing companies. The contracts as placed by the respective roads include four 71-ft. combination baggage and passenger cars for the Lehigh Valley, two standard 60-ft. cars for the Central of Vermont, two standard 60-ft. cars for the Pennsylvania Railroad and four 60-ft. cars for the St. Louis & San Francisco. The first named four cars, however, instead of the standard 250-hp. gas-electric generator units, will be equipped with double units giving each car a total of 500 hp. This will make them the heaviest engined passenger gas-electric cars ever built anywhere in the world.

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American Car Earnings Hold Steady

President Woodin Reviews Affairs in Annual Report and Discusses Entrance Into Bus Building Field

Lament is expressed by W. H. Woodin, president of the American Car & Foundry Company, New York, at the volume of new equipment buying by the railroads during the fiscal year of that company ended June 30, 1926. Such buying was not in the volume that reasonably might have been expected. Export business was good; in fact, much better than the year before, and in the manufacture and sale of miscellaneous products the company did a business satisfactory both as to quantity and profit. The year closed with a fair amount of business booked, and he sees no reason to complain with respect to the share of business obtained by the company.

Net earnings of the company and its subsidiaries in the fiscal year ended April 30, 1926, were $6,102,898, equivalent, after preferred dividends, to $6.67 a share on 600,000 shares of common stock. This compares with $6,164,104, or $6.77 a share, in the preceding twelve months.

Total earnings in the last fiscal year were $9,274,572. After allowing $3,171,674 for renewals, replacements, etc., dividends of $2,100,000 on 7 per cent preferred stock and $3,600,000 dividends on common stock, a surplus of $402,898 is shown. This brings the consolidated surplus as of April 30, 1926, up to $41,245,296.

Of particular interest to readers of the ELECTRIC RAILWAY JOURNAL are the remarks by Mr. Woodin about the entrance of the company into the bus, truck and electric railway fields. He says that the management for some time past has been giving careful study to the problems in transportation both of passengers and of freight presented by the growing use by the electric and steam railroads of automotive vehicles, including buses, motor trucks and motor-driven rail cars—vehicles which have demonstrated their value in service supplementary to that of many street and interurban electric railways and for use by branch lines of steam railways where under present day costs the available traffic has not been sufficient to permit of profitable operation by the older methods. As Mr. Woodin sees it, these vehicles unquestionably will play an increasingly important part as factors in the improvement of the railway earnings.

Recognizing these conditions, the management concluded some time ago that in the manufacture and marketing of such automotive equipment there lay a legitimate and profitable field for an extension of the company's activities and during the year just closed it entered that field by the organization of American Car & Foundry Motors Company and the acquisition of a controlling interest in the newly organized Brill Corporation.

In commenting on the general conditions Mr. Woodin said in part:

> The railroad buying of new equipment during the year has been done spasmodically and at prices that have made a profit possible only by keeping costs to a minimum, this calling for the practice of the utmost economy and efficiency in all departments of the company's activities.
>
> The railroads generally are in good financial condition. There is hanging over them no threat of legislation adversely affecting their interests. Undoubtedly there is need of additional equipment if they are to discharge adequately their functions as carriers of the products of the country's industry. These conditions justify the expectation of increased buying activity, and when that comes there is no reason to doubt that the company will get its fair share of the business.
>
> There has been a very noticeable and progressive lessening of the volume of business done in the rebuilding and repairing of old equipment. This is due in part to a more or less insistent demand that the railroads should in their own shops rebuild and repair their worn equipment. Such demand is not justified on the score of cost.

The consolidated income account compares:

	1926	1925
Earnings	$9,274,572	$9,781,085
Renewal and replacement*	3,171,675	3,616,982
Net income	$6,102,897	$6,164,103
Preferred dividends	2,100,000	2,100,000
Common dividends	3,600,000	3,600,000
Surplus	$402,897	$464,103
Previous surplus	40,842,399	37,278,466
Profit and loss surplus	$41,245,296	$37,742,569

*Repairs, new patents, flasks, etc.

Ten New Cars Ordered by Suburban Road

New York, Westchester & Boston Railway, New York, N. Y., has ordered ten additional electrically equipped passenger cars. The new units will be built by the Pressed Steel Car Company, Pittsburgh, Pa., and the electrical equipment supplied by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Installation of the electrical equipment will be made at the Harlem shops of the New York, Westchester & Boston Railway.

The cars will cost approximately $450,000 and are being provided to accommodate a rapidly increasing burden of traffic which during the first five months of 1926 has gained nearly 14 per cent over a similar period in 1925, and promises to reach a total of 11,500,000 for the current year, according to Leverett S. Miller, president of the road. The cars will be 72 ft. in length, weigh 66 tons, and seat 80 passengers. Each car will have the "dead man control" feature. Two 340-hp. motors are provided per car and the overhead pantograph feeder system will be used for current collection. The six entrances of each car will be of electro-pneumatic operation. The ventilating system will be of the Garland high-speed vacuum type.

Inasmuch as the New York, Westchester & Boston passenger schedule was recently revised to provide twenty additional trains daily, making a total of 245, there will be no immediate further addition. The new cars will be used in lengthening trains already scheduled, according to Mr. Miller. He indicated that further orders for passenger car equipment might become necessary by fall of this year, when an extension from Mamaroneck to Harrison, N. Y., now under construction is to be completed.

Metal, Coal and Material Prices

Metals—New York	June 22, 1926
Copper, electrolytic, cents per lb	13.95
Copper wire, cents per lb	16.00
Lead, cents per lb	8.25
Zinc, cents per lb	7.46
Tin, Straits, cents per lb	61.50
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.925
Pittsburgh mine run, Pittsburgh, net tons	1.75
Franklin, Ill., screenings, Chicago, net tons	1.80
Central, Ill., screenings, Chicago, net tons	1.575
Kansas screenings, Kansas City, net tons	2.425
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.	11.70
White lead in oil (100-lb. keg), N. Y., cents per lb	15.00
Turpentine (bbl. lots), N. Y., per gal	$0.89

Italian Engineers Study American Railroad Electrification

Following the meetings of the International Electrotechnical Commission, a commission consisting of several engineers from the Italian State Railways who are interested in railroad electrification availed themselves of the opportunity to study American electrified systems. Included were Oresti Jacobini, manager of electrification in Italy; Guiseppe Bianchi, in charge of electric locomotive investigations; Enea Virgili, in charge of overhead transmission and substations; Gino Minucciani, in charge of operation investigations, and Eugenio Dupré of the electrification office in Rome. Accompanying them were Ugo Ferella of the Compagnia Generale di Elettricita of Milan, Italy, and J. J. Linebaugh of the railway engineering department of the General Electric Company.

Among the electrified railroads inspected were the Chicago, Milwaukee & St. Paul and the Butte, Anaconda & Pacific Railway. In addition, Mr. Bianchi spent three days inspecting the shops and test tracks of the General Electric Company at Erie, Pa., where most of this company's railway apparatus is built and tested. Several types of locomotives were being assembled at the time, including oil-electrics, the new motor-generator type for the New York, New Haven & Hartford and the New York Central gearless passenger locomotives.

In addition, the commission visited the Schenectady plant of the General Electric Company. F. C. Pratt, vice-president of the General Electric Company in charge of engineering and manufacturing; G. Faccioli, works engineer of the company at Pittsfield, Mass., and Mr. Jacobini of the commission were speakers at a dinner in Schenectady given by the International General Electric Company in honor of the visitors.

Bus Exports in 1925 Showed Big Increase

Exports of 58,624 automobile trucks and buses, valued at $37,703,302, were made from the United States in 1925, as compared with 27,332 units, valued at $19,199,344, in the preceding year. This showed an increase of more than

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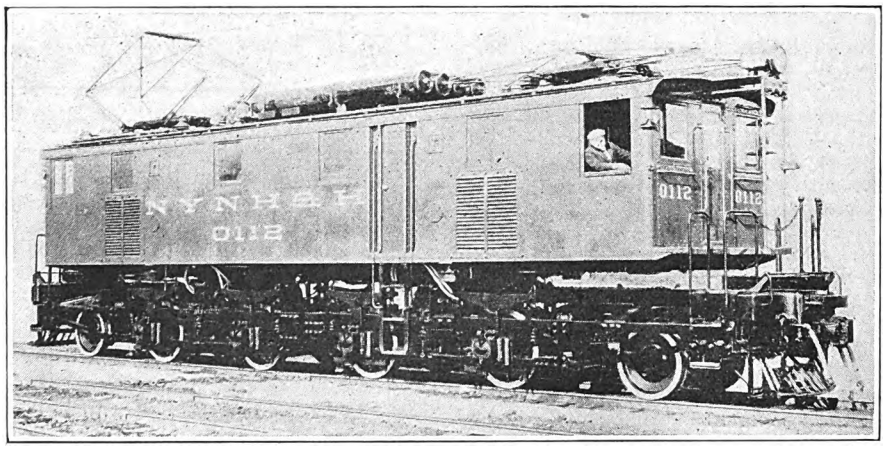
100 per cent, while the domestic production increased by only 32 per cent, from 360,625 in 1924 to 475,941 in 1925, according to the Automotive Division of the Department of Commerce.

New Haven to Receive Newest Type of Electric Locomotive

The first of the new type electric locomotives for the New York, New Haven & Hartford Railroad has been shipped from the Erie Works of the General Electric Company. The locomotive is one which combines the economic advantages of both alternating and direct current—alternating current for transmission and distribution and direct current for operation of the traction motors. Power is received from a single-phase trolley and reduced from 11,000 volts and 25 cycles to direct current at 600 volts.

The new type locomotive is a joint product of the American Locomotive and General Electric Companies. The New York, New Haven & Hartford Railroad is obtaining seven of them, five for freight service on the main line between Oak Point and New Haven and two for switching purposes in general yard service. When double-heading, these locomotives will function in multiple with the present single-phase locomotives. A preliminary description of these locomotives was published in the ELECTRIC RAILWAY JOURNAL, issue of Oct. 18, 1924, page 705. The present units differ from this description only in the matters of over-all length, which is 53 ft. 2 in., and rigid wheelbase, which is 8 ft. 3 in.



New Haven Has Placed Newest Electric Locomotive in Service

Yellow Truck Earnings for Second Quarter May Break Record

Net earnings of the Yellow Truck & Coach Manufacturing Company, Chicago, Ill., for the quarter ended March 31, 1926, were $209,966 in excess of dividend requirements, according to a statement issued on June 14 by John A. Richey, president. Net profits available for dividends amounted to $580,466. The showing made during April and May, together with orders on the books for June, indicates the second quarter will be the greatest in the company's history.

Francis Hodgkinson and A. D. Hunt Honored

Slightly more than a year after he was awarded the Elliot Cresson Gold Medal by the Franklin Institute in recognition of his scientific achievements, Francis Hodgkinson, for many years chief engineer of the South Philadelphia Works, Westinghouse Electric & Manufacturing Company, was appointed consulting mechanical engineer for the organization as a whole, taking effect on June 7. Simultaneously an order discontinuing the position of chief engineer of the South Philadelphia Works and creating instead the position of manager of engineering was announced. Appointed to the new position is A. D. Hunt, well known in engineering circles and for many years a member of the engineering staffs of the Westinghouse organization.

Mr. Hodgkinson's prime duty will be to act as consulting engineer in all design problems and other engineering activities at South Philadelphia. During his noteworthy career he was associated with the Chilean Navy, the telephone company and electric light company at Lima, Peru, and C. A. Parsons & Company, the famous turbine designers and builders. When, in 1896, the Westinghouse Machine Company acquired the American rights for the manufacture of the Parsons type turbines, Mr. Hodgkinson, upon the recommendation of Sir Charles Parsons, became connected with the Westinghouse Machine Company, which subsequently became the turbine building section of the Westinghouse Electric & Manufacturing Company.

In 1916 he was made chief engineer of the South Philadelphia Works, being advanced to his present position exactly ten years later.

A. D. Hunt, the new manager of engineering, has been connected with the Westinghouse company for a number of years, occupying the position of manager of steam service at the South Philadelphia Works. Mr. Hunt was graduated from Cornell University in 1905 with the degree of mechanical engineer. Later the same year, he joined Westinghouse, Church, Kerr & Company in an engineering capacity, and eventually joined the Westinghouse Electric & Manufacturing Company, being assigned to the South Philadelphia Works in September, 1919, in the marine service section. He remained in that capacity until Jan. 1, 1920, when he was appointed manager of steam service. He was born in Tarrytown, N. Y.

Buses Ordered in Seattle—Cars Will Be Purchased Soon

It would appear that the long-deferred action in the matter of buses and street cars for the Municipal Street Railway, Seattle, Wash., is at last coming to a head. The city purchasing agent has issued an official call for bids on 80 light-weight street cars of the front-entrance, center-exit type, with a seating capacity of 58 passengers. In addition to this action, the City Council recently passed an ordinance appropriating $75,600 to purchase fourteen new buses for use on the Tenth Avenue Northeast Line to replace the privately-owned buses that are now operating.

The ordinance provided that five 21-passenger buses and two chassis will be bought from the Garford Motor Truck Company, two chassis from the White Company, and five Reo buses from the Lamping-McDonald Motor Company. For more than a year the City Council has been trying to reach an agreement as to what type of buses should be bought for this service. The bus manufacturers will take railway department warrants at par in payment.

Rolling Stock

San Francisco, Cal.—The Board of Public Works has been authorized to furnish and deliver fifteen street cars for the municipal railroad. The board is also authorized to approve plans and specifications for these cars.

Des Moines & Central Iowa Railway through its bus operating subsidiary, the Des Moines & Central Iowa Motor Transportation Company, has entered the field of bus operation with three Mack parlor car units, and is now operating an interurban service between Des Moines and Newton, Iowa, a distance of 30 miles. The three new units are equipped with Lang parlor car bodies mounted on Mack 230½-in. bus chassis.

Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, is rebuilding fifteen center-entrance steel cars for use on the city lines in the East Liverpool and Steubenville districts, it was recently announced by C. S. Wills, general superintendent. The first of these cars has just been completed and is now in service. Among the improvements being made on the equipment are the addition of electric heating coils, double thickness flooring, and a new steel inner lining. The trucks have been rebuilt and extensive renewals made in the air brake equipment.

Municipal Railway of St. Petersburg, St. Petersburg, Fla., recently received eight X-21 city service buses from the Yellow Truck & Coach Manufacturing Company, Chicago, Ill. With these units bus operation was inaugurated by the St. Petersburg company, and on

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June 4 hundreds of residents of the town accepted the invitation of Mayor Blanc for a free ride through the suburban part of the community. Beginning on June 8 five of the buses were placed in operation on the north side loop through Granada Terrace and Fourth Street. Two buses are providing service to the south side residents on Fourth Street South and Lakeview Avenue, while the eighth bus is being held in reserve.

Track and Line

New York, N. Y. — The Board of Transportation recently received seven bids for completing the Times Square station of the Queensboro subway extension, now under construction under 41st Street from the Fifth Avenue station at Bryant Park to Eighth Avenue. The informal totals of the bids were: M. F. Kelly Building Company, $179,708; Ascher Engineering Company, $180,357; Norman A. Desier, $197,000; John B. Roberts & Company, $199,000; D. C. Serber, Inc., $202,252; Werner-Mitchell Company, $205,000; Joseph Colon Construction Company, $218,809.

Chicago & West Towns Railway, Chicago, Ill., is rapidly pushing the reconstruction of its line on 52d Avenue, Cicero, between Roosevelt Road and 22d Street. New rails and ties are being laid and close to 1 mile of second track added. Grooved, city type rails will replace the former T-rail construction. The city of Cicero has announced its intention of completing the paving of that portion of the street which the company is not required to pave.

Minneapolis, Northfield & Southern Railway, Minneapolis, Minn., which operates gas-electric passenger trains and steam freight, will spend $1,500,000 in extension work, including 6 miles to connect with the Minneapolis, St. Paul & Sault Ste. Marie road between Golden Valley and Crystal. This will give that line direct connection with every steam road entering the city.

Power Houses, Shops and Buildings

Columbus Electric & Power Company, Columbus, Ga., has received a permit for the enlargement and remodeling of the carhouse at Seventeenth Street and Second Avenue. The cost of the work will be approximately $6,000.

Wisconsin Gas & Electric Company, Kenosha, Wis., has completed work on the construction of its new garage, costing approximately 80,000, which will provide more adequate facilities for its rapidly growing bus business.

Trade Notes

Trico Fuse Manufacturing Company, Milwaukee, Wis., has recently appointed J. T. Sudduth & Company, 229 Brown-Marx Building, Birmingham, Ala., as sales representatives for the states of Alabama and Georgia. F. J. Keller & Company, Fort Worth, are sales representatives for the state of Texas. The Coast Electric Supply Company, 222 South San Pedro Street, Los Angeles, is a new Trico sales representative for the state of California.

Botsfield Refractories Company, Philadelphia, Pa., manufacturer of Adamant fire brick, cement and refractory furnace lining, announces that the Standard Asbestos & Cork Company has been appointed distributor of Adamant fire brick cement in Tulsa, Okla.

Charles B. Phelps, Paterson, N. J., announces that he and Charles J. Schmid, his associate, have been appointed metropolitan New York and northern New Jersey representatives for the Uehling Instrument Company of Paterson, the Williams Gage Company of Pittsburgh, the Combustion Control Division of A. W. Cash Company of Decatur, Ill., and the National Boiler Protector Company of Dayton, Ohio. Mr. Phelps still retains his former connection with the Uehling company as treasurer. Mr. Schmid was formerly the Boston representative of the Uehling Instrument Company.

Sullivan Machinery Company, Chicago, Ill., announces the appointment of Charles B. Officer, hitherto assistant to the president on engineering matters, to the position of chief engineer of the company, in charge of engineering matters with regard to new machinery or changes in existing designs. Mr. Officer is a graduate of Yale University, from which he received his Bachelor of Science degree from Sheffield School in 1912 and his M.E. degree in 1915. He has been connected with the Sullivan company ever since his graduation.

Cecil R. Lambert Company, Inc., Detroit, Mich., specialists in the design, manufacture and installation of conveying and handling equipment, announces that in order to identify its products and service with its name, it has changed its name to Mechanical Handling Systems, Inc. The company's facilities for service are being increased by additions to its plant and personnel, but there is no change in ownership, management or executive staff.

The Burr Company, Champaign, Ill., sold its plant and other physical equipment at a master's sale to D. C. Dobbins and Mrs. E. B. Rothgeb, daughter of Ellis Burr, founder of the company, for $27,200. Patent rights and drawings on the dynamometer car, manufactured by the company, were taken by the Baldwin Locomotive Company for $15,000. This company will pay about 50 cents on the dollar to its creditors, it is reported.

A. Milton Buck has joined the sales force of the Bridgeport Brass Company, Bridgeport, Conn. Mr. Buck will have his headquarters in Washington, covering Washington, D. C., and the states of Maryland, Virginia and West Virginia. He will specialize on sales of Bridgeport-Keating flush valves and Plumrite brass pipe.

Chemical & Vacuum Machinery Company, Inc., Buffalo, N. Y., has acquired from the Judelson Evapo-Dryer Corporation, New York, N. Y., all rights to build and market exclusively the apparatus known as the Judelson Evapo-Dryer under process patent 1,527,193, dryer patent 1,527,192, and insulator patent 1,513,595.

Roller-Smith Company, New York, N. Y., announces that the states of Maryland, Virginia and North Carolina are now covered by C. R. Speaker, Evening Star Building, Washington, D. C. The former arrangement with W. A. McCombs & Company, Westinghouse Building, Pittsburgh, Pa., has been transferred to a newly-formed organization, the D.-B. Sales Engineering Company at the same address. The Tennessee Engineering & Sales Company, Knoxville, Tenn., has added to its territory the states of Georgia, Florida and South Carolina, which, together with eastern Tennessee, form the section in which it represents the Roller-Smith company.

Leon L. Wolf Waterproof Fabric Company, Cincinnati, distributor of Kemi-Suede, the waterproof material for roofs, upholstering, flooring and curtains, has elected B. A. Colker secretary. He succeeds Leon Lederer, who remains a member of the board. Mr. Colker has been associated with the company as sales manager and assistant to Leon L. Wolf, president, for some time.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued a novel folder which graphically illustrates the manner in which traffic conditions have increased in the past 30 years and suggests the use of Crouse-Hinds traffic signal installations to meet the present situation. On the inside of the folder is pictured a large map of the United States showing the cities where these traffic installations have been made.

The Alexander Milburn Company, Baltimore, Md., has issued a miniature catalog illustrating quite comprehensively the complete line of Milburn welding and cutting equipment. Copies of this booklet may be obtained from the company upon request.

Duff Manufacturing Company, Pittsburgh, Pa., has issued a new leaflet on the Duff pinion puller. This device has been developed in conjunction with the engineers of the Westinghouse Electric & Manufacturing Company particularly for use in repair shops and power houses. The manufacturer describes the Duff pinion puller as "the simplest, quickest and most positive tool ever developed for its purpose."

Spicer Manufacturing Corporation, South Plainfield, N. J., has issued bulletin No. 44, giving price lists on genuine Spicer parts for type G grease-lubricated joints. Information is also contained in the bulletin on correct lubrication of Spicer universal, together with suggestions for removing, repairing and assembling type G universal joints and propeller shafts.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has released the first of a series of railway maintenance charts believed to be very interesting and helpful to maintenance men. The intention of the company is to get out these charts regularly. The first chart of the series covers armature and axle bearings. The second, to be released in about a month, will have for its subject armature insulation.

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Vol. 67
No. 26

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1083-1132

JUNE 26, 1926

CONTENTS

Editorials 1083

New Light-Weight Equipment Pays! 1086

A.E.R.A. committee on essential features of modern cars submits designs for city and interurban cars. Elimination of needless variations in design urged. Results with new cars on a number of properties show big return on the investment.

Public Safety Demonstrated in El Paso 1098

Houston's Talking Cars Remodeled from Old Equipment 1098

BY F. J. BENNETT.

Many innovations introduced to attract the attention of the car rider. Air-operated electric signs used effectively.

Washing the Brooklyn Tunnels 1099

Tri-City Trainmen Sign After Reading Bulletins .. 1100

Railway Aids Safety Drive at Joliet 1100

One Owner's Faith in the Trolley—I 1101

After others lost hope, C. A. Smith made "Stream Line" interurban successful. Straighter track, higher speed, greater safety and more attractive cars have helped bring about the improvement.

Improved Training for Platform Men Used on Third Avenue System 1105

BY DR. CHRISTIAN P. SEGARD.

Emphasis is laid on methods of instruction as against selective work. Formation of correct habits used as the foundation of the training school effort. Apparatus in the schoolroom is of simple but effective character.

A Whole Convention Moved by Interurban 1108

BY J. A. ROWE.

Improvement Made in Rolling Stock of British Tramways 1109

More than 550 new cars included in recent orders. Much reconstruction has been done to promote passenger comfort. Modernization of motors has resulted in greater speed.

The Readers' Forum 1113

A Good Selling Job on a Single Page Circular 1113

Maintenance Notes 1114

American Association News 1117

News of the Industry 1118

Recent Bus Developments 1124

Financial and Corporate 1125

Personal Mention 1128

Manufactures and the Markets 1129

Facts First—

The Duty of the JOURNAL

NOT long ago a railway manager remarked that the publication of deficits was not an encouraging note to sound in the pages of the leading magazine of the industry. While this is true it has nevertheless been this very policy of publishing facts, good or bad, that has made possible such leadership.

Success of the JOURNAL depends as much on the success of the industry as any other affiliated agency, and a deficit is no more glad tidings to its staff than to the railway board of directors to which such a report may be addressed. To hide the results or camouflage the facts would be not only bad publishing, but as futile as the habit of the ostrich, which hides his head in the sand to avoid his enemies.

The JOURNAL has faith in the industry and faith in the ability of its personnel to build bigger and better the structures of its art. The deficits of today, like the mistakes of yesterday, will be but landmarks to guide the progress of tomorrow. The truth is essential and cannot be avoided.

McGRAW-HILL PUBLISHING COMPANY, INC.

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(Published in London)

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Change of Address—When change of address is ordered the new and the old address must be given, notice to be received at least ten days before the change takes place.

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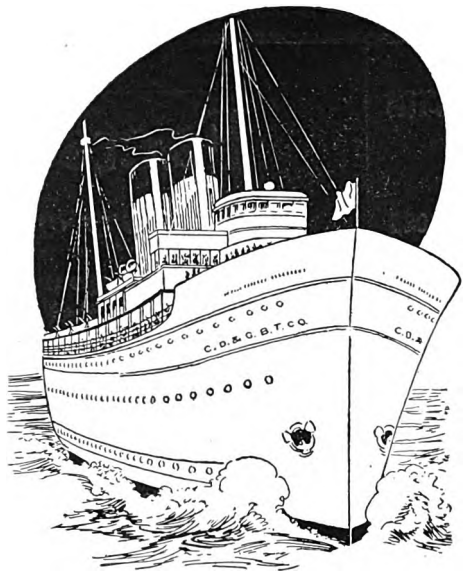

C.E.R.A.—Ahoy!

Aboard the "South American",
On Erie, Huron, Michigan,
Good railway men can learn a lot
About more riders—how they're got.

A glassy sea fine riding makes,
But bumping wave no pleasure wakes.
Exactly so with cars on rail—
The best of cars on rough track fail.

Railway Track-work Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
H. F. McDermott, 208 S. LaSalle St., Chicago
P. W. Wood Railway Supply Co., New Orleans, La.
Equipment & Engineering Co., London
Frazar & Co., Japan

1199

SAVING THE RAIL SAVES THE RAILWAY

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How do you Measure Ear Service?

Here is Shown What One Road Gained by Using Marathon Ears

1. Life of Ears: 24 months for Marathons vs 6 to 8 months for others.
2. Savings in Dollars: Estimated at $5,000 a year since using Marathon Ears.
3. Reduction of Trolley Breaks: Average of 73 breaks per year before installing Marathons vs 30 since.
4. Reduction in Ear Replacements: 1923, 1470 per month; 1924, 1009 per month; 1925, 50 per month.
5. Life of Trolley Wire: 15% increase is estimated.
6. Wear of Wire Directly Under Ears: None since using Marathons.

These figures were furnished by the Electrical Engineer of a large city property and are actual performance records. Facts such as these show that O-B Marathon Ears do insure substantial, worth-while savings. And they give you a new standard by which to measure trolley ear service.

This is but similar to the records of these modern ears on many properties. All of them show substantial economies. It will pay you to specify Marathons on your next order.

Ohio Brass Company, Mansfield, O.
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada

80B

Ohio Brass Co.

PORCELAIN INSULATORS · LINE MATERIALS · RAIL BONDS · CAR EQUIPMENT · MINING MATERIALS · VALVES

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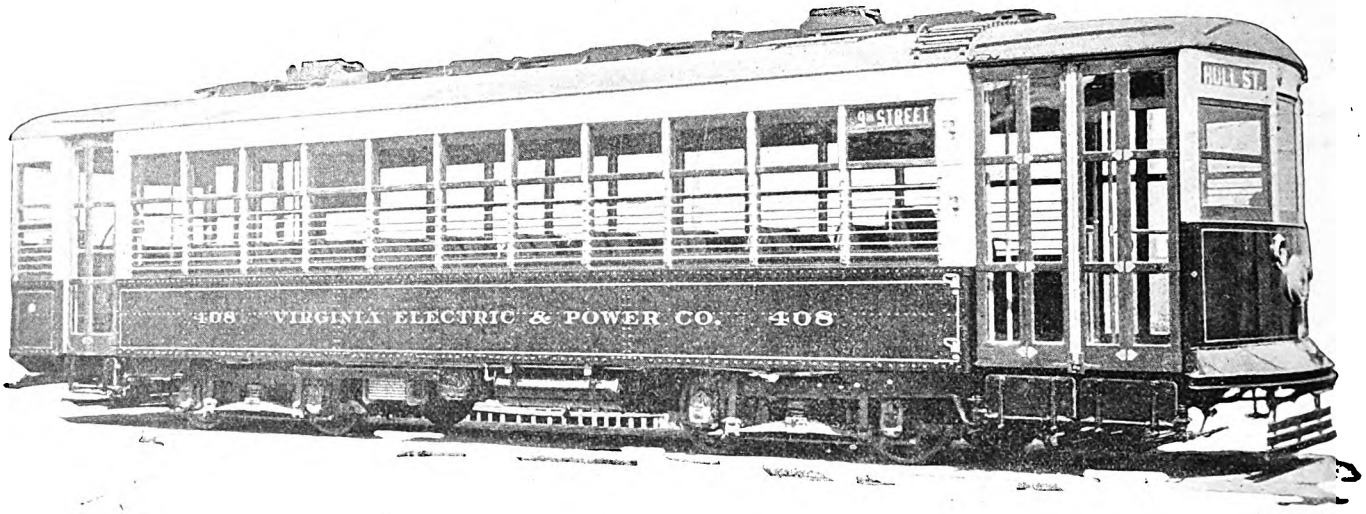

A new user of Variable Load Brakes

The *Virginia Railway and Power Company* has recently put into service 15 new cars equipped with Westinghouse Variable Load Brakes.

This is one of the many traction companies that have recognized the auspicious part that Variable Load Brakes can play in the operation of modern light weight surface cars.

Variable Load Brakes provide for the same effectiveness of retardation throughout the entire range of car loading, thus assuring uniformly short stops which are reflected in greater safety and increased schedule speeds.

Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office—*Ask for Descriptive Catalogue T-2045.*

WESTINGHOUSE TRACTION BRAKE CO.
General Office and Works: WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES

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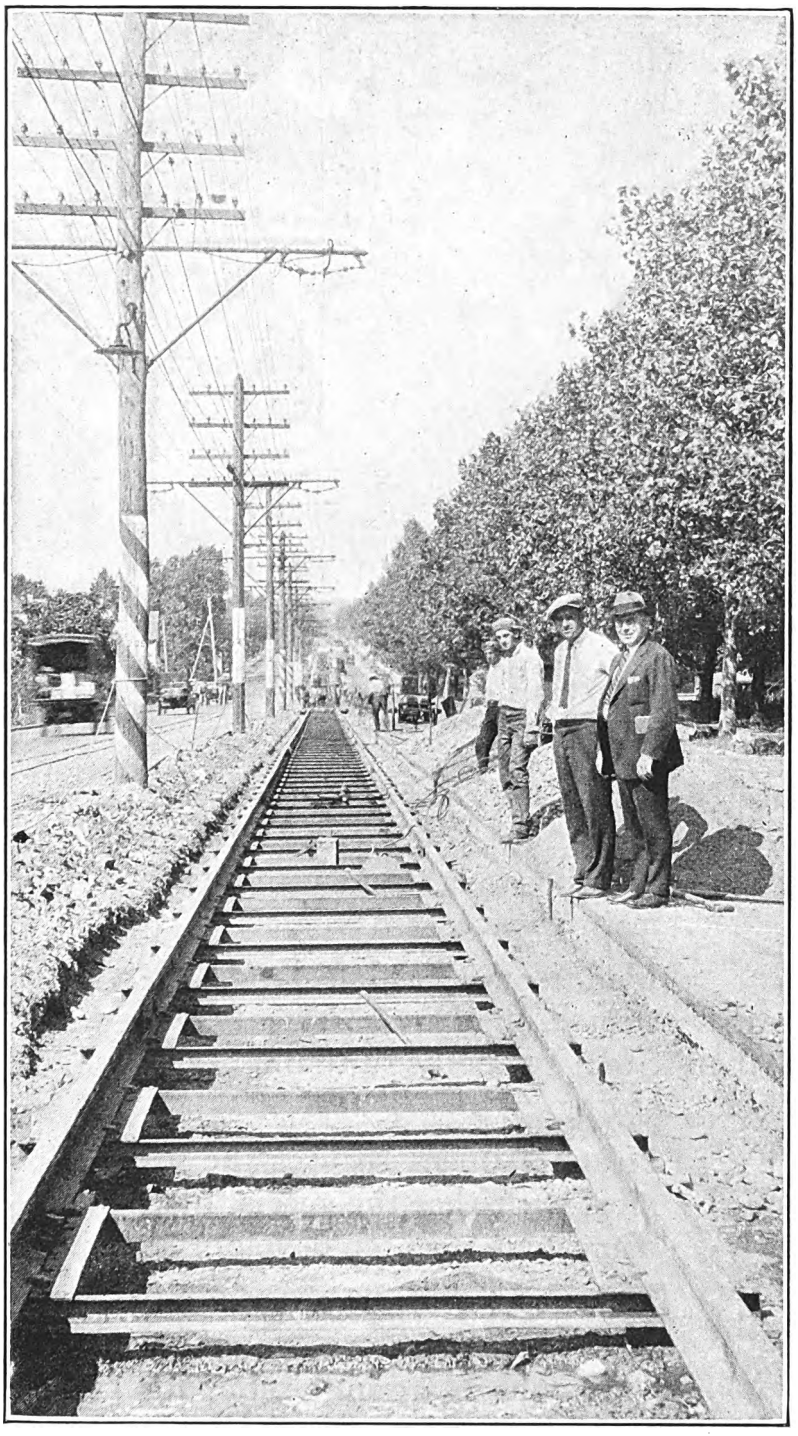
Check steel tie construction with these essentials of good paved track—



BEARING—The efficient design of Steel Twin Ties provides 156 square inches of effective bearing per track-foot at the lowest cost per unit of bearing — and, where it is most needed, 468 sq. in. of bearing under each joint.

PERMANENT MATERIALS—In Steel Twin Tie construction, the tie structure embedded in concrete is not affected by water, temperature variations or rot.

ECONOMY—Steel Tie Track minimizes excavation, concrete and track labor. It costs no more than wood ties in rock ballast and its longer life decreases the cost per track-foot per year.

For estimating get the 1926 prices at your delivery point.

The International Steel Tie Company
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track—Permanent Foundation

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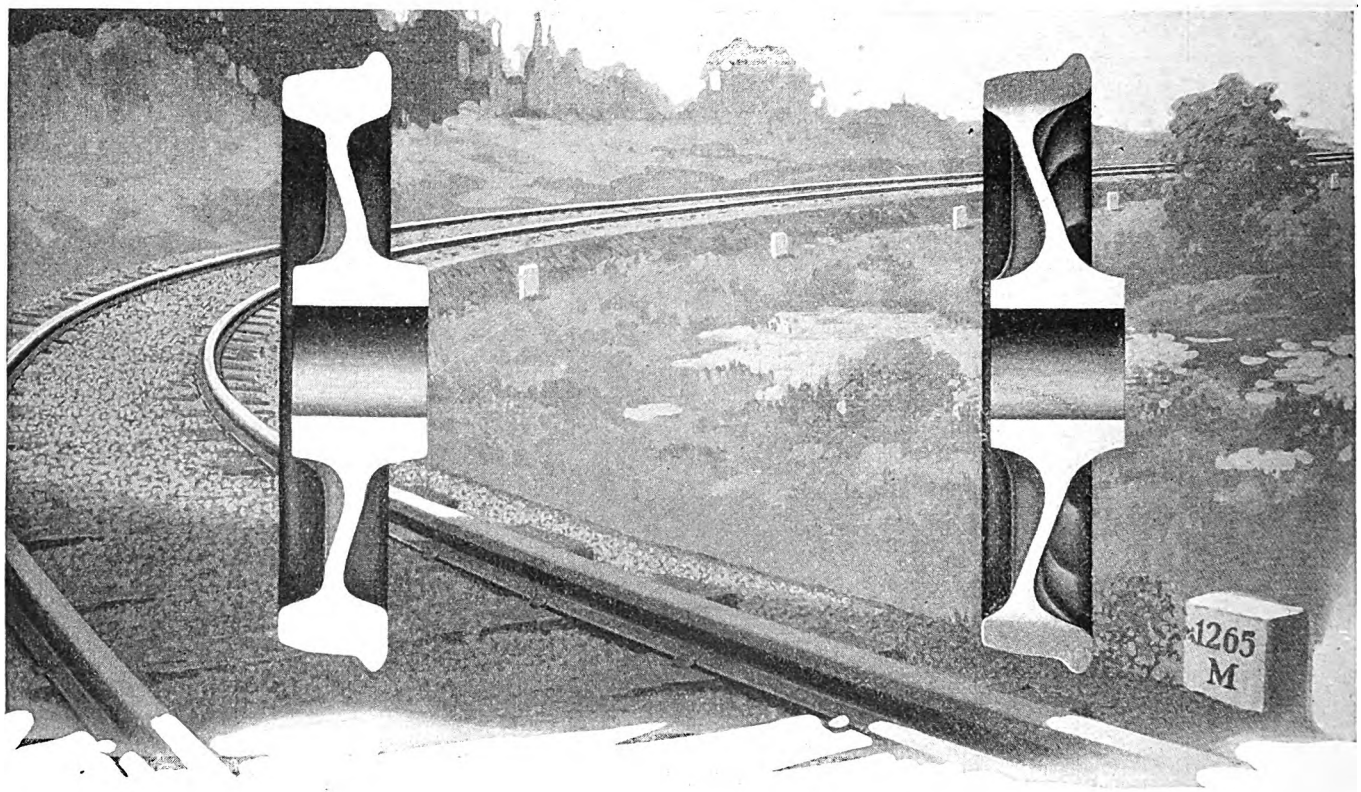

Metal or Mileage

IN this "multiple wear wheel" you get a lot of metal for your money. But it's mileage, not metal, you're after.

This un-treated tread soon wears. The wheel is removed, sent to the shop for re-turning, comes back, is reapplied and the shimms adjusted for correct platform height.

But it quickly wears again and the maintenance story is repeated.

Finally after another interval of service it is discarded.

IN this Davis "One-Wear" Wheel, you get the mileage with less weight and without the maintenance.

Made from special steel and heat-treated, the Davis "One-Wear" Steel Wheel is fundamentally strong.

Heat treatment secures the utmost wear that the special high manganese steel can develop.

The Davis "One-Wear" Steel Wheel keeps running while other wheels are in the shop for turning. Buy Davis Steel Wheels for greater serviceability of equipment.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

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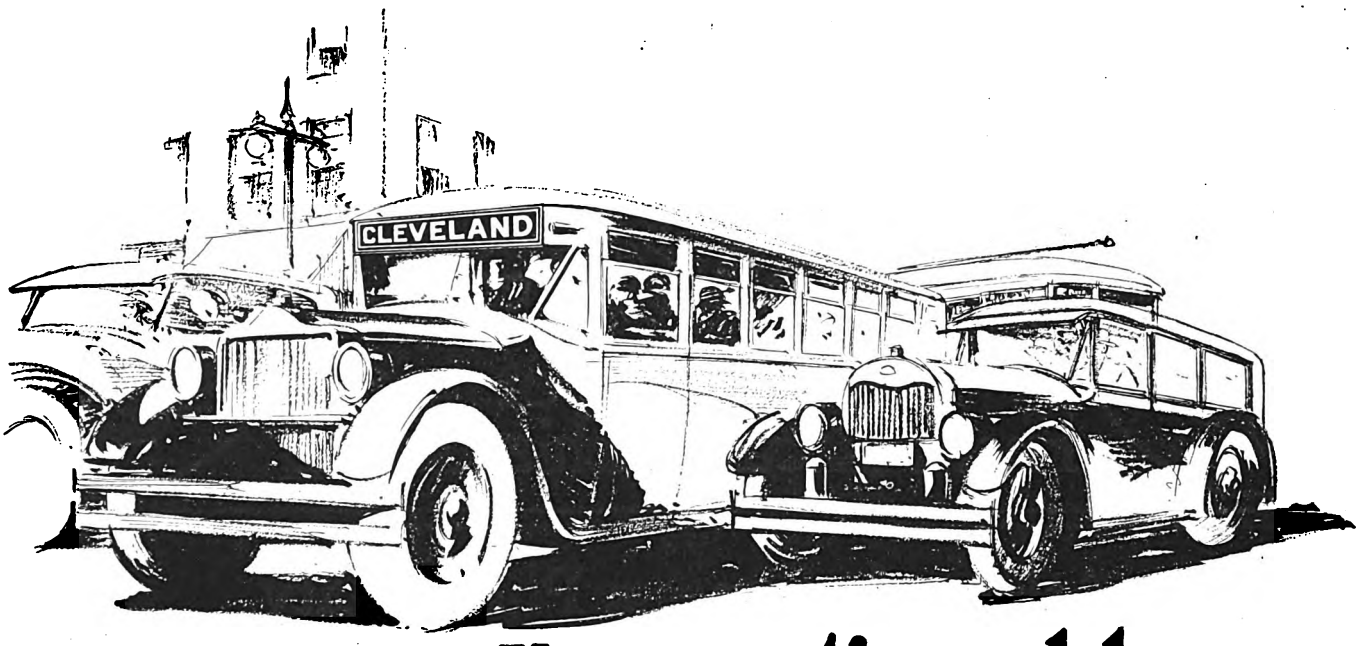

A familiar scene in many of the larger cities, where attractive buses with Bender-built bodies and Hunter Signs are popular!

Unquestionably a public conveyance!

That's the business touch which Hunter Signs give to the motor bus

By day or night Hunter Signs "Tell the Public where you're going." Reliable bus companies operating on fixed routes and schedules sell the public their transportation service by means of Hunter Signs. They are made in types for every service.

ELECTRIC SERVICE SUPPLIES CO.

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Illinois Merchants' Bank Bldg.

PITTSBURGH
1123 Bessemer Building

BOSTON
88 Broad St.

SCRANTON
316 N. Washington Ave.

DETROIT
General Motors Building

Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

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The Phono Record

1865 — 1926

A bulletin of Phono-Electric Achievement

Atlanta becomes a Phono City

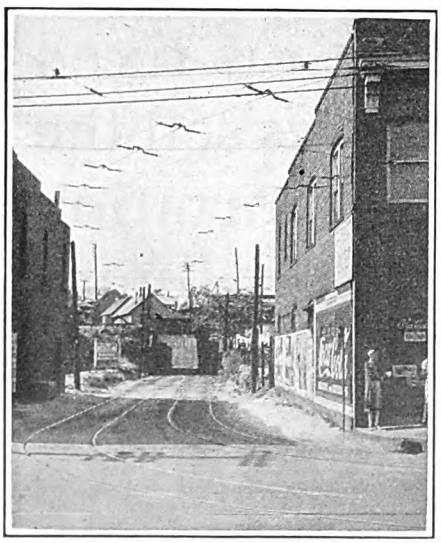
Modern overhead and modern cars help build street railway prosperity

Where Sherman Marched Car Bell Now Clangs

Eighty-two years ago Atlanta had not been thought of. Today she ranks sixth city of the United States,— the booming industrial headquarters of the South.

The car bell, sign of prosperity and progress, now clangs merrily where Sherman's soldiers once trod. And Phono-Electric Trolley Wire, sign of progressive thinking in overhead construction, now totals 20 miles in and around the city.

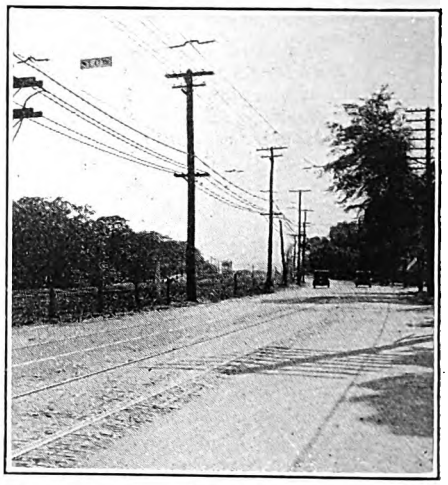
Thus Phono-Electric in service again proves claims made on a basis of its performance in practically every city of importance in the United States. It outwears ordinary hard drawn copper two to three times. It reduces wire breakage. It possesses fatigue resistance and high tensile strength of particular value to operators of city systems such as that in Atlanta, where sharp curves, short headways and heavy traffic are rules of the day.



"Bridgeport" BRASS TRADE CO. MARK Phono-Electric

Rapidly becoming standard in Atlanta

Strength, toughness and ductility at such places are good qualities on which to build.



Rejected—becomes dominant city

Old Story of Stone Rejected by Builders Becoming Corner Stone of South

When the Georgia Railroad wanted to build its terminus in Decatur, Georgia, the inhabitants refused permission, so the line was extended 6 miles, and a new village established. At the time this village was called, appropriately, Terminus. Now it is called Atlanta, sixth city of the country,— *and Decatur is one of its suburbs.*

The moral being that it pays to keep well abreast of developments, and to take good care that prejudice never becomes a handicap whether you buy real estate or trolley wire. Have you had your copy of the Phono-Electric Book? Better let us send you one right now, it is full of interesting facts.

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

Bridgeport Brass Company
BRIDGEPORT - CONNECTICUT

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213,492 COACH MILES *and* ONLY *ONE* STOP *for* MECHANICAL TROUBLE

YELLOW KNIGHT

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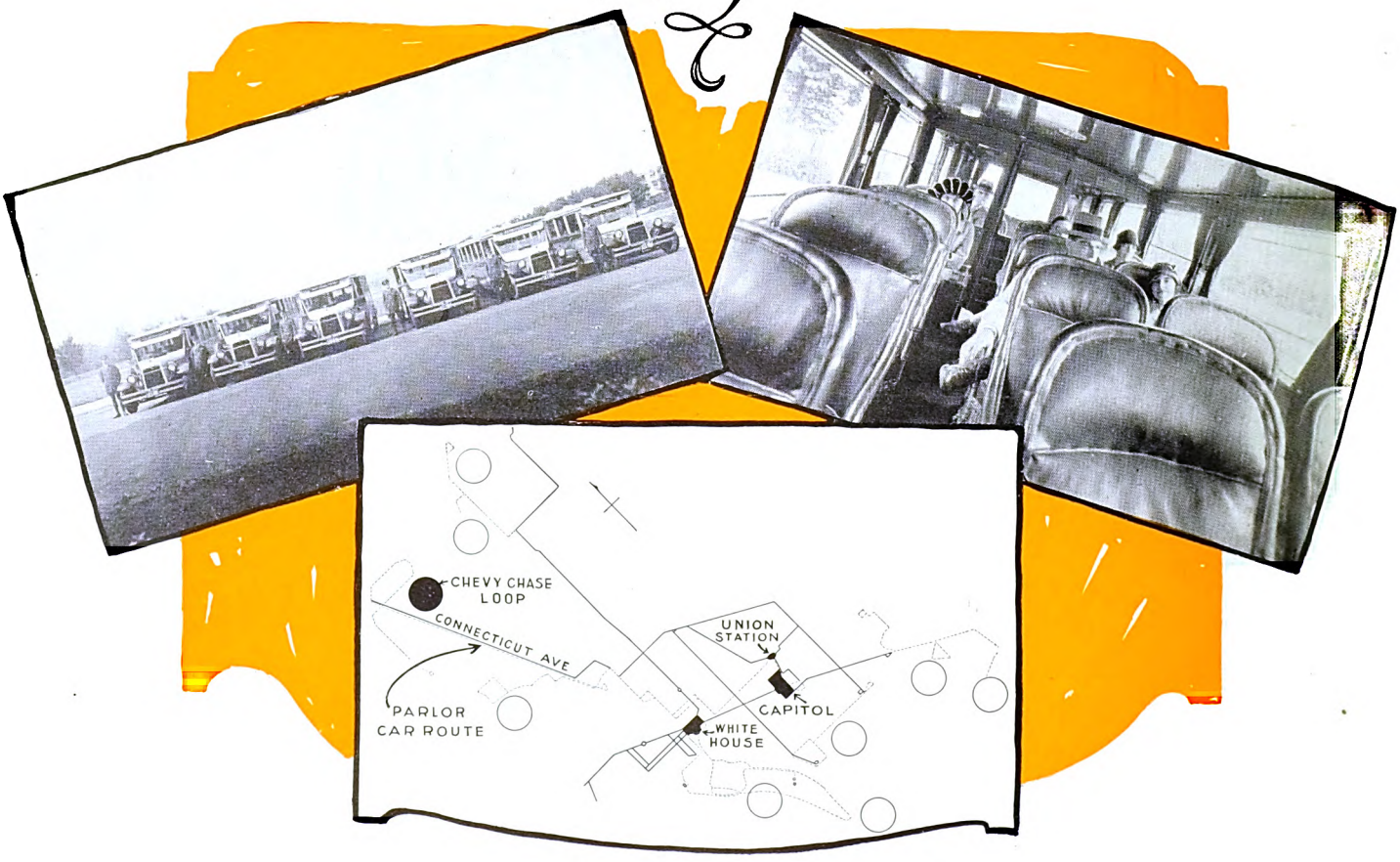
that's PERFORMANCE

the exclusive CHEVY CHASE RUN uses YELLOW PARLOR COACHES -exclusively



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HE Capital Traction Company at Washington D. C., operate eight Yellow Parlor Coaches over the exclusive Chevy Chase Coach Line.

Only *once* in 213,492 miles has a Yellow Coach been out of service for mechanical trouble—and then only for a few hours.

Moreover, during 1925 when covering a total of 98,000 miles there were only nine delays on the road from trouble of *any sort,* including tires. Only 282 minutes lost from all causes.

That's performance!!

The service was inaugurated on September 15, 1925, to operate on a route eight miles long, connecting the exclusive Chevy Chase suburb with the downtown section, including the Union Station and the Capitol.

The fare was fixed at 25 cents with a policy of giving the finest possible class of service with a seat for every person, no standees even during peak hours.

From the beginning the operation was a success. Within eleven weeks the company was making money, and profits have been steadily climbing up ever since.

Eight Yellow Parlor Coaches are now averaging 130 miles a day, and each is constantly contributing to the

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success of the operation, as is proven by the accompanying operating cost figures, in cents per mile.

Everybody rides on the Chevy Chase Coach Line from Senators to children, and the service duplicates that given by the Company's own street cars at something more than three times the fare. No apparent reduction has been noted on the car lines, in fact the tendency for street car riding shows an increase, due to general local trend. The traffic attracted by this de luxe service is new business, or business which the Capital Traction Company had years ago and which slipped away during the rapid growth of the private automobile.

Yellow Coach *plus* General Motors are at *your* service to help you build up profitable operations.

	Cents per Mile
MAINTENANCE	
Buildings	0.30
Bus Bodies	0.39
Bus Chassis	1.12
Tires and Tubes	1.75
Shops and Garage Equipment	0.01
Service cars — maintenance and operation	0.06
Depreciation	5.13
TOTAL	8.76
GARAGE OPERATION	
Garage Employees	1.41
Garage Supplies and Expenses	0.66
TOTAL	2.07
TRANSPORTATION	
Chauffeurs' Wages	5.66
Gasoline	3.38
Lubricants	0.22
Other transportation expenses	0.47
TOTAL	9.73
TRAFFIC PROMOTION	
Advertising	0.04
GENERAL AND MISCELLANEOUS	
Officers' Salaries	0.32
Injuries and Damages	0.11
Insurance	0.01
Rent of Equipment	0.16
Miscellaneous and General	0.05
TOTAL	0.65
Taxes	1.00
Operating Expenses and Taxes.	22.25

YELLOW KNIGHT

YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.

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SOLDIERS AND SAILORS MONUMENT, CLEVELAND, OHIO

NP

RECOGNITION

This monument commemorates a service rendered. It is a token that the public is both quick and certain to appreciate all contributions to its safety, comfort and protection.

In a more humble capacity, National Pneumatic Door and Step Controlling Mechanisms have also contributed to public safety. On the cars of Cleveland and in many other cities, therefore, these devices play no small part in the maintenance of favorable public relations and increasing the number who faithfully contribute to the street car fare box.

NATIONAL PNEUMATIC COMPANY

Executive Office: 50 Church Street, New York
General Works: Rahway, New Jersey

MANUFACTURED IN

CHICAGO
518 McCormick Building

TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building

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Pat. Off.

GAS-ELECTRIC —one-motor drive

Economy points to one motor

Only one electric motor is used in the Mack Gas-Electric One-Motor Bus.

Mack engineers *might* have adopted the usual two motor drive, but one motor does the job where two motors mean more weight, more care and higher maintenance costs.

Economy for the operator, and the value of retaining the standard Mack rear axle and single propeller shaft, pointed to one motor drive as the logical design behind which Mack could stand 100 per cent. Motor is high speed type, driving through dual reduction gears and differential to the rear wheels. Road clearance is the same as in the standard Mack gear driven bus.

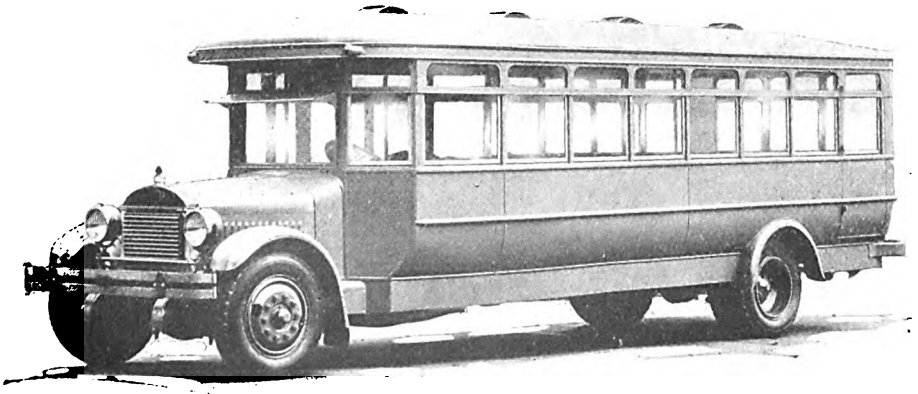
Again Mack wins by employing a Rubber Torsion Insulator to take up the inertia of the generator and armature. Only Mack uses this feature, developed after long experience with Rubber Shock Insulators. Self-excited generator and the one motor are both mounted in rubber.

Mack engineering skill also provides complete accessibility to all electrical units for inspection and repairs. They can be reached through conveniently situated trap doors in the floor or they can be removed from below without interfering with adjacent assemblies.

If you are looking for more service hours on the road, faster schedules, ease of maintenance and more profitable operation, investigate the Mack Gas-Electric One-Motor Bus through the Mack direct factory branch nearest to you.

MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
25 Broadway, New York City

One hundred and seven direct MACK factory branches operate under the titles of: "MACK MOTOR TRUCK COMPANY," "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION," or "MACK TRUCKS OF CANADA, Ltd."



The Mack Bus

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Each of Your Salesmen Should Have the 1926 Edition

Electric Railway Directory

Because:—

All purchases are passed upon by two and often three officials before the order is placed. If your salesmen are not procuring orders they are not interviewing the proper officials.

With 65% changes in this directory over 1925, it is very important your salesmen are directed right to save time and possibly embarrassment.

$296,000,000 will be spent this year for new equipment, material and supplies—Can your salesmen afford to make one false step on his introduction?

The above holds true respecting your mailing lists. With six changes for each property listed makes your old mailing list practically worthless.

It is too expensive to have your literature go wrong. In fact the directory pays for itself many times over the first campaign.

Price $7.50 for one copy—

10% off for five or more.

Leading Features

1—Complete list of every recorded electric railway company in the United States, Canada, Mexico, and the West Indies.

2—List and addresses of officials, superintendents, department heads and purchasing agents, corrected to date of issue.

3—Addresses of companies operating buses.

4—Addresses of bus repair shops.

5—Mileage of track and bus routes.

6—Number and kinds of cars used.

7—Rates of fare.

8—Amusement parks owned or reached.

Directory Department, Electric Railway Journal, 10th Avenue and 36th St., New York, N. Y.

Gentlemen:—Will you please send me:

.....copies of 1926 McGraw Electric Railway Directory, check for $..... enclosed.

.....More complete information concerning contents.

Name .....

Company .....

Street .....

City .....State .....

E.R.J. 6-26-26

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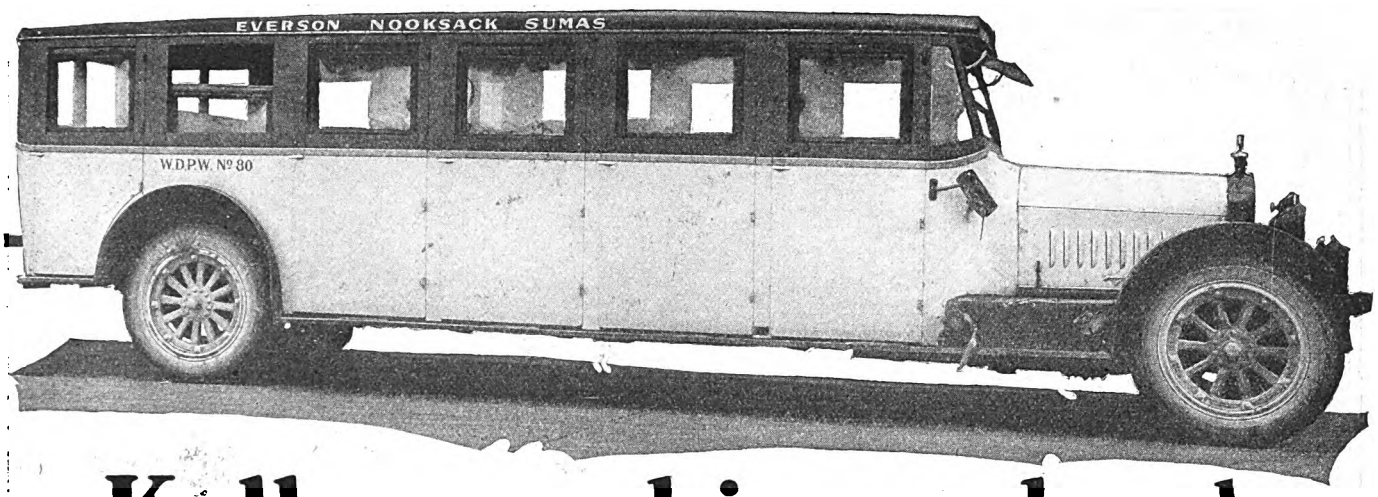

Kellys cut his overhead better than 40 percent

STAGES
BELLINGHAM PHONE 1956
AFTER 6 P. M.—200
SUMAS
PHONE X-226: X-421

NOOKSACK
NOOKSACK

J. C. HESSELGRAVE
SUMAS, WASH
January 28th, 1926

Kelly-Springfield Tire Company,
1412 Ninth Avenue,
Seattle, Washington.

Attention Mr. P. E. Myers, Branch Manager

Dear Mr. Myers:

You may, if you wish, use the following information for advertising purposes.

As you know, I have been using Kelly-Springfield Heavy Duty Tires on my six motor coaches operating out of Bellingham to Sumas and way points for sometime and I have found after years of experimenting with other makes of tires that my overhead expense on tires has been cut better than forty percent thru the use of your Heavy Duty line. I am operating one twenty passenger Fageol with 36 x 6 Singles on the front and 36 x 6 Duals on the rear; also one twenty passenger White with 36 x 6 Singles on the front and rear. I have four Packards on 35 x 5 Heavy Duty Tires.

It is rare indeed that a tire goes out of service at a mileage less than thirty thousand miles on any of these cars. Considering that fifty percent of my run is over dirt and gravel roads, the mileage I have been receiving from your tires is nothing short of phenomenal. You may rest assured that so long as your merchandise delivers the service it has in the past, I will be one of your strongest boosters.

Very truly yours,

J. C. Hesselgrave.

KELLY HEAVY DUTY CORD

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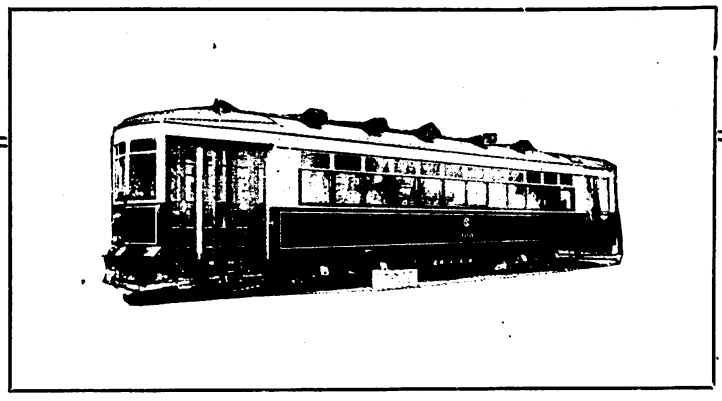

The Modern Car
is a business builder

WHAT could be more effective in drawing increased patronage to the electric railway than the modern car? Its convenience has never been equalled. Now it is more pleasing in appearance, more comfortable to ride in, and quieter than ever before.

With all the modern features the street car is becoming the preferred method of transportation.

Among recent orders received by this company is one for 34 cars of the type illustrated, for the Chicago Surface Lines.

Cummings Car and Coach Company

Successor to McGuire-Cummings Mfg. Co.

111 W. Monroe St., Chicago, Ill.

Light Weight City and Interurban Cars — Single and Double Trucks

Cummings Gas-Electric Motor Coach

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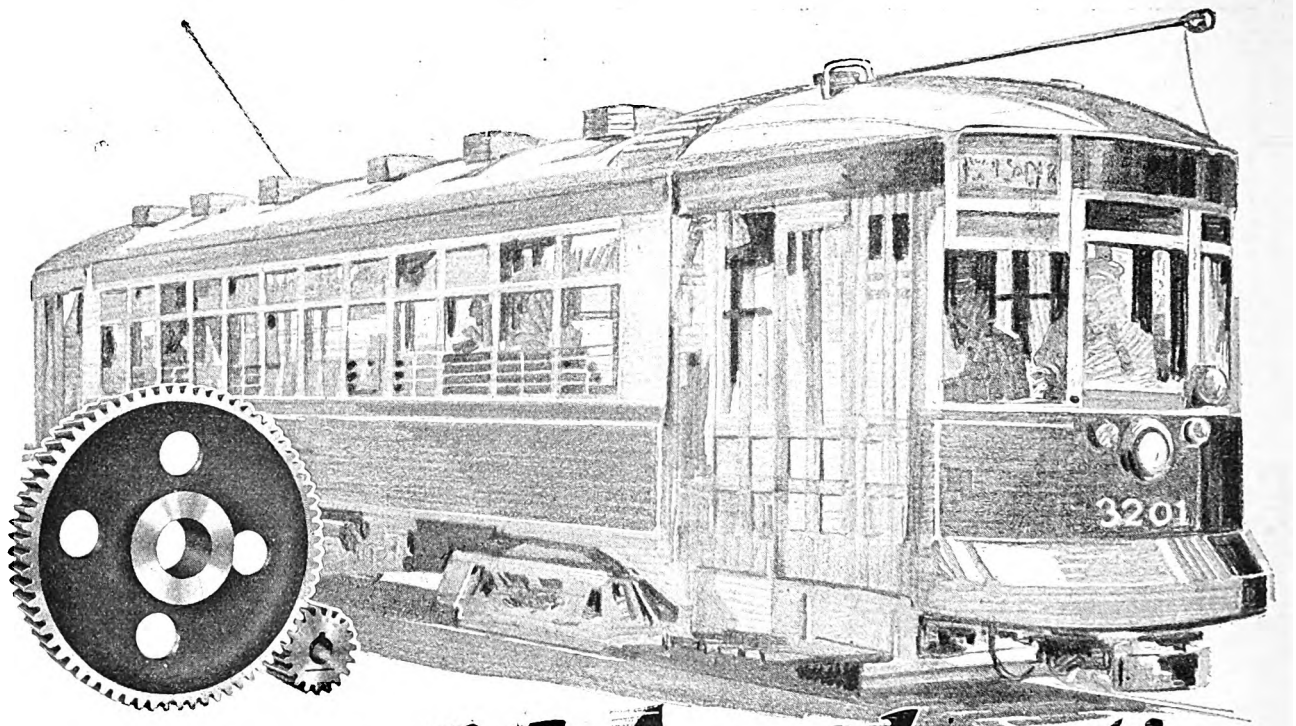


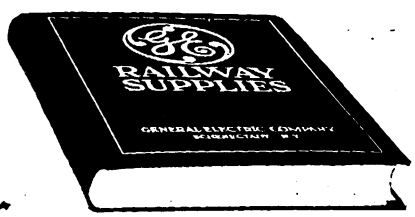
Rapid Acceleration
~ a test and proof of Gearing

Near the top of the list of high-schedule-speed systems is the Chicago Surface Lines, maintaining this position in spite of traffic congestion that is equalled in few cities.

Tough, indeed, must be the gears which will stand such gruelling, rapid-acceleration service as Chicago's—and the Chicago Surface Lines selected grade M Gears and Pinions for more than half its requirements of the past year, and for its total 1926 requirements.

Bear this fact in mind in connection with your modern-cars-for-better-service program in which rapid acceleration is so vital a factor.

G-E Railway Gearing is favored by research facilities that are unsurpassed, and nothing is omitted from the processes of its manufacture and test that will help insure the highest-quality product that it is possible to produce.



For
Modern Equipment Standards

54C-32

GENERAL ELECTRIC

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Put modern hand brakes on modern safety cars—

Many electric railway transportation systems need to replace thousands of obsolete cars with new light-weight types—in which safety is an all important factor. These companies can easily meet this equipment of safety in hand brakes by installing—

Peacock Staffless Brakes

Thoroughly up-to-date in every particular they can develop three times the braking capacity of ordinary hand brakes. Their 144-in. chain winding capacity insures adequate braking power even though brake shoes are worn and brake rigging is loose.

Minimum platform space, simplicity of operation, low installation costs and low maintenance costs are other factors that adapt Peacock Staffless Brakes to the newest light-weight safety cars.

The Peacock Staffless

**Ask for further facts and figures—
and for estimates on your installation.**

NATIONAL BRAKE CO., Inc.
890 Ellicott Sq., BUFFALO, N. Y.

Canadian Representatives:
Lyman Tube & Supply Company, Limited, Montreal, Canada

Digitized by Google

Bankers and Engineers

Ford, Bacon & Davis
Incorporated
Engineers
115 Broadway, New York
PHILADELPHIA CHICAGO SAN FRANCISCO

The J. G. White Engineering Corporation
Engineers—Constructors
Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.
43 Exchange Place New York

STONE & WEBSTER
Incorporated
EXAMINATIONS REPORTS APPRAISALS
ON
INDUSTRIAL AND PUBLIC SERVICE PROPERTIES
New York Boston Chicago

THE BEELER ORGANIZATION
ENGINEERS AND CONSULTANTS
Traction - Traffic - Equipment - Power Investigations
TRANSPORTATION, TRAFFIC, AND OPERATING SURVEYS
COORDINATING SERVICE—FINANCIAL REPORTS
APPRAISALS—MANAGEMENT
52 Vanderbilt Ave. New York

SANDERSON & PORTER
ENGINEERS
PUBLIC UTILITIES & INDUSTRIALS
Design Construction Management
Examinations Reports Valuations
CHICAGO NEW YORK SAN FRANCISCO

ENGELHARDT W. HOLST
Consulting Engineer
Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management
683 Atlantic Ave., BOSTON, MASS.

ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER, MASSACHUSETTS
REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

KELKER, DeLEUW & CO.
CONSULTING ENGINEERS
REPORTS ON
Operating Problems Rates Traffic Surveys
111 W. Washington Street, Chicago, Ill.

C. B. BUCHANAN, President — W. H. PRICE, JR., Sec'y-Treas. — JOHN F. LAYNG, Vice-President
BUCHANAN & LAYNG CORPORATION
Engineering and Management, Construction, Financial Reports, Traffic Surveys and Equipment Maintenance
BALTIMORE, 1904 Citizens National Bank Bldg. — Phone: Hanover: 2142 — NEW YORK, 49 Wall Street

DAY & ZIMMERMANN, INC.
ENGINEERS
DESIGN - CONSTRUCTION - REPORTS
VALUATIONS - MANAGEMENT
NEW YORK PHILADELPHIA CHICAGO

HEMPHILL & WELLS
CONSULTING ENGINEERS
Gardner F. Wells Albert W. Hemphill
APPRAISALS
INVESTIGATIONS COVERING
Reorganization Management Operation Construction
43 Cedar Street, New York City

STEVENS & WOOD
INCORPORATED
ENGINEERS AND CONSTRUCTORS
120 BROADWAY, NEW YORK
ENGINEERING CONSTRUCTION — YOUNGSTOWN, O. — FINANCING MANAGEMENT

WALTER JACKSON
Consultant on Fares and Motor Buses
The Weekly and Sunday Pass—Differential Fares—Ride Selling
143 Crary Ave., Mt. Vernon, N. Y.

Transmission Line and Special Crossing Structures, Catenary Bridges
WRITE FOR OUR NEW DESCRIPTIVE CATALOG
ARCHBOLD-BRADY CO.
Engineers and Contractors SYRACUSE, N. Y.

Byllesby Engineering & Management Corporation
231 S. La Salle Street, Chicago
New York San Francisco

McCLELLAN & JUNKERSFELD
Incorporated
ENGINEERING AND CONSTRUCTION
Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 Trinity Place, New York
CHICAGO ST. LOUIS

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JAMES E. ALLISON & CO.
Consulting Engineers
Specializing in Utility Rate Cases and Reports to Bankers and Investors
1017 Olive St., St. Louis, Mo.

THE P. EDWARD WISH SERVICE
50 Church St. NEW YORK — *Street Railway Inspection* DETECTIVES — 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

NAUGLE POLES
WESTERN & NORTHERN CEDAR
NAUGLE POLE & TIE CO.
59 E. MADISON ST. CHICAGO ILL.
New York · Columbus · Kansas City · Spokane · Vancouver · Boston

"Axle Specialist Since 1866"
Address all Mail to Post Office Box 515, Richmond, Va.
CAR AXLES
J. R. JOHNSON AND CO., INC.
FORGED STEEL AXLES
For Locomotives, Passenger, Freight and Electric Cars
Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large Shafts, Round Bars, etc.

WELDING CABLE
ELECTRICAL WIRES and CABLES
John A. Roebling's Sons Company, Trenton, N. J.

A Single Segment or a Complete Commutator
is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command out utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we built. That's why so many electric railway men rely absolutely on our name.
Cameron Electrical Mfg. Co., Ansonia, Connecticut

BRAZED **Rail Bonds** ARC WELD
Portable Arc Welding Outfits
The Electric Railway Improvement Co.
Cleveland, Ohio

Northern **CEDAR POLES** Western
We guarantee
all grades of poles; also any butt-treating specifications
BELL LUMBER COMPANY
Minneapolis, Minn.

Shuler
Front Axles

For:
TRUCKS
MOTOR BUSSES
TAXIS
TRACTORS
TRAILERS

We only broadcast about once a month—a short program at that.

Boiled down it can be relayed in 10 words:

SHULER makes FRONT AXLES ONLY—that's why they are superior.

Shuler Axle Co.
INCORPORATED
LOUISVILLE, KY.

Member of Motor Truck Industries, Inc., of America

Digitized by Google

"A"ssuring "B"etter "C"ontact

AN A. B. C. report is a businesslike, deciding authority that has replaced the old custom of buying space on certain "claims" of the publisher.

The publisher with space to sell submits the facts about his business in the form of a statement to the Audit Bureau of Circulations. This statement after it is checked, approved or audited by the Bureau is used to place the publisher's wares before the Advertiser who is buying space.

The Advertiser knowing the thoroughness of A. B. C. methods safely bases his decision on the Verified Facts contained in the A. B. C. report.

The Audit Bureau of Circulations has brought together the Buyer and Seller of Space upon a basis of Mutual Confidence.

The careful Advertiser knows that the purchase of Space by A. B. C. reports cuts out inflated Waste Circulation and saves money that would otherwise be lost in paying for unproductive space.

Study the latest A. B. C. report of Electric Railway Journal before placing your advertising. A copy will be furnished on request.

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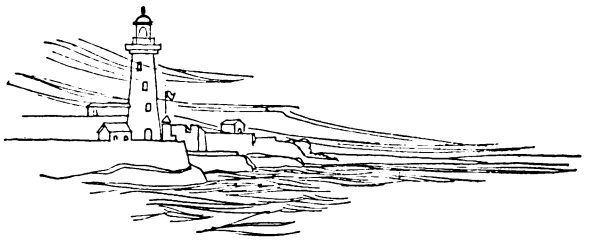

Cast Iron and Cast Advertising

Ordinary run-of-foundry iron will not work as well in brake shoes as a specially developed metal, melted for this purpose only, poured around a bundle of expanded steel, chilled at the ends and reinforced at the back. One is plain cast iron. The other is iron which has been definitely *organized* to do more and better work.

Railway men, therefore, do not expect as much from one form of brake shoe as from the other. Is it any more logical to expect similar results from two different forms of advertising?

Both equipment and public-relations advertising sometimes bear the stamp of an ordinary run-of-the-office job. In other instances the advertising clearly has been cast from especially selected words, poured around a bundle of experience, sharpened at the ends and reinforced with an attractive illustration or typography. It is advertising definitely *organized* to do more and better work.

Just as the specialist, moreover, casts a better brake shoe than the general jobbing foundry, the specialist in transportation advertising should accomplish the best work for the equipment manufacturers and railways. Transportation is a business unlike any other in existence. So is transportation advertising and the man who thinks that general advertising knowledge is all that is required in the advertising of a brake shoe is no closer to the truth than one who thinks he needs to know the brake shoe only.

We are not a general advertising agency which casts its metal in a hundred different moulds. The lighthouse trademark—symbol of our workmanship—appears exclusively on transportation literature. We hope that transportation men will learn to look for it and, while we are already serving quite a number of the prominent advertisers in this field, we would be glad to talk to all who feel that their advertising, like their brake shoes, might be organized to do more and better work.

Doyle, Kitchen & McCormick, Inc.
2 WEST 45th STREET, NEW YORK
An Advertising Agency

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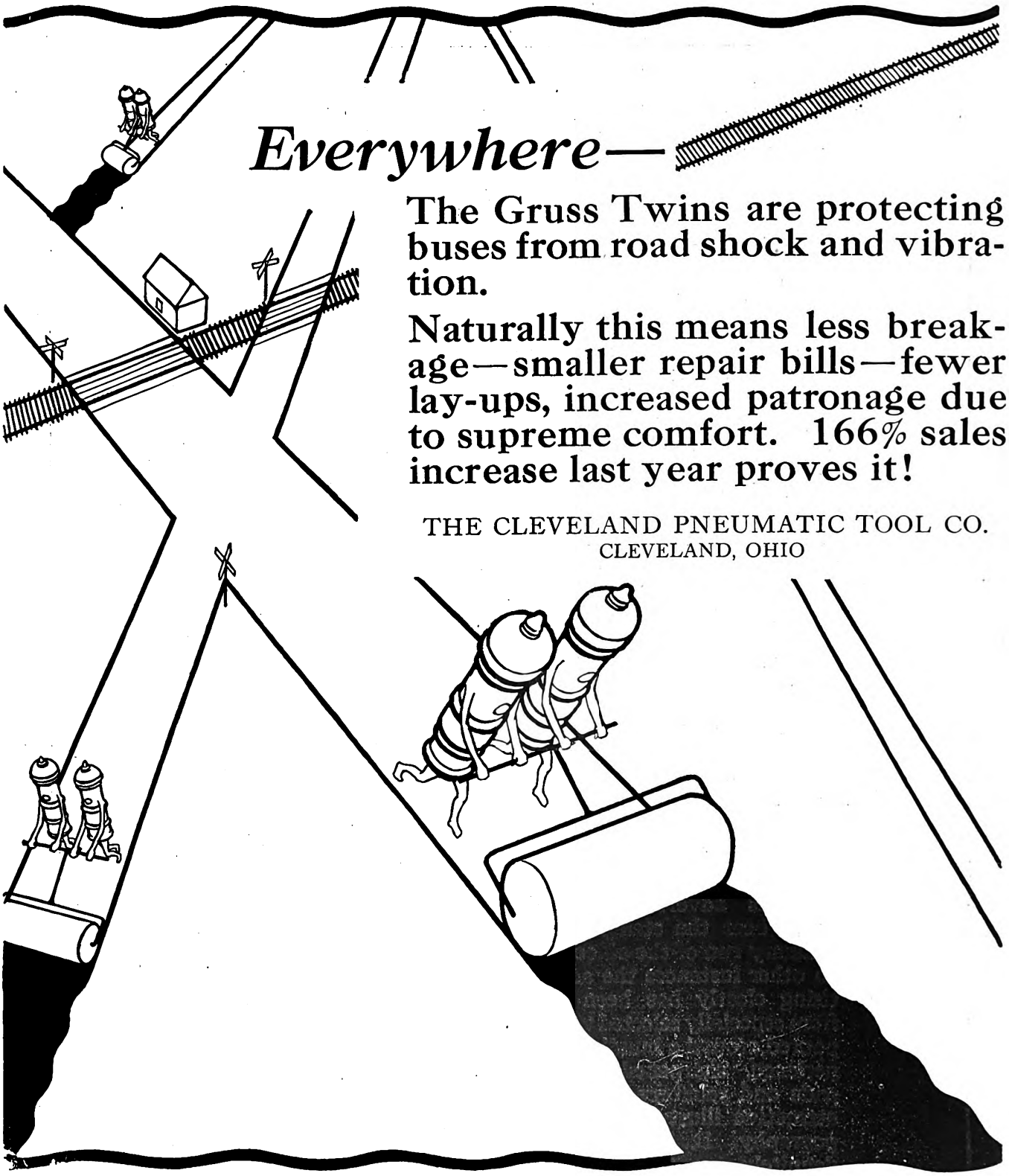

Everywhere—

The Gruss Twins are protecting buses from road shock and vibration.

Naturally this means less breakage—smaller repair bills—fewer lay-ups, increased patronage due to supreme comfort. 166% sales increase last year proves it!

THE CLEVELAND PNEUMATIC TOOL CO.
CLEVELAND, OHIO

GRUSS AIR SPRINGS

for Trucks, Buses Passenger Cars ~

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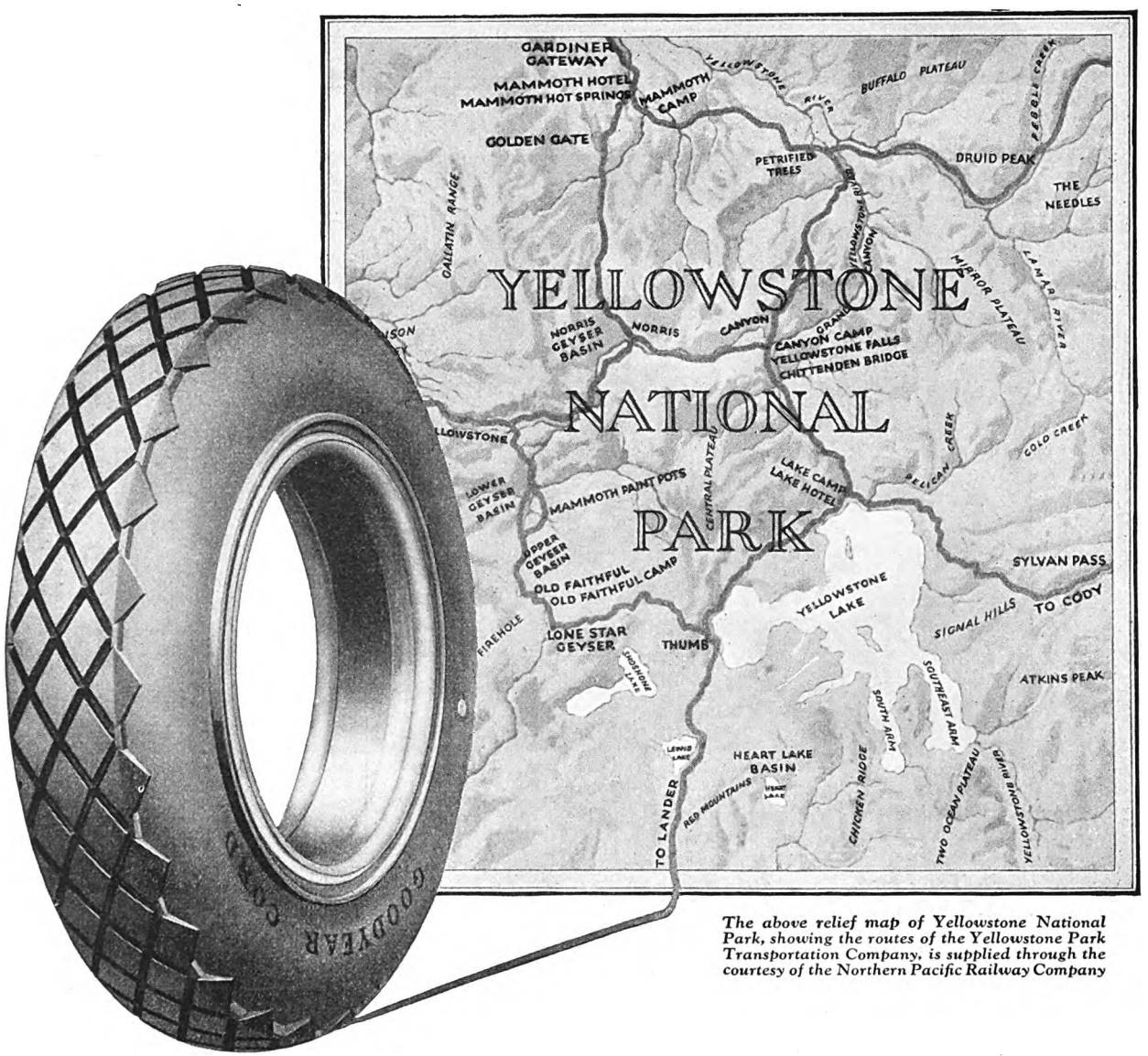

The above relief map of Yellowstone National Park, showing the routes of the Yellowstone Park Transportation Company, is supplied through the courtesy of the Northern Pacific Railway Company

What SUPERTWIST Adds to Goodyear Tires

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus Tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other injuries. It thus insures virtually *double* the *carcass* life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

Copyright 1926, by The Goodyear Tire & Rubber Co., Inc.

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Nothing takes the place of Leather

In selling rides - - -

Nothing helps more than a comfy seat

Your customers are easily persuaded to wait for the car that has the most comfortable seats. . .

And your costs-per-mile maintenance are reduced when you use real leather, for it will stand up years longer than any other covering.

We are able to offer you complete hides or we will cut them to your pattern, if you submit paper templets.

This subject is one that demands your immediate attention. Send for samples for your examination.

- Hyaline Grains
- Hand Buffs
- Machine Buffs
- Special Machine Buffs

Cleveland
Denison Ave.
and Jennings Rd.

Western Representatives
Midgeley & Borrowdale
McCormick Bldg., Chicago

© Tanning Company
Cleveland, Ohio

Eastern Representatives
L. D. Rockwell Co.
Nat'l City Bldg., N. Y. C.

HYALINE

The Finest Coach Leather Obtainable

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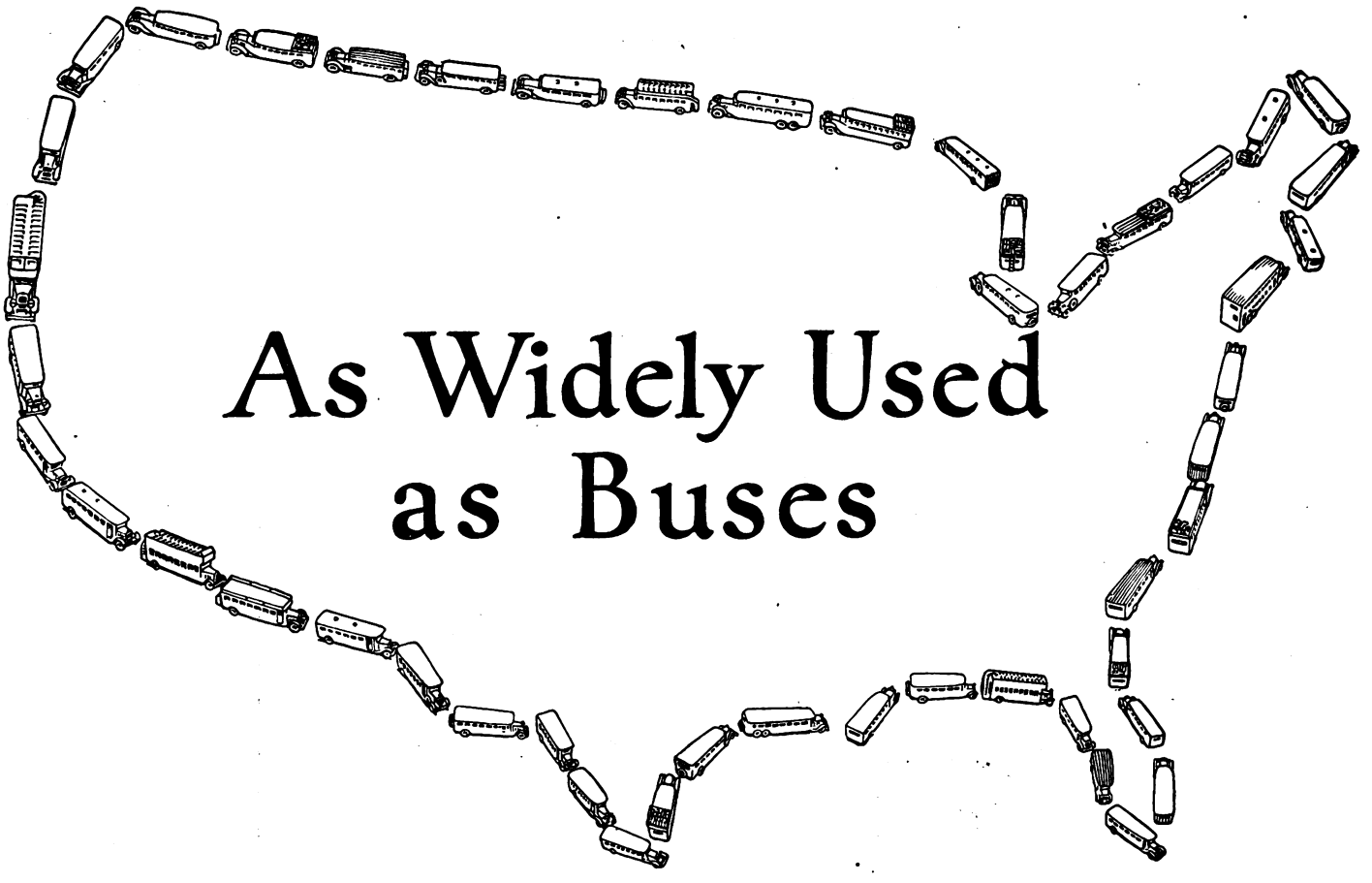

As Widely Used as Buses

THE giant growth of the bus industry has been almost entirely an increase in the number of Timken-equipped buses! For more than 95% of all makes of buses in America are engineered around Timken Tapered Roller Bearings. Never has the endorsement of a single automotive unit been more nearly unanimous. The most notable thing about it is that Timkens are so successfully serving the two masters of the modern bus—the Management with its constantly stricter cost standards—and the Public with its constantly higher service demands.

Maintenance departments know that Timkens hold shafts, gears and wheels in permanent fine alignment, with no attention but greasing or oiling, at comparatively rare intervals. The threat of bearing thrust, shock and speed is nullified by Timken tapered design, *POSITIVELY ALIGNED ROLLS* and Timken-made steel. Timkens are *more* than anti-friction bearings!

To bus passengers Timkens mean smoother, surer transportation, on schedule, at rates which are favorably affected by Timken economies.

Logically, in buses, as in trucks and rail cars, Timken Bearings are provided by an overwhelming majority of all makers.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**

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Digitized by Google

for smoothness and easy riding"

"WE have taken special pains in our track construction work to build for smoothness and easy riding, both for our own cars and for automobile traffic." So says John R. McKay, Chief Engineer of the Indiana Service Corporation.

"Particular attention has been paid to arterial crossings, with the result that motorists can cross the tracks without feeling them at all.

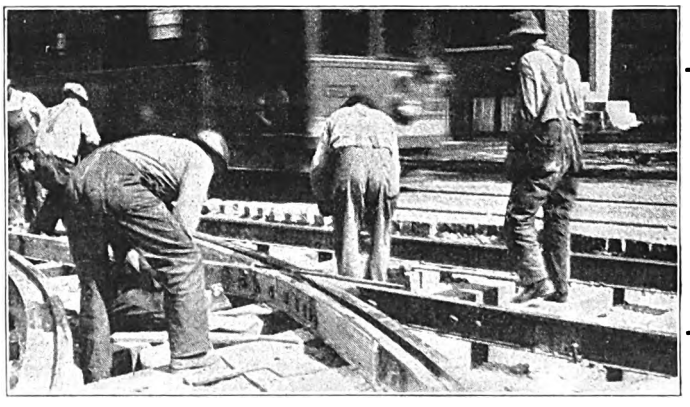
"We have been greatly aided in our endeavor to get smoother, less noisy crossings, by the use of an asphaltic cushion next to the rails. This has the advantage of being easily applied, and in addition to deadening sound it gives us a tight construction that keeps out water."

To improve track construction in Fort Wayne, the Indiana Service Corporation has made extensive use of the Carey Elastite System of Track Insulation—and with highly successful results. Complete information on request.

The Philip Carey Company

Lockland, Cincinnati, Ohio

Fort Wayne electric railway tracks in process of construction — showing the slabs of Carey Elastite Rail Filler in place.



The Carey Elastite System of Track Insulation consists of precast slabs of a fibrous asphaltic compound, which form a resilient cushion between rails and pavement. A blow with a sledge sets the slabs in place. Unaffected by moisture or changes in temperature.

Carey Elastite

REG. U.S. PAT. OFF.

SYSTEM OF TRACK INSULATION

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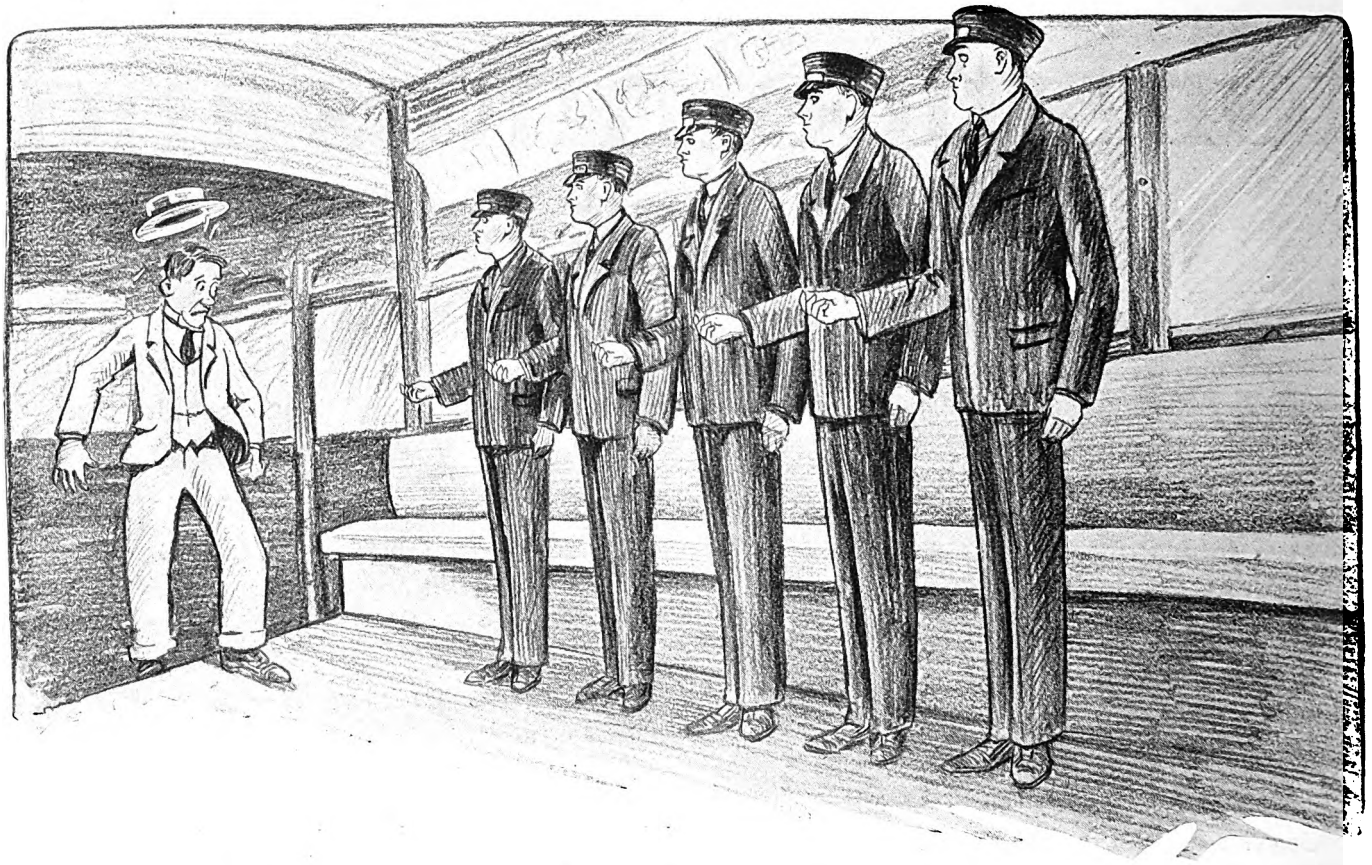


Five Conductors On One Car

Just suppose you boarded a street-car and were confronted by five conductors.

No. 1 says, "I want three cents for labor."
No. 2 " "I want one cent for interest on bonds."
No. 3 " "I want one cent for power."
No. 4 " "I want one cent for depreciation damages."
No. 5 " "Cough up a cent for profit, taxes, material, etc."

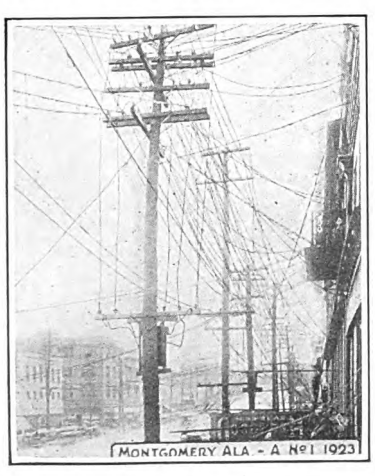
If you could talk at all, your remarks would be eloquent.

Yet, when you come to think of it, would that be any more ridiculous than for the street railway, the electric light company, the telephone company, and a couple of telegraph companies having and maintaining separate lines of poles on the same streets when one or two lines would look better and save a lot of money?

Elreco Steel Combination Railway and Lighting Poles are made for just such purpose. Wherever they are installed on this plan, the improved appearance of curb lines, the saving in cost for all concerned, and reduction of pole maintenance pleases everybody.

Moreover such installations are in line with the modernization of equipment which street railways all over the country are finding both desirable and profitable.

We have some interesting facts on how utilities in many cities have put over this money saving co-operation—write for them.



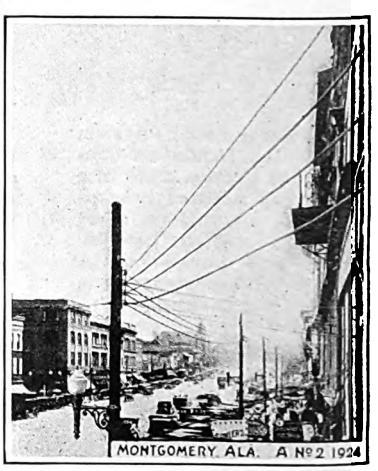
BEFORE

ELRECO
POLES

The Electric Railway Equipment Company

CINCINNATI, O.

New York Office: 30 Church St.



AFTER

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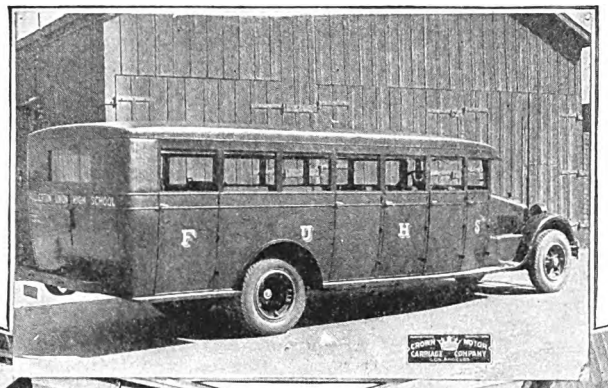
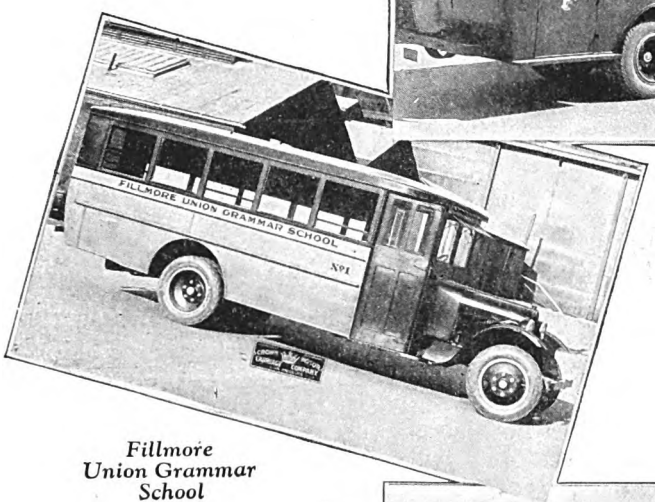
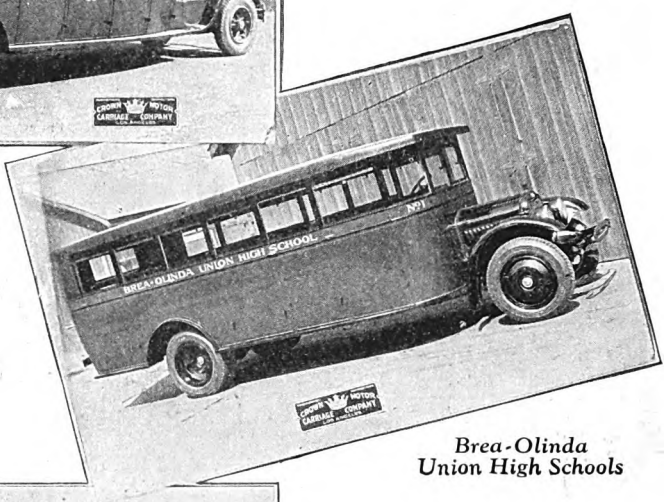


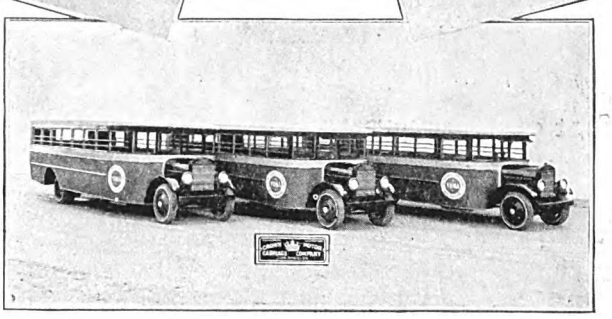
Fullerton Union High School



Fillmore Union Grammar School



Brea-Olinda Union High Schools



Yuma Union High School

Western School Buses With PLYMETL Sides

THE experience gained in nearly a quarter century devoted to the development of the finest commercial and bus bodies has led the Crown Motor Carriage Company, Inc., Los Angeles, California, to standardize upon and recommend PLYMETL for school bus bodies. A few of the typical jobs turned out by this company are shown in the illustrations.

Such bodies have the big advantage of economy in operation on account of their light weight and are particularly valuable for school use on account of the high factor of safety provided in these strong, impact-resisting side panels.

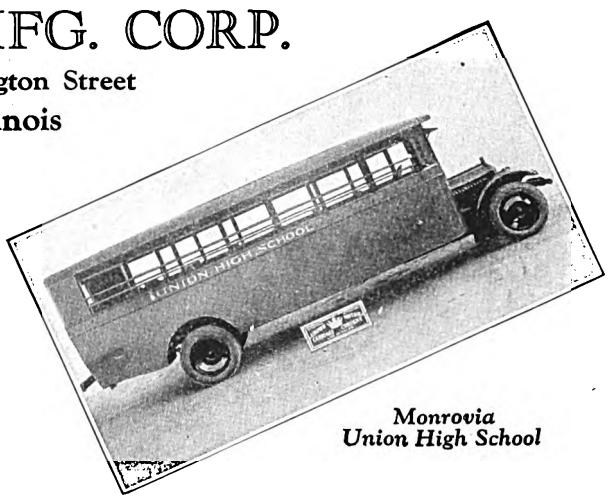
Detailed descriptions and list of users will be sent to anyone interested.

HASKELITE MFG. CORP.

133 West Washington Street

Chicago, Illinois

Arroyo Grande Union High School



Monrovia Union High School

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Nation-Wide Triumph

Studebaker leadership established within a year—Studebaker Bus routes link the nation, covering the country from coast to coast and penetrating every state in the Union.

AS the map shows, Studebaker Busses are in operation in practically every section of the United States. Note the Studebaker routes outlined . . . connecting principal cities from coast to coast, from Canada to Gulf . . . serving hundreds of communities over all kinds of roads . . . across desert sand in New Mexico, over mountain grades in Montana, through clinging gumbo as well as over the splendid modern boulevard . . . everywhere providing comfortable, dependable transportation *at a higher profit to the operator.*

Increased profit through low first cost, low operating cost and low depreciation . . . this explains Studebaker leadership.

Low First Cost: Due to standardized design and large-scale production, the first cost of the medium-capacity Studebaker Bus, complete with body, is practically half the cost of the large-capacity bus. This effects a saving of from $2,000 to $4,000 per bus. It enables an operator to buy twice as many Studebaker busses for the same original outlay.

Low Operating Cost: Because the medium-size Studebaker Bus is 50% lower in weight than the average truck-type bus, its operating costs are much lower. Operators report an average operating cost of 7 to 9 cents per mile, against 16 to 17 cents per mile for the same items of operating expense on the average heavy truck-type bus.

Low Depreciation: As shown by the partial list at the right, there are scores of Studebaker Busses with records of over 100,000 miles . . . some 200,000 and even 300,000 miles. Thus, the low first cost of Studebaker equipment coupled with exceptionally long life cuts depreciation to a minimum.

Obviously, if you buy a bus of ample passenger capacity for half the price of the average bus . . . operate it at a lower cost per mile . . . and drive it over 100,000 miles, as records prove possible . . . you obtain a much higher profit per passenger mile. That is why the Studebaker Bus offers more for your money . . . yields a proved higher dollars-and-cents return on your investment.

These 100,000-Mile Studebaker Busses give proof of long, dependable service

Operators listed below and at the right have one or more Studebaker Busses which have traveled over 100,000 miles. This is a partial list, including only those Studebaker Busses which have been reported to the factory and are still in active service. There are hundreds more throughout the world, for the Studebaker Big Six passenger-car chassis—prior to the introduction of the specially designed Studebaker Bus chassis—was even then the choice of hundreds of bus operators.

	Miles Per Unit
R. J. Todd, Spearfish, S. D.	200,000
R. J. Todd, Spearfish, S. D.	100,000
Danville Terre Haute Limited Bus Co., Danville, Ill	150,000
H. A. Lippitt, Hamilton, Ill.	200,000
H. A. Lippitt, Hamilton, Ill.	185,000
Loyal J. Boyd, Salina, Kans.	140,000
Eastern Carolina Coach Co., Inc., Charlotte, N. C.	150,000
Eastern Carolina Coach Co., Inc., Charlotte, N. C.	125,000
Bellaire-Neff Bus Co., Bellaire, Ohio	132,000
Bellaire-Neff Bus Co., Bellaire, Ohio	157,000
Craig A. Shields, Adena, Ohio	227,000
Ohio Transit Co., Lancaster, Ohio	250,000
Ohio Transit Co., Lancaster, Ohio	110,000
Ohio Transit Co., Lancaster, Ohio	108,000
Ohio Transit Co., Lancaster, Ohio	100,000
R. A. MacCartney, Joplin, Mo.	125,000
Diamond Bus Co., Patton, Pa.	120,000
Clyde O. Hammond, New Lexington, Ohio	150,000
Clyde O. Hammond, New Lexington, Ohio	170,000
Clyde O. Hammond, New Lexington, Ohio	142,575
Adrian-Ann Arbor Motor Coach Co., Adrian, Mich.	120,000
J. W. Bilyen, Bedford, Ind.	110,000

STUDEBAKER BUS

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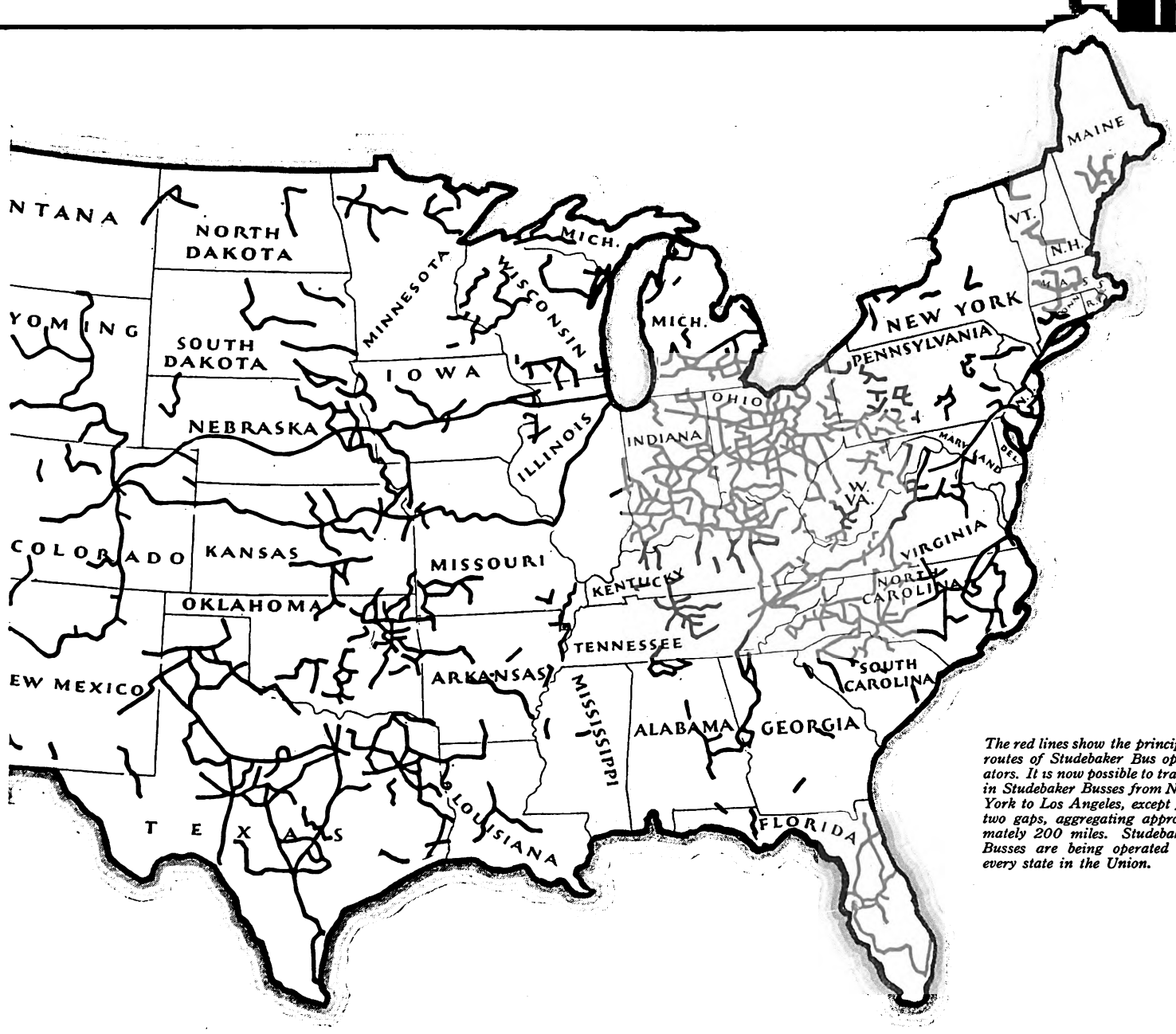
for Studebaker Busses



The red lines show the principal routes of Studebaker Bus operators. It is now possible to travel in Studebaker Busses from New York to Los Angeles, except for two gaps, aggregating approximately 200 miles. Studebaker Busses are being operated in every state in the Union.

	Miles Per Unit
Royal Blue Transportation Co., Greensboro, N. C.	150,000
Royal Blue Transportation Co., Greensboro, N. C.	125,000
Royal Blue Transportation Co., Greensboro, N. C.	100,000
Maag Bros. Transit Co., Marion, Ohio	225,000
Maag Bros. Transit Co., Marion, Ohio	165,000
Maag Bros. Transit Co., Marion, Ohio	165,000
Maag Bros. Transit Co., Marion, Ohio	100,000
Maag Bros. Transit Co., Marion, Ohio	125,000
Roy Hanenkratt, Glendale, Ariz.	150,000
C. F. King, Helena, Mont.	168,000
C. F. King, Helena, Mont.	175,340
Roy & Eddie Coleman, Springfield, Ohio	350,000
Fred Davis, Columbus, Ohio	250,000
Cannon Ball Trans. Co., Portsmouth, Ohio	150,000
Booth & Boatshick, Columbus, Ohio	150,000
R. J. West, Dayton, Ohio	250,000
Midland Trail Transit Co., Charleston, W. Va.	150,000
Wheeling-Cambridge, Cambridge, Ohio	200,000
Red Star Trans Co., Cambridge, Ohio	150,000
O. J. Daniels & Son, Parkersburg, W. Va.	125,000
R. G. Webb, Lexington, Ky.	300,000
Cincinnati-Hamilton Line, Cincinnati, Ohio	150,000
Cincinnati-Louisville Line, Cincinnati, Ohio	150,000
Baker & Watson, Zanesville, Ohio	150,000
Carl Fent, Xenia, Ohio	100,000
Maag Bros., Marion, Ohio	150,000
Red Star Trans. Co., Springfield, Ohio	125,000
King Bros., Dayton, Ohio	150,000
Pocahontas Trans. Co., Bluefield, W. Va.	150,000
Union Transfer Co., Murfreesboro, Tenn.	100,000
Union Transfer Co., Murfreesboro, Tenn.	100,000

	Miles Per Unit
W. C. Hadley, Joelton, Tenn.	100,000
H. H. Motor Line, Las Cruces, N. Mex.	147,563
H. H. Motor Line, Las Cruces, N. Mex.	128,472
Green Star Bus Line, Smithfield, Ohio	350,000
Green Star Bus Line, Smithfield, Ohio	400,000
Green Star Bus Line, Smithfield, Ohio	200,000
Green Star Bus Line, Smithfield, Ohio	150,000
Robert Mason, Utica, Ohio	110,000
The Wheeling, St. Clairsville & Cambridge Transportation Co., St. Clairsville, Ohio	200,000
The Wheeling, St. Clairsville & Cambridge Transportation Co., St. Clairsville, Ohio	125,000
The Wheeling, St. Clairsville & Cambridge Transportation Co., St. Clairsville, Ohio	100,000
The Wheeling, St. Clairsville & Cambridge Transportation Co., St. Clairsville, Ohio	150,000
Cambridge-Marietta Bus Line, Cambridge, O.	175,000
Cambridge-Marietta Bus Line, Cambridge, O.	175,000
Cambridge-Marietta Bus Line, Cambridge, O.	153,000
Cambridge-Marietta Bus Line, Marietta, O.	153,000
Cambridge-Marietta Bus Line, Marietta, O.	133,000
Cambridge-Marietta Bus Line, Marietta, O.	133,000
Cambridge-Marietta Bus Line, Marietta, O.	185,000
Cambridge-Marietta Bus Line, Marietta, O.	117,000
G. W. Angel, Franklin, N. C.	128,000
J. M. Tolbert, Newberry, S. C.	150,000
Larry Miller, Bemidji, Minn.	104,000
Lee Price, Columbia City, Ind.	150,000
W. F. Reynolds Bus Lines, Lexington, Ohio	160,000
Brown & Son, The Dalles, Ore.	190,000
Brown & Son, The Dalles, Ore.	175,000
Brown & Son, The Dalles, Ore.	155,000
Brown & Son, The Dalles, Ore.	150,000
Brown & Son, The Dalles, Ore.	125,000

	Miles Per Unit
Parrish Stage Line, Deming, N. Mex.	150,000
Parrish Stage Line, Deming, N. Mex.	115,000
Denver Steamboat Stage Co., Denver, Colo.	160,000
Denver Steamboat Stage Co., Denver, Colo.	125,000
Ed Blankenburg, Glendive, Mont.	125,000
Blue Bird Transit Co., Glendive, Mont.	150,000
Jud S. Skowten, Cheboygan, Mich.	174,000
Cannon Ball Transp. Co., Portsmouth, Ohio	193,000
Cannon Ball Transp. Co., Portsmouth, Ohio	193,000
Cannon Ball Transp. Co., Portsmouth, Ohio	193,000
Cannon Ball Transp. Co., Portsmouth, Ohio	165,000
Cannon Ball Transp. Co., Portsmouth, Ohio	165,000
Cannon Ball Transp. Co., Portsmouth, Ohio	165,000
Cannon Ball Transp. Co., Portsmouth, Ohio	120,000
Cannon Ball, S. V. Div., Portsmouth, Ohio	145,000
Cannon Ball, S. V. Div., Portsmouth, Ohio	145,000
Cannon Ball, S. V. Div., Portsmouth, Ohio	145,000
Cannon Ball, S. V. Div., Portsmouth, Ohio	115,000
Cannon Ball, S. V. Div., Portsmouth, Ohio	115,000

CHASSIS

Mail the Coupon for Free Book, "Profitable Bus Operation"

The Studebaker Corporation of America,
Dept. B South Bend, Ind.

Send me free "Profitable Bus Operation" without obligation.

Name.....

Address.....

City..... State.....

We have.....busses at present.

Check below the Studebaker Bus about which you desire information.

Type: Sedan.....Parlor Car.....Street-Car Type.....

Capacity:.....Passengers.

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PROFIT-SEEKING DEALERS WILL READ

THESE 7 IMPORTANT STATEMENTS

ABOUT THE LEADING
HEAVY DUTY TIRE
ON THE MARKET

THE CENTURY BUS SPECIAL

(1) A brand new principle in the construction of a heavy duty bus tire.

(2) Tire retains same shape when inflated and giving service as before mounting on rim.

(3) Special material used in construction.

(4) Because of and we guarantee greater mileage than any other bus tire now on the market.

(5) This improved heavy duty tire will greatly reduce mileage cost.

(6) Make us prove the truth of the above statements.

(7) Write today for complete information.

CENTURY RUBBER WORKS

54TH AVENUE AND WEST 18TH STREET, CHICAGO, ILLINOIS

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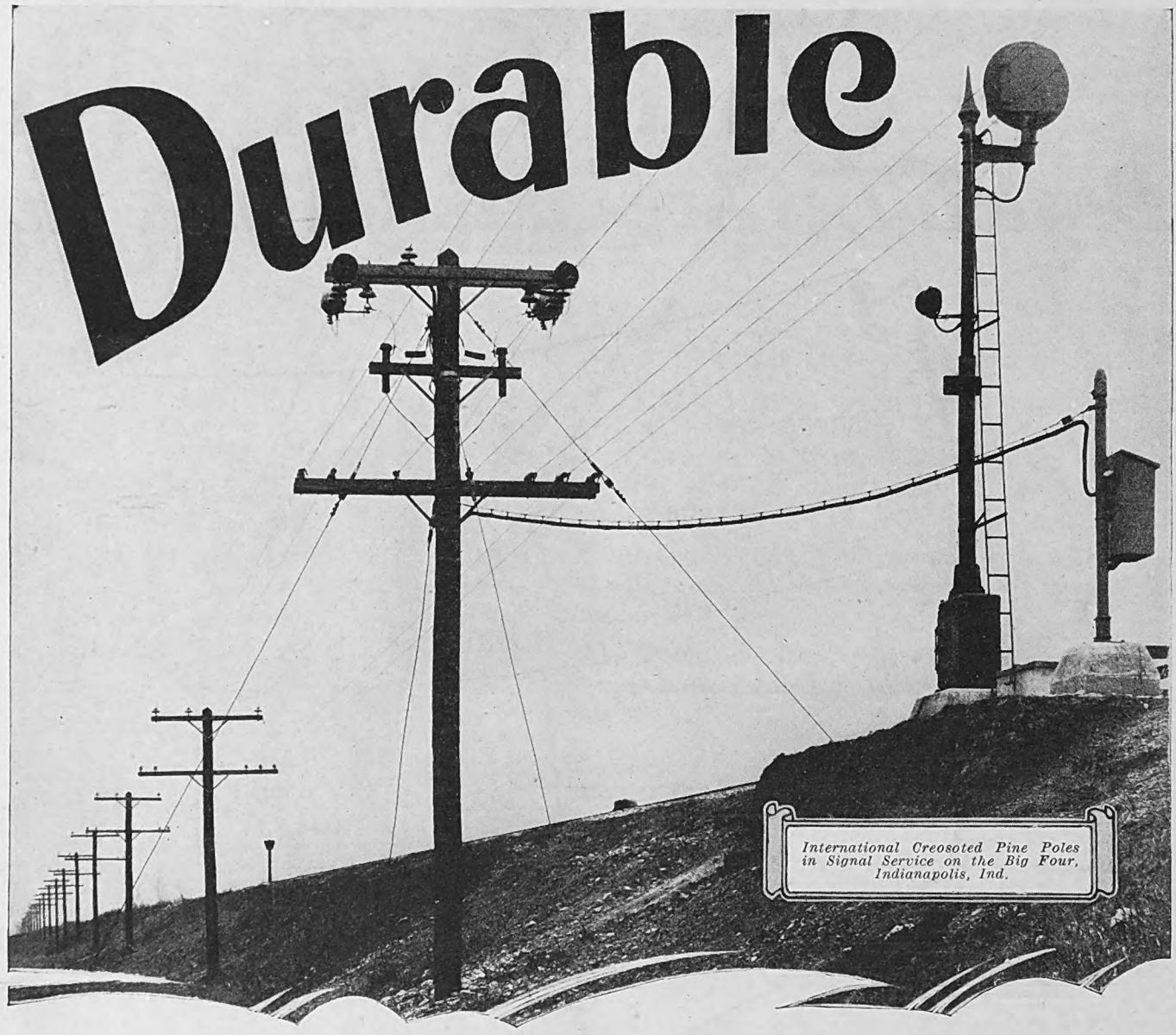
Durable



International Creosoted Pine Poles in Signal Service on the Big Four, Indianapolis, Ind.

INTERNATIONAL Creosoted Pine Poles like those illustrated, have been in service 25 years and their condition indicates they are good for many more years.

Leading public utility organizations, as the result of long experience with poles, attribute a life of more than 25 years to creosoted pine, and know that the service the year round is dependable.

It is sound economy to buy ***International*** Creosoted Pine Poles — their remarkable durability insures long life, lower maintenance, minimum replacements and added years of reliable service.

International Creosoting & Construction Co.
General Office—Galveston, Texas

International
CREOSOTED YELLOW PINE POLES

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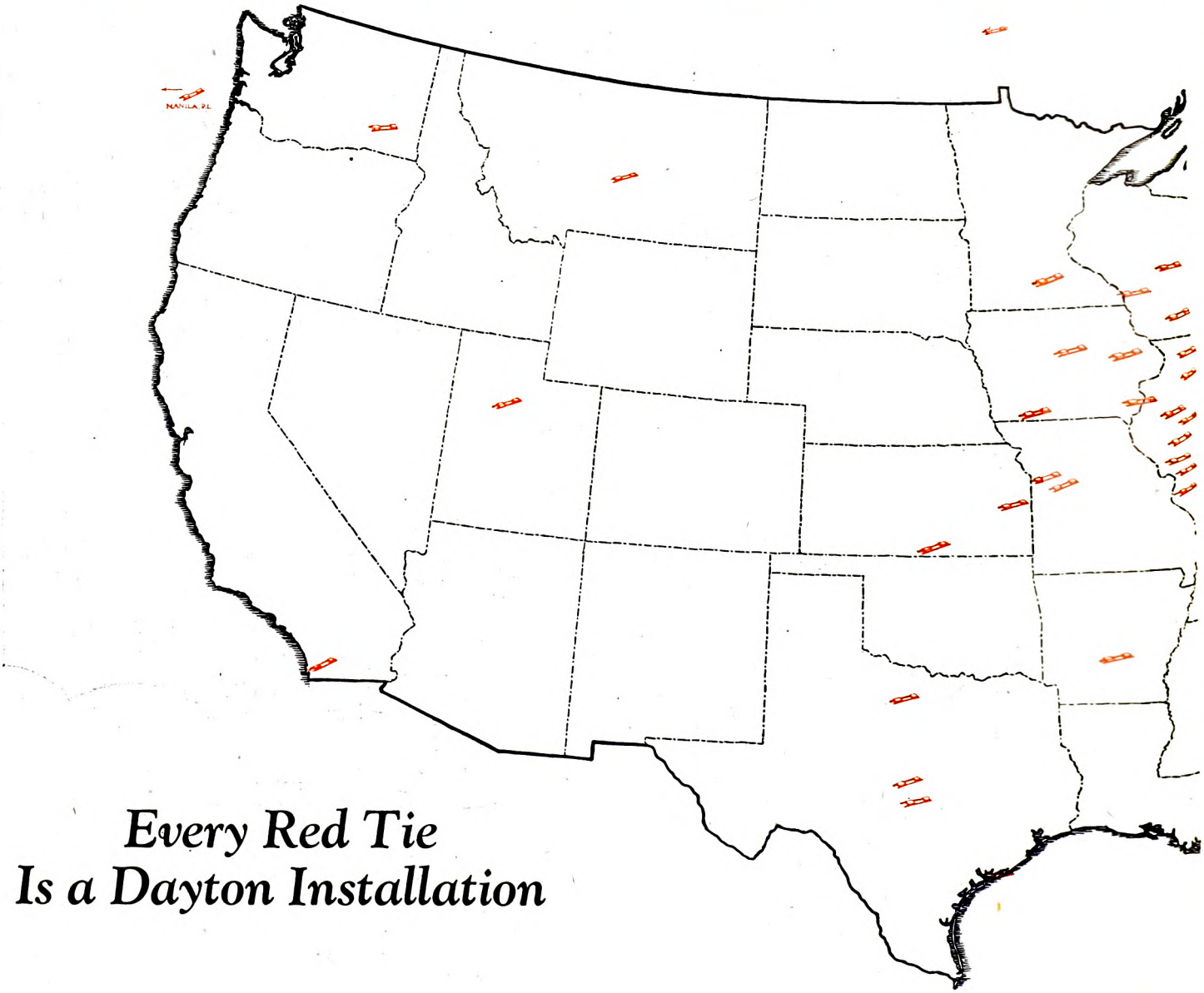
All Over The

Dayton Ties Are Cutting Track And



Every Red Tie
Is a Dayton Installation

The Dayton

Dayton,

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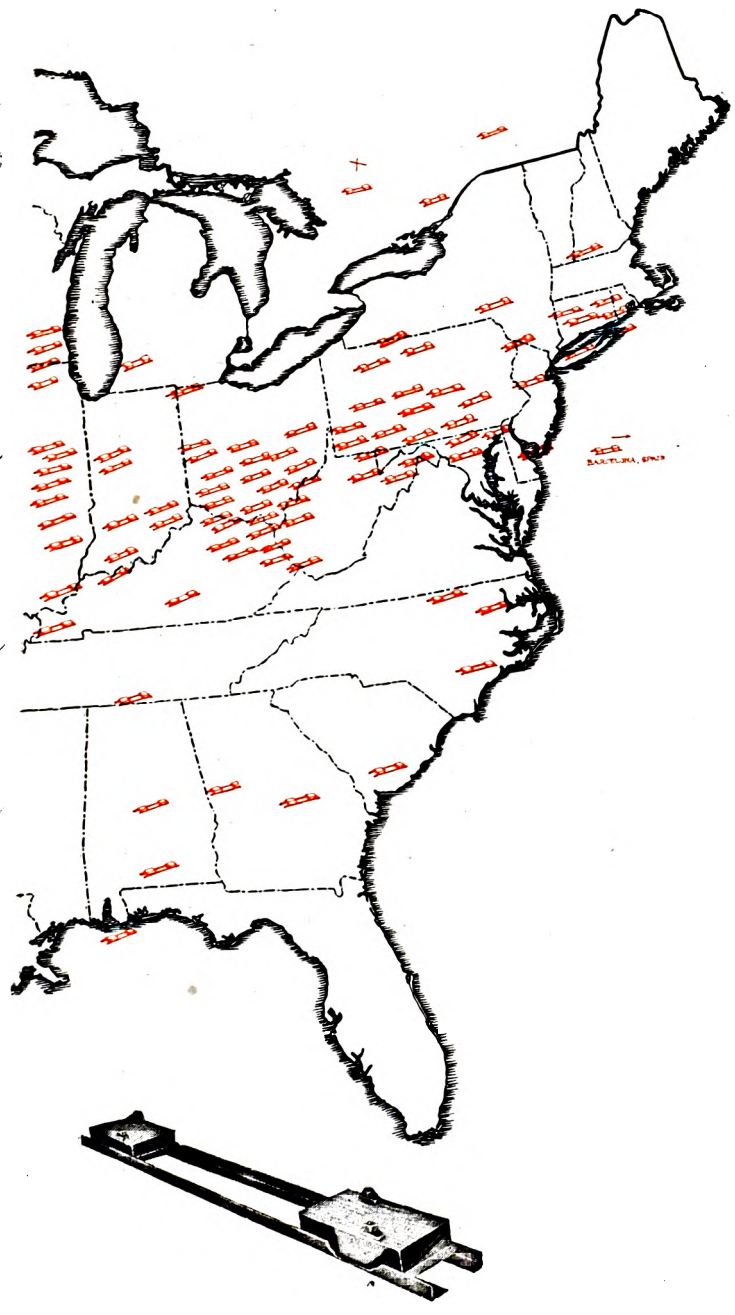
Nation
Rolling Stock Maintenance Costs



Each little red tie on this map indicates a street railway that uses Dayton Mechanical Ties.

All over the nation, Dayton Ties through inbuilt resilience and durability are reducing maintenance by one half, practically wiping out track repairs, allowing bigger earnings, and bettering public relations.

When track is laid on them, 10 years' severe service leaves it smooth—almost as good as new—ready for another 10.

Small wonder, then, that as users expand their lines, they order and re-order more and more Daytons.

Investigate Dayton Ties—they give you permanently smoother street railway track. First cost is less than for wood tie construction. *Send for complete information.*

The Dayton Mechanical Tie Co.
Dayton, Ohio

Why Dayton Ties Are Better

It is a peculiarity of concrete that it will stand enormous pressure loads, but breaks up at once under pounding.

Dayton Mechanical Ties provide a cushioning resilience which absorbs the pounding shock of wheels, so that pressure only, is transmitted to the concrete.

Thus, the concrete lasts indefinitely, and as constant shocks also wear out rolling stock, Dayton Ties will decrease such repairs by one half.

A Dayton Tie consists of two steel pans, or boxes, separated by angle irons. The angle irons preserve the gauge, and re-enforce the concrete ballast.

In the bottom of each pan is a layer of highest grade of asphalt. A selected, thoroughly seasoned white oak block rests on the asphalt, confining it to the pan.

It is this combination of oak and confined asphalt which gives the correct degree of resilience.

Mechanical Tie Co.,
Ohio

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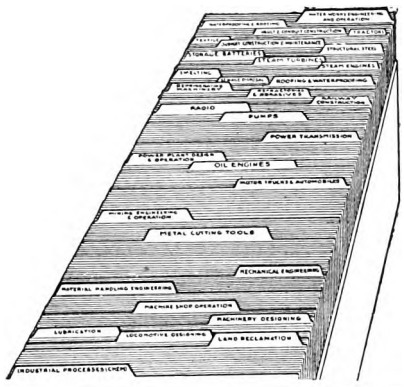
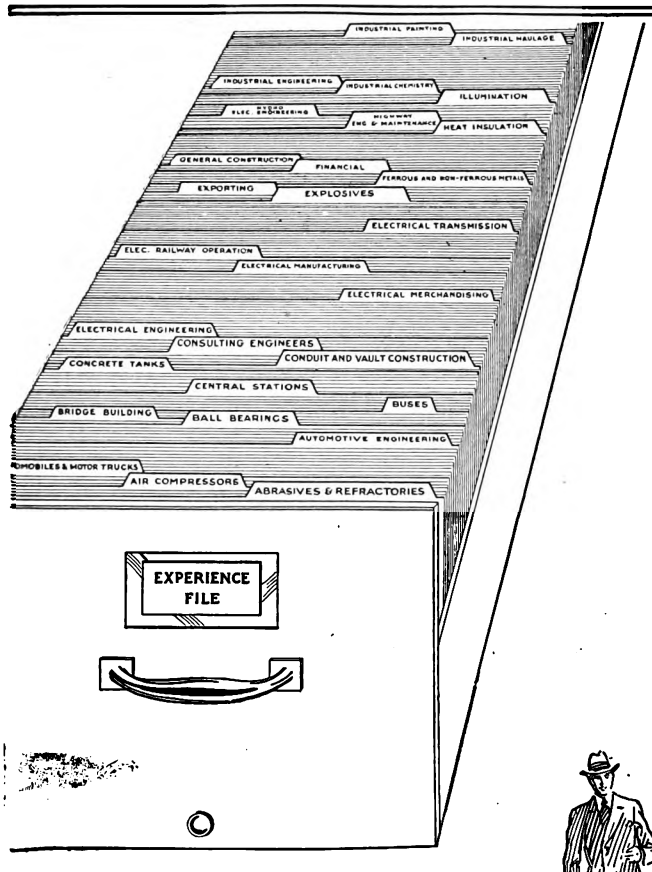


Knowledge of your industry



A Few Facts From The Experience Index

Going through the McGraw-Hill experience file at random you will find such facts as these:

5 McGraw-Hill men formerly in automotive engineering.

8 McGraw-Hill men formerly in material-handling engineering.

2 McGraw-Hill men formerly in subway construction.

12 McGraw-Hill men formerly with process (chemical) industries.

9 McGraw-Hill men formerly in electrical merchandising.

4 McGraw-Hill men formerly consulting engineers.

16 McGraw-Hill men formerly with central stations.

9 McGraw-Hill men formerly with electric railways.

6 McGraw-Hill men formerly machinery designers.

And so on.

From shop and mine, from factory and generating station, from chemical laboratory and construction job, from jobber and dealer, have come the men who make the McGraw-Hill organization. Production men, operating experts, specialists in selling from many industries have come to develop the McGraw-Hill Publications as authorities in industry..... authorities, first, to their subscribers, the creators and builders of industry.....authorities, next, to the men who are selling to industry.

As editors, department heads, service men, marketing counselors and field representatives, these men have become essential units in the McGraw-Hill organization, absorbing its purpose and spirit and devoting their fine attainments to carrying forward its tradition of over a half-century's service to industry.

The experience of these men has been cataloged, classified and filed for instant reference. That file is the nerve center of the organization. Thumb over the index tabs and it will be strange if you do not find a man, or twenty men, who have a working knowledge of the industry to which you sell, or the equipment which you make.

For more than fifty years the McGraw-Hill Company has known industrial America. Its contacts have been inside contacts; its fund of experience is the composite gained in shop, factory and field.

Through this intimate knowledge and constant contact, McGraw-Hill seven years ago sensed the step that industry is now taking in applying to its selling the same science and caution that have advanced industrial production and reduced costs. The service of McGraw-Hill Publications was extended to embrace not only the publishing of technical information on production and engineering but counsel on scientific, waste-free selling. This counsel is epitomized in the following McGraw-Hill Four Principles of Industrial Marketing which today are bringing country-wide endorsement from industry, bank, advertising agency and university.

MARKET DETERMINATION—An analysis of markets or related buying groups to determine the

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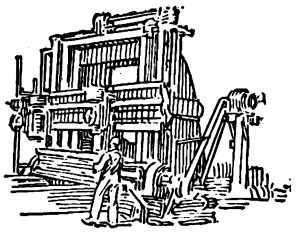
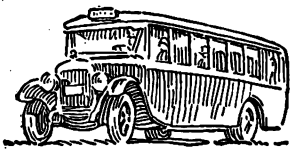
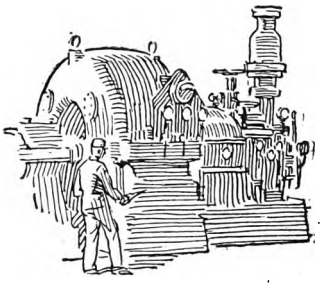
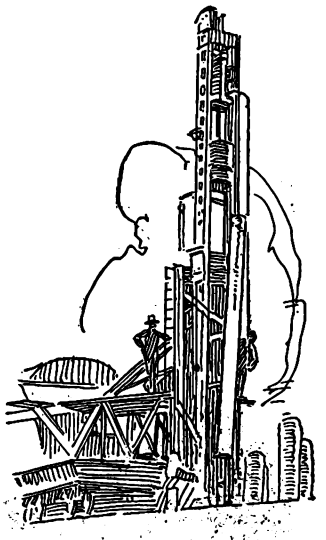






is here!



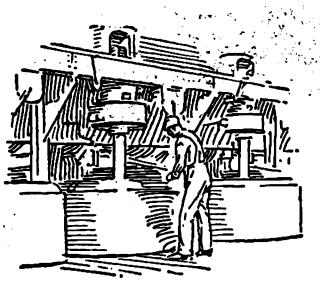
potential of each. With a dependable appraisal of each market, selling effort can be directed according to each market's importance.

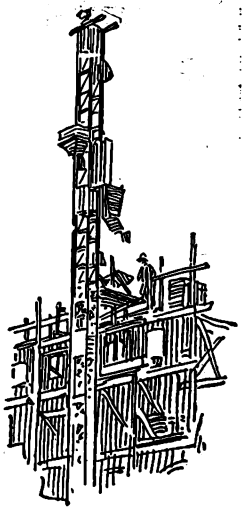
BUYING HABITS—A study of the selected market groups to determine which men in each industry are the controlling buying factors and what policies regulate their buying. Definite knowledge eliminates costly waste in sales effort.

CHANNELS OF APPROACH—The authoritative publications through which industries keep in touch with developments are the logical channels through which to approach the buyer. In a balanced program of sales promotion these publications should be used effectively and their use supplemented by a manufacturer's own literature and exhibits.

APPEALS THAT INFLUENCE—Determining the appeals that will present the product to the prospective buyer in terms of his own self-interest or needs.

These Four Principles are more than a formula. They are a method, repeatedly tested by practical application, backed by a half-century of intimate acquaintance with industry. Any manufacturer selling to industry can apply them to advantage in his own marketing program. Our Marketing Counselors will be glad to lay the details before you or your advertising agent. A conference can be arranged by communicating with our nearest office.





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RADIO
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(COAL EDITION) (METAL-QUARRY EDITION)
COAL CATALOG CENTRAL STATION DIRECTORY
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ANALYSIS OF METALLIC AND NON-METALLIC
MINING, QUARRYING AND CEMENT INDUSTRIES

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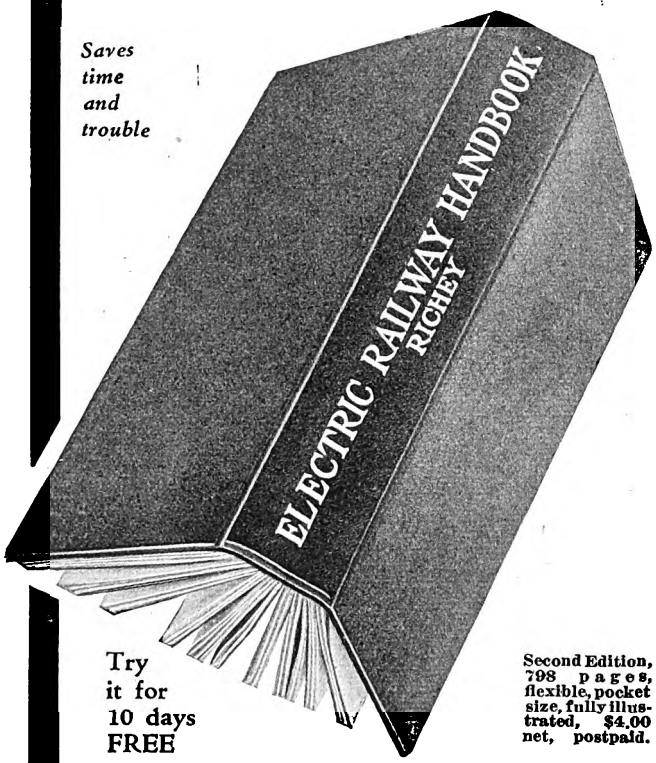
Right on your desk
—just the data you want

Electric railway executives, engineers and operating men have long respected Richey's ELECTRIC RAILWAY HANDBOOK as the one great pocketbook of practice data, formulas and tables in the electric railway field.

The second edition of Richey covers the latest developments—describes new methods—records changes in theory and practice. It covers every phase of electric railway work from Roadbed and Track to Signals and Communication.

Saves time and trouble



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This widely-known handbook is virtually an encyclopedia on modern electric railway organization, administration and operation.

It presents

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(2) Material of service to the non-technical manager or operator.
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Information every electric railway man needs—the latest and best methods—changes in practice and theory—that's the New Richey.

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Mail just this coupon

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FREE EXAMINATION COUPON

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You may send me on 10 days' approval Richey's Electric Railway Handbook, $4.00 net. I agree to pay for the book or return it postpaid within 10 days of receipt.

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Address .....

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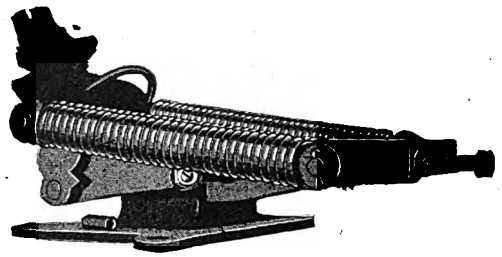
Nuttall



The new
Nuttall Form US 20A
Timken Roller Bearing Trolley Base

A really *new* trolley base, simplified and engineered to the same high standards of efficiency and low maintenance as the modern car motor. Incorporates the famous Timken Roller Bearing — a tapered double-race roller bearing designed by this manufacturer especially for trolley base service.

Profitably interesting features include extreme sensitiveness, with swiveling strains evenly distributed on bearings; oil and grease reservoirs for lubrication of bearings and pole socket axle pin respectively; quick, easy lubrication only once in six months.

Full specifications on request.

MEMBER AERA 1926

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

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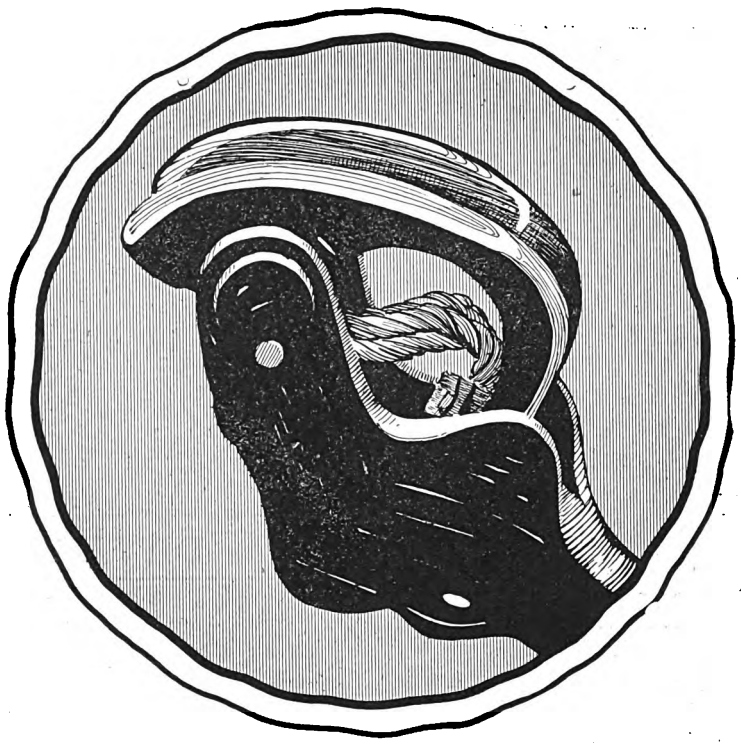

When you modernize be sure to Miller-ize

To consider these five points of superiority is to realize how well Miller Trolley Shoes fit into the industry's modernization movement.

1. Less wire wear. Full 3-inch sliding contact surface "hugs" the wire closer than any wheel—so that less trolley tension is required for absolutely safe operation.

2. Less shoe wear. Sliding contact of shoe lasts longer than wheel because there are no bearings to wear out and only a few moving parts.

3. No lubrication. The absence of rotating parts eliminates the time and labor required to oil the bearing of the trolley wheel.

4. No arcing. Constant contact prevents the pits and burns that are found in the ordinary trolley and contact device.

5. Ample current capacity. Sliding contact handles heavier current drafts than trolley wheels—and always insures steady power for motors and lights.

To provide you with further proof of Miller Trolley Shoe ability, we will gladly co-operate for a trial under your own conditions.

Miller Trolley Shoe Company

295 Columbia Road, Boston 21, Mass.

MILLER TROLLEY SHOES

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You're having brush trouble

CORRECT IT

USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron
Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.
Pittsburgh Office: 634 Wabash Bldg.
Chicago Office: 1657 Monadnock Block
San Francisco Office: 525 Market Street
Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal and Toronto

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F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

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Garland Ventilators
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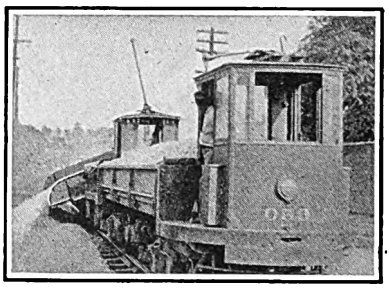
Ft. Pitt Spring & Mfg. Co., Springs
Flaxlinum Insulation
Anderson Slack Adjusters
Economy Electric Devices Co., Power Saving and Inspection Meters
Yellow Coach Mfg. Company—Single and Double-deck Buses

***The* DIFFERENTIAL CAR**



Standard on 60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

Instantaneous Registration by the Passenger

ROOKE SYSTEM of fare collection—

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register *portable* or *stationary, at* option. Handles nickels, dimes, quarters, or metal tickets, in *any combination,* FLEXIBILITY with CERTAINTY.

Rooke Automatic Register Company Providence, R. I.

Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.

THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

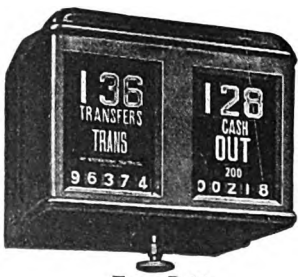
TULC
A LUBRICANT

We make a specialty of

ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULC on your equipment

The Universal Lubricating Co.
Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company, Straus Bldg.



Type R-11
Double Register

International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

The International Register Co.
15 South Throop Street, Chicago, Illinois

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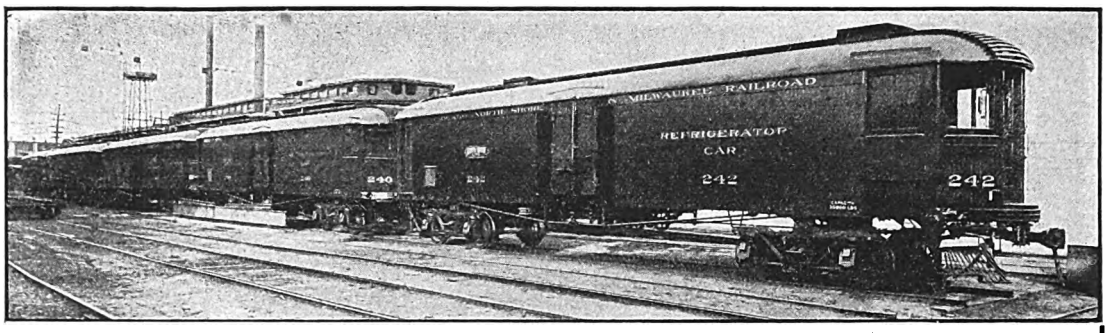
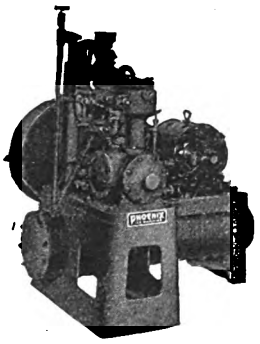


CHICAGO, NORTH SHORE & MILWAUKEE R.R.



Phoenix Transportation Refrigerating Unit.

THESE five Phoenix Electric Refrigerator Cars, built by The Cincinnati Car Co., were put into service this past Spring.

The Chicago, North Shore & Milwaukee R.R. had realized for some time the possibilities for service and profit in refrigerator cars. Ice refrigerator cars could not be used because the drippings from melting ice would not be tolerated on the elevated tracks in Chicago.

The Company consulted as a matter of course The Phoenix Ice Machine Co., the only builders who have successfully adapted mechanical refrigeration for electric railway use.

The initial cost of a Phoenix Electric Refrigerator Car is slightly higher than that of an ice refrigerator car, but its productivity is several times as much, so that a Phoenix Electric is by far the cheapest refrigerator car made.

Standard freight and express cars can be readily converted into highly efficient Phoenix Electric Refrigerator Cars.

Write for descriptive literature.

The Phoenix Ice Machine Co.
Cleveland, Ohio

PHOENIX ICE MACHINE

88% use "Tool Steel" gears

Questionnaire Replies

THE 1925 A. E. R. A. Equipment Committee sent out a questionnaire on spur and helical gearing. To this questionnaire there were 18 companies replied who controlled a total of 14,910 cars. The lineup of these companies on "Tool Steel" is as follows:

Exclusive Users—9 companies controlling 7943 cars.....53%	88%
Part Users—6 companies controlling 5138 cars.....35%	
Non-Users—3 companies controlling 1829 cars.....12%	

As you analyze the 1925 Equipment Committee report on the gear subject bear in mind that the basis information was obtained from companies where 88% of the cars were controlled by those who used "Tool Steel" gears and pinions, either exclusively or regularly.

The Tool Steel Gear & Pinion Co.,
Cincinnati, Ohio

TOOL-STEEL QUALITY GEARS AND PINIONS
The Standard of Quality

PANTASOTE

Trade Mark

Seat and Curtain Materials

There is no substitute for Pantasote

AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting

The only homogeneous panel board

standard for electric railway cars and motor buses

The PANTASOTE COMPANY Inc.
At 46th St. 250 Park Avenue
NEW YORK

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AMERICAN BRIDGE COMPANY

EMPIRE BUILDING—71 BROADWAY NEW YORK, N. Y.

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS

ALSO STEEL BARGES FOR HARBORS AND RIVERS, STEEL TOWERS FOR ELECTRIC TRANSMISSION, HEROULT ELECTRIC FURNACES, ETC.

SALES OFFICES:

NEW YORK, N.Y. — Philadelphia, Pa. · Boston, Mass. · Baltimore, Md.

PITTSBURGH, PA. — Cincinnati, Ohio · Cleveland, Ohio · Detroit, Mich.

CHICAGO, ILL. — St. Louis, Mo. · Denver, Colo. · Salt Lake City, Utah · Duluth, Minn. · Minneapolis, Minn.

Pacific Coast Representative: U. S. Steel Products Co., Pacific Coast Dept. — San Francisco, Cal. · Los Angeles, Cal. · Portland, Ore. · Seattle, Wash.

Export Representative: United States Steel Products Co., 30 Church Street, New York.

Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Alloy Steel Crossings; Abbott and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates and Pole Line Material.

Catalog Sent on Request

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

BETHLEHEM

Wharton Special Trackwork

Trackwork of superior quality, incorporating the famous Tisco Manganese Steel.

WM. WHARTON JR. & CO., Inc.
EASTON, PA.

OFFICES:

Boston · Philadelphia · Chicago · Pittsburgh · El Paso · San Francisco · Montreal · New York · Scranton

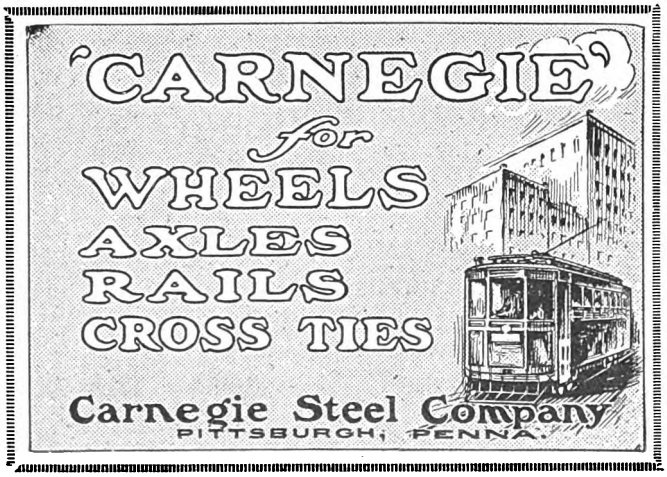
Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago · New York · Boston · Cleveland · Pittsburgh · Denver · U. S. Steel Products Co. · San Francisco · Los Angeles · Portland · Seattle



Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY
Johnstown, Pa.

Sales Offices:
Atlanta · Chicago · Cleveland · New York · Philadelphia · Pittsburgh · Dallas

Pacific Coast Representative:
United States Steel Products Company
Los Angeles · Portland · San Francisco · Seattle

Export Representative:
United States Steel Products Company, New York, N. Y.

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SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

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Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

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"SEARCHLIGHT"
IS
Opportunity
Advertising

—to help you get what you want.

—to help you sell what you no longer need.

Take Advantage Of It

For Every Business Want

"Think SEARCHLIGHT First"

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POSITIONS WANTED

EXPERIENCED operator of electric railways and bus lines, co-ordinated and separate, immediately available to serve as manager, superintendent, publicity, public relations manager or in any official position pertaining to railway or bus operation. At present manager of large railway properties. PW-916, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITION wanted as inspection or shop foreman, 10 years as armature winder, motor repairman, and acting inspection foreman, will guarantee good results. PW-914, Electric Railway Journal, 1600 Arch St., Phila., Pa.

SUPERINTENDENT transportation. With a wide experience and successful record on city and interurban properties also co-ordination of rail and bus service, successful in handling labor, public relations, etc. Recognized as a transportation official of exceptional ability fully capable of getting results on any property. At present engaged. Personal reasons for desiring change. Best of references. Correspondence invited. Address PW-915, Electric Railway Journal, Guardian Building, Cleveland, Ohio.

Rotary Converters

1—500 kw., 600-v., 833 amp., 900 r.p.m., 6-ph., compound wound Westinghouse Rotary Converter, with 3—165 kva., 60-cy., single ph., 13200 v. primary transformers with A.C. and D.C. panels.

1—300 kw., 600-v., 500 amp., 1200 r.p.m., 6-ph., compound wound interpole Westinghouse Rotary Converter, with 3—110 kva., 60-cy., single ph., 13200-v. primary transformers with A.C. and D.C. panels.

GEO. SACHSENMAIER CO.
926 N. Third St., Philadelphia, Pa.

FOR SALE
30 Birney Safety Cars
Brill Built
West. 508 or G. E. 264 Motors. Cars Complete—Low Price—Fine Condition.

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

If there is anything you want—

or something you don't want that *other* readers of this paper can supply—or use—advertise in the

SEARCHLIGHT SECTION

Somebody is always looking for something to meet certain business needs. Some men in charge of plant operations may be in the market for good used equipment—others may have just what they want, to sell. Some may require a man of unusual qualifications for a particular position—that man may be another reader of this paper!

Put the Searchlight Section to work for you under any of the following classifications—to fill your business needs.

Agencies Wanted
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Buildings For Sale
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Civil Service Opportunities
Contracts To Be Let
Contracts Wanted
Educational Courses
Employment Agencies
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For Rent Items
Franchises
Industrial Sites
Miscellaneous Wants
New Industries Wanted
Partners Wanted
Patents For Sale
Patent Attorneys
Plants For Sale
Positions Vacant
Positions Wanted
Property For Sale
Receivers' Sales
Representatives Wanted
Salesmen Wanted
Work Wanted
Etc., Etc., Etc.

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WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising Agencies
Doyle Kitchen & McCormick

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Air Springs
Cleveland Pneumatic Tool Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Illinois Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Front
Shuler Axle Co.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.
Ludlum Steel Co.

Babbit Metal
Johnson & Co., J. R.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Barges, Steel
American Bridge Co.

Batteries, Dry
Nichols Lintern Co.

Bearings and Bearing Metals
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Stucki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Cummings Car & Coach Co.
Graham Bros.

Body Material, Haskelite and Plymetl
Haskelite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Brill Co., The J. G.

Brakes, Brake Systems and Brake Parts
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Westinghouse E. & M. Co.

Buildings, Steel
American Bridge Co.

Bulkheads
Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Bus Seats
Hale-Kilburn Co.

Buses, Motor
Brill Co., The J. G.
Cummings Car & Coach Co.
International Motor Co.
Mack Trucks, Inc.
Studebaker Corp.
Yellow Truck & Coach Mfg. Co.

Bushings, Case Hardened and Manganese
Brill Co., The J. G.

Cables. (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.

Cars, Gas, Rail
Brill Co., The J. G.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Wm. Wharton, Jr. & Co.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskelite Mfg. Corp.
Pantasote Co., Inc.

Ceilings, Plywood, Panels
Haskelite Mfg. Corp.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

Coil Banding and Winding Machines
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condensor Papers
Irvington Varnish & Ins. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers
Amer. Brown Boveri Elec. Corp.

Controllers or Parts
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
Amer. Brown Boveri Elec. Corp.
General Electric Co.
Westinghouse E. & M. Co.

Conveying & Hoisting Machinery
American Bridge Co.

Copper Wire
American Brass Co.
Amer. Steel & Wire Co.
Anaconda Copper Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
American Steel & Wire Co
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
Amer. Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebling's Sons Co., John A.
Samson Cordage Works

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes, Hoists & Lifts
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantasote Co., Inc.

Dealer's Machinery & Second Hand Equipment
Elec. Equipment Co
Sachsenmaier Co., George

Dealer Second Hand Rails
Electric Equipment Co.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heating Co.
Nat'l Pneumatic Co., Inc.

Doors & Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale-Kilburn Co.
Morton Mfg. Co.

Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.

Drills, Track
Amer. Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Ears
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Trackwork Co.

Electric Transmission Towers
American Bridge Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.
John A. Roebling's Sons Co.

Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.

Engineers, Consulting, Contracting and Operating
Allison & Co., J. S.
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layng Corp.
Byllesby & Co., H. M.
Day & Zimmermann, Inc.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co

Exterior Side Panels
Haskelite Mfg. Corp.

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Cleveland Fare Box Co.
Nat'l Ry. Appliance Co.
Perey Mfg. Co.

Fare Registers
Electric Service Supplies Co

Fences, Woven Wire and Fence Posts
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

Flangeway Guards, Steel
W. S. Godwin Co., Inc.

Flaxlinum Insulators
National Railway Appliance Co.

Floodlights
Electric Service Supplies Co.

Floor, Sub
Haskelite Mfg. Corp

Floors
Haskelite Mfg. Corp.

Forgings
Brill Co., The J. G.
Carnegie Steel Co.

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co
Ohio Brass Co.
Westinghouse E. & M. Co.

Furnaces, Electric
Amer. Brown Boveri Elec. Corp.

Furnaces, Electric, Steel Melting
American Bridge Co.

Funnell Castings
Wm. Wharton, Jr. & Co.

Fuses and Fuse Boxes
Consolidated Car Heating Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.
Westinghouse E. & M. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.

Gauges, Oil and Water
Ohio Brass Co.

Gear Blanks
Bethlehem Steel Co.
Brill Co., The, J. G.
Carnegie Steel Co.

Gear Cases
Chillingworth Mfg. Co.
Electric Service Supplies Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bethlehem Steel Co.
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.

Generating Sets, Gas-Electric
General Electric Co.

Generators
Amer. Brown Boveri Elec. Corp.
General Electric Co.
Westinghouse E. & M. Co.

Girder Rails
Bethlehem Steel Co.
Lorain Steel Co.

Gongs (See Bells and Gongs)

Greases (See Lubricants)

Grinders & Grinding Supplies
Metal & Thermit Corp.
Railway Trackwork Co.

Grinders, Portable
Railway Trackwork Co.

Grinders, Portable Electric
Railway Trackwork Co.

Grinding Bricks and Wheels
Railway Trackwork Co.

Guard Rail Clamps
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Guards, Trolley
Elec. Service Supplies Co
Ohio Brass Co.

Harps, Trolley
Elec. Service Supplies Co
Nuttall Co., R. D.
Star Brass Works

Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Headlining
Haskelite Mfg. Corp.
Pantasote Co., Inc.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Traction Brake Co.

Instruments Measuring, Testing and Recording
Amer. Steel & Wire Co.
General Electric Co.
Westinghouse E. & M Co.

(Continued on page 52)

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85 LIBERTY STREET, NEW YORK

Builders since 1868 of Water Tube Boilers of continuing reliability

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CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
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PORTLAND, ORE., 805 Gasco Building

THE BABCOCK & WILCOX COMPANY — STEAM

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Bayonne, N. J.
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Makers of Steam Superheaters since 1898 and of Chain Grate Stokers since 1893

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NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
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LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, Porto Rico, Royal Bank Building

The Hardware makes the line Hubbard makes the Hardware

HUBBARD

Hubbard and COMPANY

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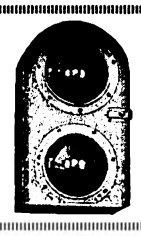

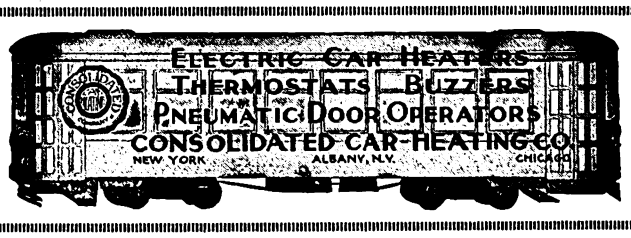

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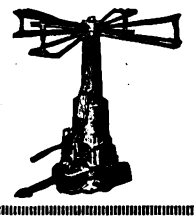

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(Continued on page 54)

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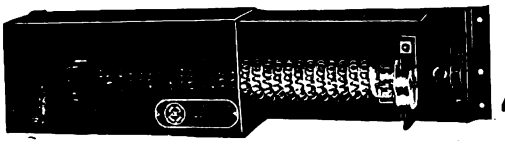

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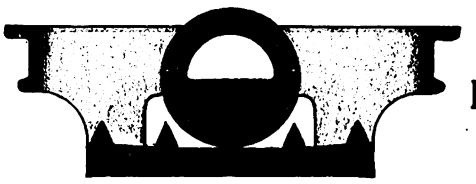

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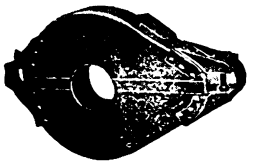

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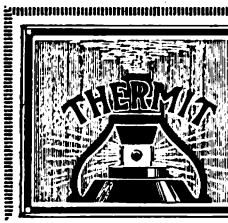

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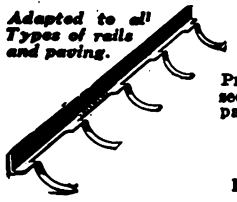

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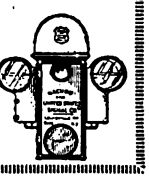

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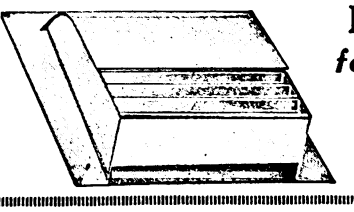

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ALPHABETICAL INDEX TO ADVERTISEMENTS

Page

A

Allison Co., J. E..... 25
American Brass Co., The..... 51
American Bridge Co..... 48
American Car Co..... 55
American Electrical Works..... 51
American Steel Foundries 8
American Steel & Wire Co.... 48
Anaconda Copper Mining Co... 51
Archbold-Brady Co. 24

B

Babcock & Wilcox Co..... 51
Beeler Organization 24
Bell Lumber Co..... 25
Bethlehem Steel Co..... 48
Bridgeport Brass Co..... 10
Brill Co., The J. G..... 55
Buchanan & Layng Corp..... 24
Byllesby Engineering & Management Corp. 24

C

Cameron Electrical Mfg. Co.... 25
Carey Company, The Philip..32-33
Carnegie Steel Co..... 48
Century Rubber Works....Insert 38
Chillingworth Mfg. Co..... 53
Cleveland Fare Box Co..... 53
Cleveland Pneumatic Tool Co., The 28
Cleveland Tanning Co..... 30
Collier, Inc., Barron G..Front Cover
Consolidated Car Fender Co.... 53
Consolidated Car Heating Co... 51
Cummings Car & Coach Co.... 21

D

Day & Zimmermann, Inc..... 24
Dayton Mechanical Tie Co....40-41
Differential Steel Car Co., The.. 46
Doyle, Kitchen & McCormick, Inc. 27

Page

E

Electric Equipment Co..... 49
Electric Ry. Equipment Co.... 34
Electric Railway Improvement Co., The..... 25
Electric Service Supplies Co.... 9

F

Ford, Bacon & Davis 24
"For Sale" Ads..... 49

G

General Electric Co..22, Back Cover
Godwin Co. Inc., W. S..... 53
Gold Car Heating & Ltg. Co.... 53
Goodyear Tire & Rubber Co., The 29

H

Hale-Kilburn Co..... 53
Haskelite Mfg. Corp.....Insert 35
"Help Wanted" Ads..... 49
Hemphill & Wells 24
Holst, Englehardt W..... 24
Hubbard & Co..... 51

I

Illinois Steel Co..... 20
International Creosoting & Construction Co..... 39
International Motor Co.....16-17
International Register Co..... 46
International Steel Tie Co., The. 7
Irvington Varnish & Insulator Co. 51

J

Jackson, Walter 24
Jeandron, W. J..... 46
Johnson & Co., Inc., J. R..... 25

Page

K

Kelker, DeLeuw & Co..... 24
Kelly-Springfield Tire Co..... 19
Kuhlman Car Co..... 55

L

LeCarbone Co..... 46
Lorain Steel Co..... 48
Ludlum Steel Co..... 48

M

Mack Trucks, Inc.....16-17
McClellan & Junkersfeld 24
McGraw-Hill Book Co., Inc.... 44
McGraw-Hill Publishing Co., Inc., 42-43
Metal & Thermit Corp..... 53
Miller Trolley Shoe Co..... 45
Morton Mfg. Co..... 53

N

Nachod and U. S. Signal Co... 53
National Brake Co..... 23
National Pneumatic Co., Inc... 15
National Ry. Appliance Co.... 46
Naugle Pole & Tie Co..... 25
Nichols-Lintern Co..... 53
Nuttall Co., R. D..... 44

O

Ohio Brass Co..... 5
Okonite-Callender Cable Company, Inc., The..... 51
Okonite Co., The..... 51

P

Pantasote Co., Inc..... 47
Perey Mfg. Co., Inc..... 51
Phoenix Ice Machine Co., The.. 47
Positions Wanted and Vacant.. 49

Page

R

Railway Track-work Co..... 4
Railway Utility Co..... 53
Ramapo Ajax Corp..... 53
Richey, Albert S..... 24
Roebling's Sons Co., John A... 25
Rooke Automatic Register Co.. 46

S

Sachsenmaier Co., George..... 49
Samson Cordage Works..... 53
Sanderson & Porter 24
Searchlight Section 49
Shuler Axle Co..... 25
Smith Heater Co., Peter..... 53
Star Brass Works..... 46
Stevens & Wood, Inc..... 24
Stone & Webster 24
Stucki Co., A..... 53
Studebaker Corporation of America, The.....Insert 36-37

T

Timken Roller Bearing Co., The. 31
Tool Steel Gear & Pinion Co... 47

U

Una Welding & Bonding Co.... 53
Universal Lubricating Co..... 46

W

"Want" Ads..... 49
Wason Mfg. Co..... 55
Westinghouse Elec. & Mfg. Co. 2
Westinghouse Traction Brake Co. 6
Wharton, Jr. & Co., Inc., Wm.. 48
"What and Where to Buy" 50-52-54
White Eng. Corp., The J. G.... 24
Wish Service, The P. Edw.... 25
Wood Co., Chas. N..... 51

Y

Yellow Truck Coach Mfg. Co., Insert 11-12-13-14

WHAT AND WHERE TO BUY

(Continued from page 52)

Ventilators, Car
Brill Co., The J. G.
Consolidated Car Heating Co.
Nat'l Ry. Appliance Co.
Nichols-Lintern Co.
Railway Utility Co.

Vestibule Linings
Haskelite Mfg. Corp.

Vitrified Brick
National Paving Brick Mfgrs. Assn.

Weatherproofing
Morton Mfg. Co.

Welded Rail Joints
Electric Railway Improvement Co.
Metal & Thermit Corp.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Welders, Portable Electric
Electric Railway Improvement Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Welders, Rail Joint
Ohio Brass Co.
Railway Trackwork Co.

Welding Processes and Apparatus
Electric Railway Improvement Co.
General Electric Co.
Metal & Thermit Corp.
Nat'l Ry. Appliance Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Welding Steel
Electric Railway Improvement Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Welding Wire
American Steel & Wire Co.
General Electric Co.
Railway Trackwork Co.
Roebling's Sons Co., J. A.

Welding Wire and Rods
Railway Trackwork Co.

Wheel Guards (See Fenders and Wheel Guards)

Wheel Presses (See Machine Tools)

Wheels, Car, Steel & Steel Tire
American Steel Foundries
Carnegie Steel Co.
Illinois Steel Co.

Wheels, Trolley
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Nuttall Co., R. D.
Star Brass Works

Wheels, Wrought Steel
Carnegie Steel Co.
Illinois Steel Co.
Ludlum Steel Co.

Whistles, Air
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
Westinghouse Traction Brake Co.

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Morton Mfg. Co.

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American Brass Co.
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Bird
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Franklin

Annual Statistical Number

ELECTRIC RAILWAY JOURNAL

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The sun never sets on

"Bridgeport" BRASS TRADE MARK CO.
Phono-Electric

See Advertisement inside
"From Tampa To Turkey"

Phono-Electric

BRIDGEPORT BRASS COMPANY, BRIDGEPORT, CONN.

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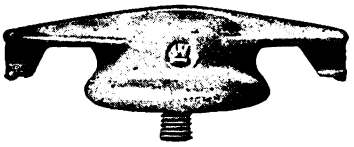
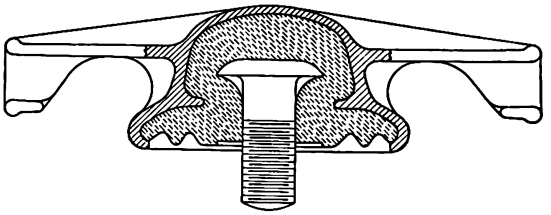
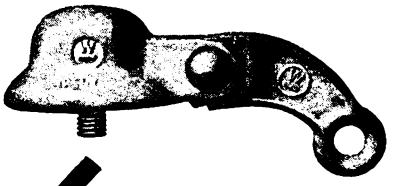
Suspensions



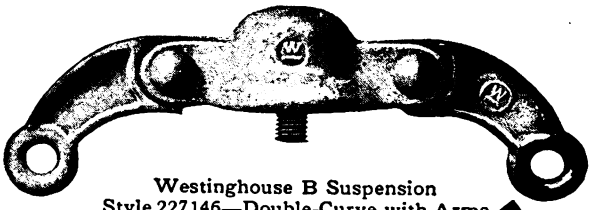
Westinghouse B Suspension
Styles 227032 and 227037
Straight Line



Showing method of holding stud
in body of B suspensions with
special insulating compound



Westinghouse B Suspension
Style 227144—Single-Curve with Arm



Westinghouse B Suspension
Style 227146—Double-Curve with Arms

Westinghouse B-1 Suspension
Style 300814, Straight-Line

Special Westinghouse Insulating Compound

holds the forged steel stud in the malleable iron body of Westinghouse B Suspensions.

The B-1 is identical with the B Straight-Line Suspension except that the stud is longer and is fitted with a lock washer held by a thin copper washer. This enables the trolley ear to be aligned accurately without "backing it off the stud," thereby always assuring a tight connection between the suspension and the ear. The lock washer will not become loose. The copper washer prevents the point of the lock washer from digging into the boss of the trolley ear, when removing the ear.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

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Pages 1-54

January 2, 1926

CONTENTS

Editorials 1

Railways Plan to Spend $296,000,000 for Plant and Material in 1926 5

Purchasing power of the industry shows healthy progress. An increase of 11.66 per cent over last year's figures is promised. Large track construction program is included in estimate submitted by the 57 operating companies furnishing information.

Fiction Has Nothing on These Facts! 7

BY G. J. MACMURRAY.

Suppose you went to the door to answer the bell and found a conductor instead of a cop, what would you say? A science of transportation is being developed. If you don't believe it you are out of touch with the events of the industry during 1925.

Issues of Merit Easy to Sell 13

Total financing in 1925 not large compared with recent years, but companies with good operating records experienced no difficulty in finding a market for their issues at reasonable rates. Need is imperative for recasting many financial structures.

Track Extensions Show Substantial Gain Over Previous Years 15

Electric railway mileage added during the past twelve months is larger than in any other year since 1918. Extensions to city and interurban trackage show increases over 1924. More than twice as much steam railroad mileage was electrified.

Car Purchases During 1925 Were Below Requirements 19

Reduction in the number of new cars ordered this year emphasizes the importance of directing increased attention to replacement of obsolete equipment. New England was the only section reporting increased purchases over last year.

34 per Cent of Passenger Cars Are Over Twenty Years Old 25

Less than half of all cars now in electric railway service were purchased in the last fifteen years. Greater number of new cars are needed to modernize industry than was anticipated. Nation-wide survey more than confirms previous estimates.

Heavy Traction Progress in 1925 28

Many projects completed, both in this country and abroad. Increasing attention is being paid to electric operation on trunk lines.

Bus Operation by Electric Railways Broke All Records in 1925 29

More companies inaugurated bus service during the past twelve months than in any previous year. The number of buses operated more than doubled. Purchases of new equipment were greater than ever before.

Electric Railway Costs and Fares Continue Stable in 1925 37

BY ALBERT S. RICHEY.

Only a few points variation has occurred in major index figures during the year. Discussion of trends indicates stability for coming year. Several changes in method of computing figures.

Receiverships Reduced in 1925 41

Fewer roads were thrown in receivership during the year, although the failure of one large property increased the mileage over that in 1924. Many roads restored to their owners, while others are on the way to terminate receivership early this year.

News of the Industry 44

Recent Bus Developments 47

Financial and Corporate 48

Personal Mention 50

Manufactures and the Markets 51

We Thank You!

ONCE more a new year is dawning. With it comes another Annual Statistical Number, with a wealth of information regarding the doings of electric railways in the past year, and a forecast of the one just begun. Collection of this material has been the main work of the editors ever since the October convention. The information this year is believed to be more complete, more accurate and more authoritative than ever before.

The editors alone could not have produced this issue. It has taken the assistance of practically every operating railway and holding company, and the manufacturers as well, to supply the information on which the tables, charts and text are based. Thousands of letters and hundreds of telegrams have been sent out and replies received in the process of collecting and verifying the data. Manifestly it is impossible to send acknowledgment in each individual case.

The data presented will be of inestimable value to the industry. We are glad to have been of service in preparing and publishing it. And we desire to thank publicly all who have assisted us in the preparation of this issue.

And to each one in the industry let us express the wish that for you it will be a happy and a prosperous New Year.

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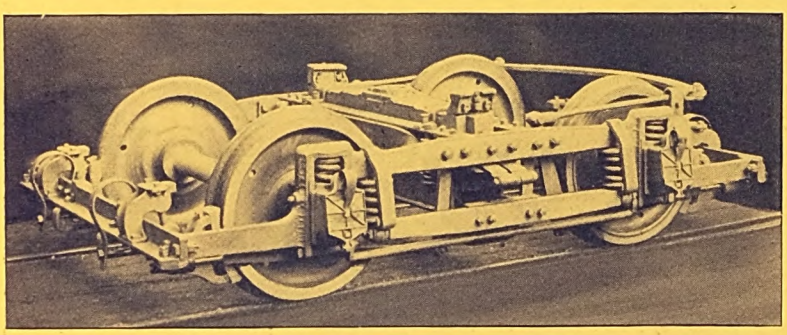
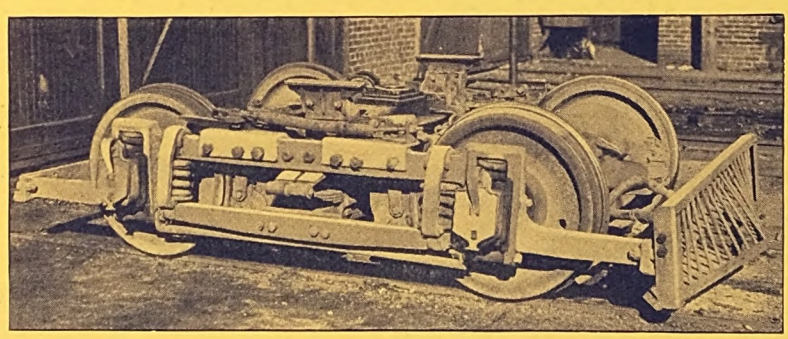
Lehigh Traction Keeps Step With Truck Improvements

1.



After nineteen years you wouldn't think it the same truck

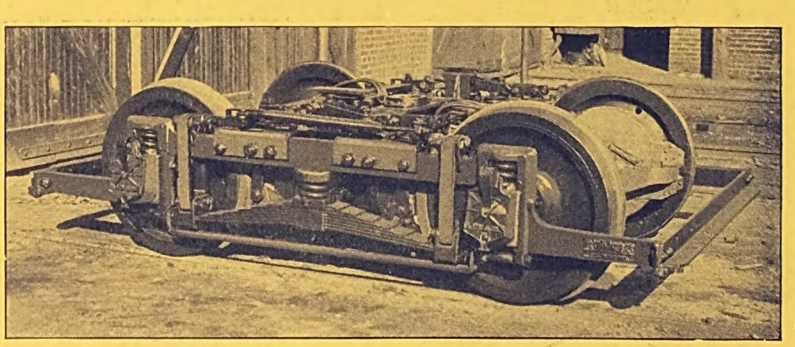
2.



The first step—

was taken two years ago after this Brill 27-E type truck had been in service 17 years. The brake rigging was changed to the inside-hung type with Brill Half-ball Brake Hangers, affecting a saving of 250 lb. per truck in weight.

3.



Reduces Truck Weight

700 lb. or 1400 lb. per car, besides modernizing truck equipment and improving service.

And now—

other improvements have just been completed, involving steel type bolster, Brill Bolster Guides, Semi-elliptic Springs and Brill Twin Links with the Brill Graduated Spring System in place of the full-elliptic type springs, resulting in an additional saving of 450 lb. per truck.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
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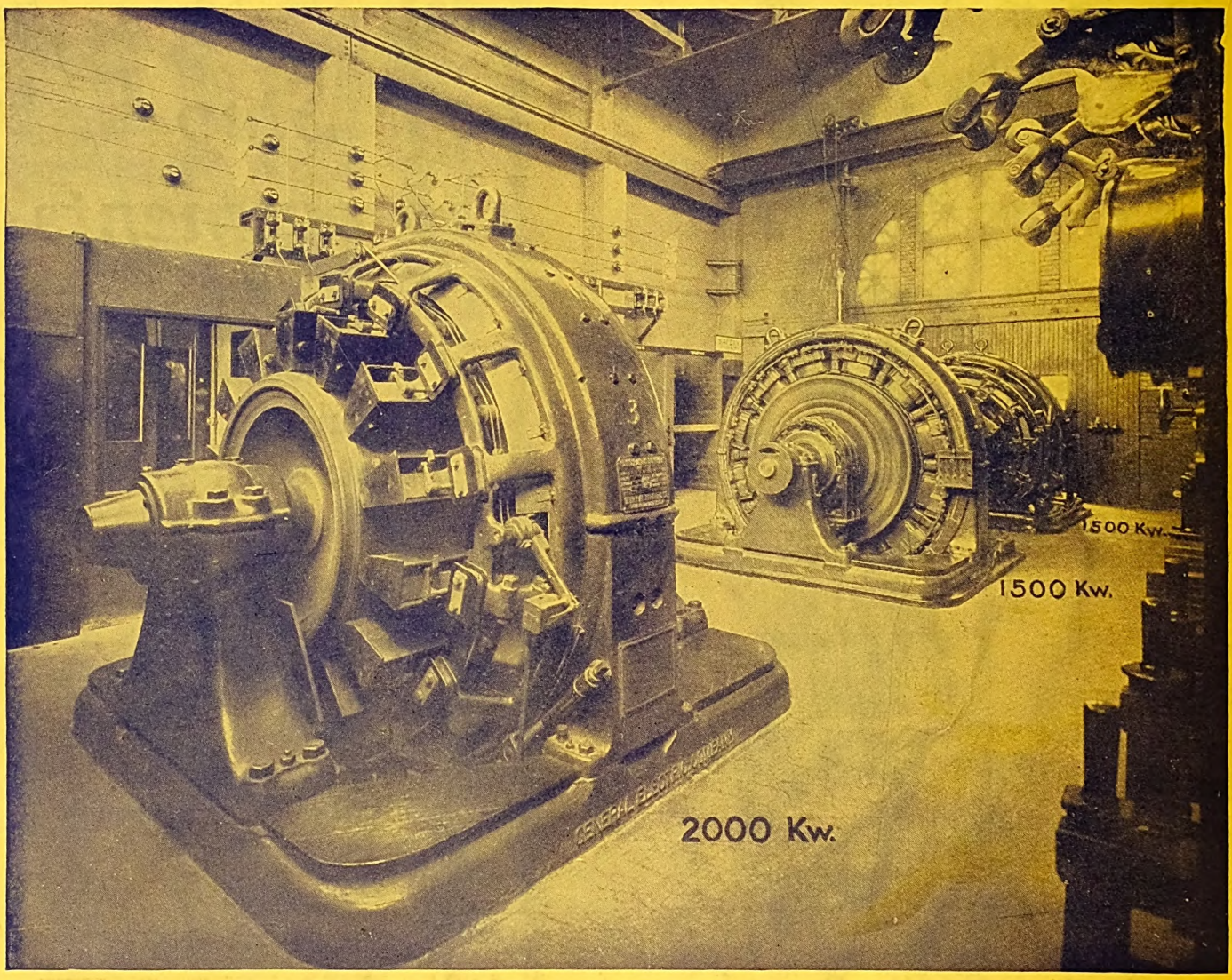

Reliable power back of San Francisco trolleys

The largest converter capacity under one roof on the Pacific Coast is in this substation of the Market Street Railway, at 8th Avenue and Geary Streets, San Francisco. The 2000-kw. unit, incorporating the new features of G-E design, was added to the installation in 1923 after the two 1500-kw. units had been in continuous operation for nine years.

G-E Railway Synchronous Converters are being preferred by railway engineers particularly because of two important features:

RADIAL TYPE BRUSH RIGGING gives maximum space between brush-holders and eliminates all overhanging parts. Where arcs might form, the exposed parts are protected by arc-resistant material.

HIGH-RELUCTANCE COMMUTATING POLES maintain the proper flux to insure commutation under severe load conditions. They enable the converter to withstand many disturbances and prevent service interruption.

3-11

GENERAL ELECTRIC

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ELECTRIC RAILWAY JOURNAL

EE

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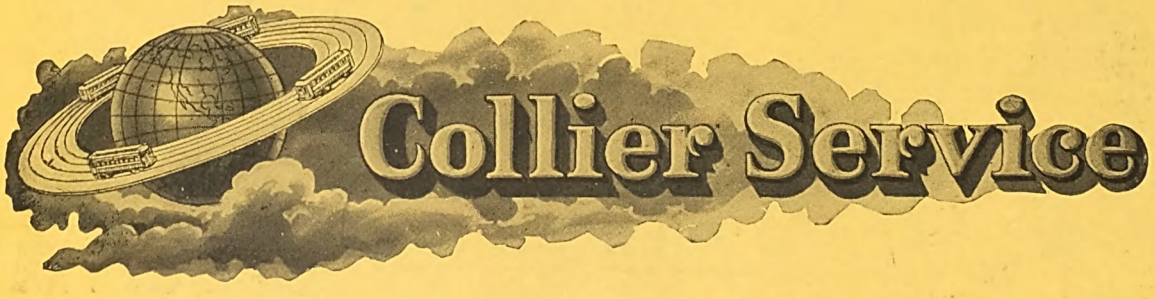

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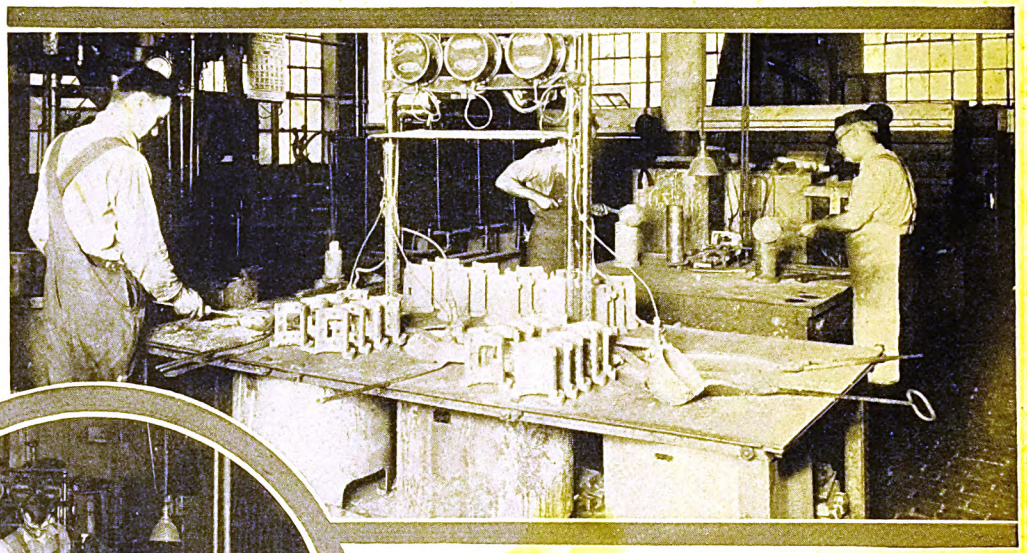


About Babbitting

in its relation to your operating costs

NEXT to inadequate lubrication, faulty babbitting is the greatest source of bearing failures. That is why we also place so much stress upon the babbitting of Westinghouse Specification Bearings.

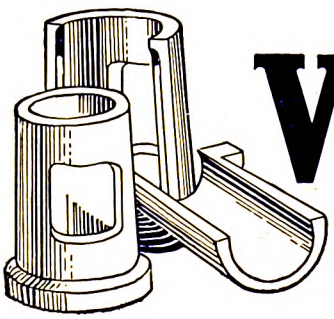
The new Homewood Works is equipped with the most modern appliances for the absolute heat control so essential to good results. Experts, trained to the task, and guided by competent engineers, babbitt the bearings with specially alloyed virgin metals. Machining and milling to correct tolerances assures the accurate fit and easy replacement of Westinghouse bearings.

Westinghouse renewal parts, made from the same patterns and moulds as those on your original Westinghouse motors, contribute to the maximum of economical service from your equipment.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of the United States and Foreign Countries

1926



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Specification **Bearings**

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Bus Seats

Attractively Designed

Appeal to both Operators and Public—

No. 105-A Type

No part of your buses will make a deeper impression upon your passengers than the seating equipment. Consequently, it is of the utmost importance that you specify a type of seat which will insure a favorable impression and help to popularize your service. The No. 105-A illustrated is but one of many Brill types in which attractive appearance, unusual comfort and durability of construction are important characteristics.

No. 1002 Operator's De Luxe Type

The bus operator is your contact with the public. He is your salesman and you are vitally interested in his success. Give him a seat which will appeal to him, and you help his enthusiasm for your line.

The Brill No. 1002 illustrated, mounted on a single pressed steel pedestal, meets the requirements of the most particular. Our seat catalog is No. 284. May we send you a copy?

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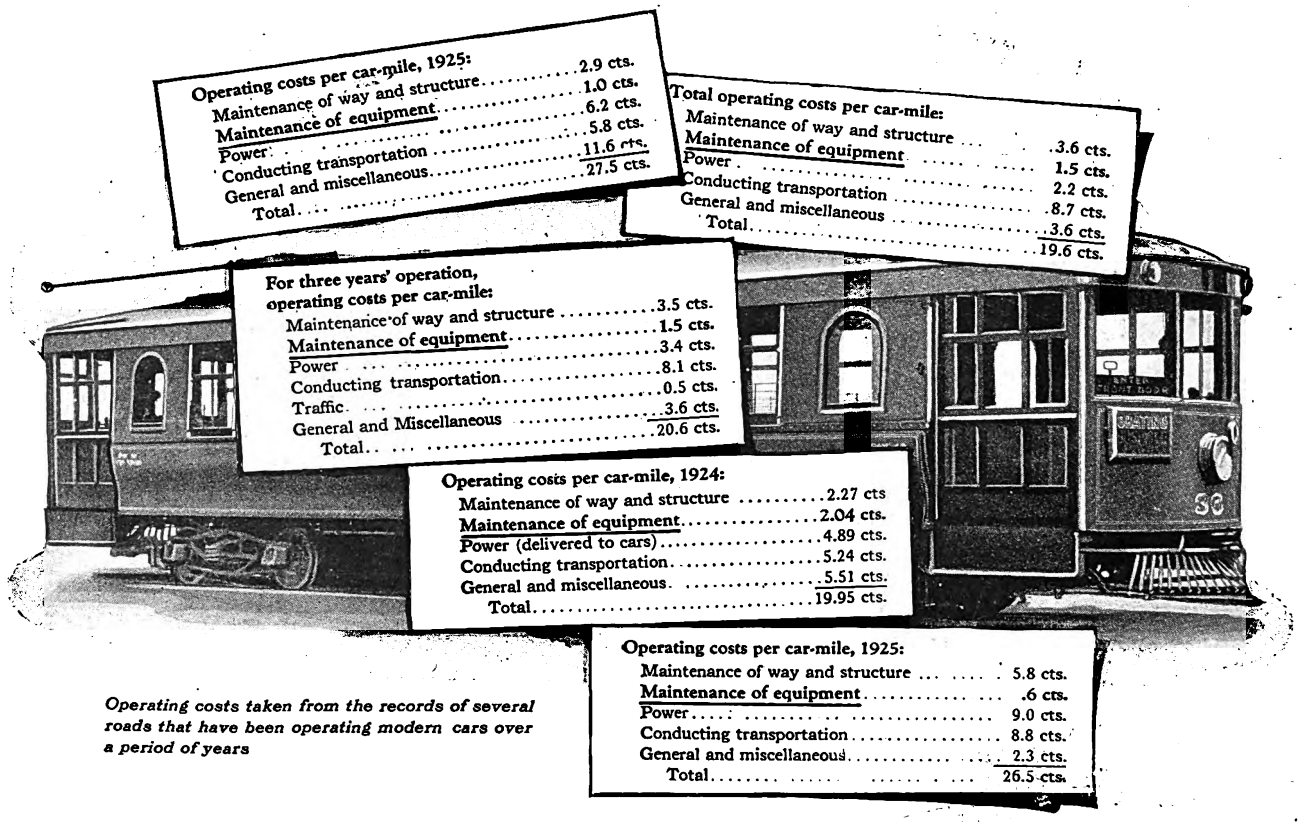

Operating costs taken from the records of several roads that have been operating modern cars over a period of years

Maintenance modernized!

Investigate the item: Maintenance of Equipment, in the operating-cost records of any of the companies that are using modern cars. You will find $2\frac{1}{2}$ cents per car-mile is a high figure; 1 cent per car-mile is common. Some roads report even less.

You may not be able to effect a considerable increase in riding—and gross revenue—in your territory. However, you *can* reduce your operating cost, if your equipment is old, heavy, expensive to maintain. The result is the same —*increased net earnings.*

Surely the light-weight modern car G-E equipped is demonstrating its essentiality for the raising of a railway's operating efficiency.

Talk over with a G-E railway engineering specialist *your* opportunities for increasing earnings or reducing expense. General Electric's recent experience gained by working with other railways will interest you. The nearest G-E District Office is at your service.

11-81

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